SPERC Eurometaux SPERC 1.1v2: Manufacture and recycling of massive metal and metal powder

Author: Eurometaux
Version date: April 2018

Product/substance domain	Metal in the Eurometaux SPERCs is defined in a broad sense. The definition includes alkali metals, alkaline earth metals, transition metals, post-transition metals, metalloids but excludes non-metals, halogens, noble gases and metallo-organic compounds. SPERC valid for metals with solid water partition coefficient for suspended matter between 10,000 L/kg and 400,000 L/kg. This SPERC is valid for massive metal and metallic powder from both primary (derived from ores, concentrates) and secondary raw materials (from indigenous scrap and residues) (and not for inorganic metal compounds). Types of products: The product of the industry is either refined metal (powder) or semis/semi manufactures, i.e. metal cast ingots or wrought shapes, extruded shapes, foil, sheet, strip, rod, etc.
Description of activities/processes	Manufacture and recycling of massive metal or metal powder. This SPERC does not cover mining and ore treatment at the mine site. The range of raw primary and secondary materials available to the various installations is wide and this means that a variety of metallurgical production processes is used: hydrometallurgical and pyrometallurgical processes. The hydrometallurgical winning process with acids and alkalis involves roasting, leaching, purification, electrowinning and electrolysis. The pyrometallurgical winning process involves smelting, roasting, sintering, blast furnacing, electric arc furnacing, condensing and refining/casting. Loading of anodes in tank. Deposition of powder on cathodes. Discharge of powder, washing and drying. Removal of spent anodes. Since metal SPERCs are based on measured data at end-of-pipe on-site, all operations, processes and equipment are integrated in the release fractions from raw materials handling, auxiliary processes, cleaning and maintenance, etc...
Life cycle stage	Manufacture
Chemical product category	
Sector of use	SU 14: Manufacture of basic metals, including alloys
Link to website	http://www.reach-metals.eu/

Conditions of use

Technical and organisational conditions and measures

On site treatment of off-air: Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter

Explanation for the CSR: Direct air emissions should be reduced by implementing one or more of the following RMMs:

• Electrostatic precipitators using wide electrode spacing: 5 – 15 mg/Nm³

• Wet electrostatic precipitators: < 5 mg/Nm³

• Cyclones, but as primary collector: < 50 mg/Nm³

• Fabric or bag filters: high efficiency in controlling fine particulate (melting): achieve emission values < 5mg/Nm³. Membrane filtration techniques can achieve < 1 mg/Nm³

• Ceramic and metal mesh filters. PM10 particles are removed: 0.1 mg/Nm³

Wet scrubbers: < 4 mg/Nm

For ES for communication: *Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter*

On site treatment of wastewater: Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange

Explanation for the CSR: Following IPPC-BREF note document, the treatment methods are very much dependent on the specific processes and the metals involved. Direct water emissions should be reduced by implementing one or more of the following RMMs:
• Chemical precipitation: used primarily to remove the metal ions (e.g. Ca(OH)2, pH 11 precipitation: >99% removal efficiency; Fe(OH)3, pH 11: 96% removal efficiency)
• Sedimentation (e.g. Na2S, pH 11, >99% removal efficiency) • Filtration: used as final clarification step (e.g. ultrafiltration, pH 5.1: 93% removal efficiency, nanofiltration: 97% removal efficiency, reverse osmosis, pH 4-11: 99% removal efficiency)
"• Electrolysis: for low metal concentration (e.g. electrodialysis: 13% removal efficiency within 2 hours at 2g/L, membrane electrolysis, electrochemical precipitation, pH 4-10, >99% removal efficiency) • Reverse osmosis: extensively used for the removal of dissolved metals Ion exchange: final cleaning step in the removal of heavy metal from process wastewater (e.g. 90% removal efficiency for clinoptinolite and 100% removal efficiency for synthetic zeolite) More information can be found in EC (2001), Integrated Pollution Prevention and Control (IPCC): reference document on Best Available Techniques in the Non Ferrous Metals Industries.
For ES for communication: *Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange*

Indoor/outdoor use: Covers indoor and outdoor use
Explanation for the CSR: -
For ES for communication: Covers indoor and outdoor use.

Conditions and measures related to biological sewage treatment plant

Discharge rate of STP >= 2E3 m3/day
Explanation for the CSR: -
For ES for communication: Assumed domestic sewage treatment plant flow >= 2E3 m3/day

Biological STP : Site specific [Effectiveness Water: -%]
Explanation for the CSR: -
For ES for communication: Provide onsite wastewater removal efficiency of %

Application of the STP sludge on agricultural soil: No
Explanation for the CSR: -
For ES for communication: No application of sewage sludge to soil

Conditions and measures related to external treatment of waste (including article waste)

Particular considerations on the waste treatment operations: No (low concentration)
Explanation for the CSR: Particular risks from waste treatment unlikely due low concentration of substance in waste stream. Waste disposal according to national/local legislation is sufficient. If the metal content of the waste is elevated enough, internal or external recovery/recycling is considered.
For ES for communication: Dispose of waste product or used containers according to local regulations.

Use amounts

Daily use amount at a site (tonnes/day): -
Default assessment use rate as set by ERC 1. It is recommended to use a realistic substance use rate.
For ES for communication: Daily amount per site <= tonnes/day

Extrapolation factor for annual use amount: 218
Default number of emission days is derived from a multi-metal background database of measured site-specific release factors collected under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. 218 days/year s the 10th percentile of reported site-specific number of emission days for 121 sites from production of massive metal and metal powder.

Explanations for the release factors valid for all the sub-SPERCs

Releases to water: See background document. Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. Most data were collected under national and regional environmental legislations. Values derived from realistic worst-case regression line (RF = 10^(0.043 – 0.915 x log(Kd)) of the metal-specific 90th percentile reported site-specific release factors to wastewater for 142 sites from the production of massive metal and metal powder.

Releases to air: See background document. Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. Most data

were collected under national and regional environmental legislations. Value is the 90th percentile of reported site-specific release factors to air for 111 sites from the production of massive metal and metal powder.

Releases to non agricultural soil: ERC default

Releases to waste: Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The 90th percentile of reported site-specific release factors to solid waste for 62 manufacturing sites covering zinc, nickel, lead, cobalt, cadmium, antimony

Sub-SPERC: Eurometaux SPERC 1.1b.v2 Kd 10000-25000 L/kg

Sub-SPERC applicability	
Environmental release category	ERC 1

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.03	0.03	0.01	2.3

Sub-SPERC: Eurometaux SPERC 1.1c.v2 Kd 25000-60000 L/kg

Sub-SPERC applicability	
Environmental release category	ERC 1

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.01	0.03	0.01	2.3

Sub-SPERC: Eurometaux SPERC 1.1d.v2 Kd 60000-190000 L/kg

Sub-SPERC applicability	
Environmental release category	ERC 1

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.005	0.03	0.01	2.3

Sub-SPERC: Eurometaux SPERC 1.1e.v2 Kd 190000-400000 L/kg

Sub-SPERC applicability	
Environmental release category	ERC 1

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.002	0.03	0.01	2.3

Chesar version: 2.3
Chesar SPERC modification date: 05/04/2019

SPERC Eurometaux SPERC 1.2.v2: Manufacture of metal compounds

Author: Eurometaux
Version date: April 2018

Product/substance domain	Limitations of coverage compared to ERC relate to: User groups: Manufacture of metal compounds. This SPERC does not cover production of organic or metallo-organic substances and mining and ore treatment at the mine site and producers of massive metal. Substance groups or functions: Release defaults are derived from measured emissions. Metal representativeness of background data: Metal (compound) is defined here in a broad sense. The definition includes alkali metals, alkaline earth metals, transition metals, post-transition metals, metalloids and their compounds but excludes non-metals, halogens, noble gases and metallo-organic compounds. SPERC valid for metals with solid water partition coefficient for suspended matter between 1,000 L/kg and 400,000 L/kg. Types of products: Metal compound
Description of activities/processes	Since metal SPERCs are based on measured data at end-of-pipe on-site, all indicated PROCs are integrated in the release fractions from raw materials handling to cleaning and maintenance.
Life cycle stage	Manufacture
Chemical product category	
Sector of use	SU 14: Manufacture of basic metals, including alloys
Link to website	http://www.reach-metals.eu/

Conditions of use

Technical and organisational conditions and measures

On site treatment of off-air: Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter
Explanation for the CSR: Direct air emissions should be reduced by implementing one or more of the following RMMs:
• Electrostatic precipitators using wide electrode spacing: 5 – 15 mg/Nm³
• Wet electrostatic precipitators: < 5 mg/Nm³
• Cyclones, but as primary collector: < 50 mg/Nm³
• Fabric or bag filters: high efficiency in controlling fine particulate (melting): achieve emission values < 5mg/Nm³. Membrane filtration techniques can achieve < 1 mg/Nm³
• Ceramic and metal mesh filters. PM10 particles are removed: 0.1 mg/Nm³
Wet scrubbers: < 4 mg/Nm
For ES for communication: *Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter*

On site treatment of wastewater: Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange
Explanation for the CSR: Following IPPC-BREF note document, the treatment methods are very much dependent on the specific processes and the metals involved. Direct water emissions should be reduced by implementing one or more of the following RMMs:
• Chemical precipitation: used primarily to remove the metal ions (e.g. Ca(OH)2, pH 11 precipitation: >99% removal efficiency; Fe(OH)3, pH 11: 96% removal efficiency)
• Sedimentation (e.g. Na2S, pH 11, >99% removal efficiency) • Filtration: used as final clarification step (e.g. ultrafiltration, pH 5.1: 93% removal efficiency, nanofiltration: 97% removal efficiency, reverse osmosis, pH 4-11: 99% removal efficiency)
"• Electrolysis: for low metal concentration (e.g. electrodialysis: 13% removal efficiency within 2 hours at 2g/L, membrane electrolysis, electrochemical precipitation, pH 4-10, >99% removal efficiency) • Reverse osmosis: extensively used for the removal of dissolved metals Ion exchange: final cleaning step in the removal of heavy metal from process wastewater (e.g. 90% removal efficiency for clinoptinolite and 100% removal

efficiency for synthetic zeolite) More information can be found in EC (2001), Integrated Pollution Prevention and Control (IPCC): reference document on Best Available Techniques in the Non Ferrous Metals Industries.
For ES for communication: *Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange*

Conditions and measures related to biological sewage treatment plant

Discharge rate of STP >= 2E3 m3/day
Explanation for the CSR: -
For ES for communication: Assumed domestic sewage treatment plant flow >= 2E3 m3/day

Biological STP : Site specific [Effectiveness Water: -%]
Explanation for the CSR: -
For ES for communication: Provide onsite wastewater removal efficiency of %

Application of the STP sludge on agricultural soil: No
Explanation for the CSR: -
For ES for communication: No application of sewage sludge to soil

Conditions and measures related to external treatment of waste (including article waste)

Particular considerations on the waste treatment operations: No (low concentration)
Explanation for the CSR: Particular risks from waste treatment unlikely due low concentration of substance in waste stream. Waste disposal according to national/local legislation is sufficient. If the metal content of the waste is elevated enough, internal or external recovery/recycling is considered.
For ES for communication: Dispose of waste product or used containers according to local regulations.

Use amounts

Daily use amount at a site (tonnes/day): -
Default assessment use rate as set by ERC 1. It is recommended to use a realistic substance use rate.
For ES for communication: Daily amount per site <= tonnes/day

Extrapolation factor for annual use amount: 182
Default number of emission days are derived from a multi-metal background database of measured site-specific release factors collected under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. 182 days/year is the 10th percentile of reported site-specific number of emission days for 168 sites from production of metal compounds.

Explanations for the release factors valid for all the sub-SPERCs

Releases to non agricultural soil: ERC default

Sub-SPERC: Eurometaux SPERC 1.2b.v2 Kd 1000-10000 L/kg

Sub-SPERC applicability

Environmental release category	ERC 1

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.2	0.03	0.01	2.3

Explanations specific to the Sub-SPERC

Releases to water:
After on-site STP. Reasonable worst-case (90th percentile) (available data too limited to develop robust regression). A relationship between solid-water partitioning coefficient for suspended matter Kd and the release factor to water can be justified because the Kd expresses the distribution between aqueous phase and suspended matter. Kd is an important parameter impacting the removal efficiency especially in sedimentation and precipitation RMMs but also in on-site runoff, cleaning operations, wet processes, etc

Releases to air:
Release after RMM. The 90th percentile of reported site-specific release factors to air for 145 sites from the production of massive metal and metal powder

Releases to waste:

The 90th percentile of reported site-specific release factors to solid waste for 62 manufacturing sites covering zinc, nickel, lead, cobalt, cadmium, antimony

Sub-SPERC: Eurometaux SPERC 1.2c.v2 Kd 10000-25000 L/kg

Sub-SPERC applicability

Environmental release category	ERC 1

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.2	0.03	0.01	2.3

Explanations specific to the Sub-SPERC

Releases to water:
After on-site STP. Realistic worst-case regression line (RF = 10^(1.59 – 1.14 x log(Kd)) of the metal-specific 90th percentile reported site- specific release factors to wastewater for 201 sites from the production of massive metal and metal powder. A relationship between solid-water partitioning coefficient for suspended matter Kd and the release factor to water can be justified because the Kd expresses the distribution between aqueous phase and suspended matter. Kd is an important parameter impacting the removal efficiency especially in sedimentation and precipitation RMMs but also in on-site runoff, cleaning operations, wet processes, etc

Releases to air:
Release after RMM. The 90th percentile of reported site-specific release factors to air for 145 sites from the production of massive metal and metal powder

Releases to waste:
The 90th percentile of reported site-specific release factors to solid waste for 62 manufacturing sites covering zinc, nickel, lead, cobalt, cadmium, antimony

Sub-SPERC: Eurometaux SPERC 1.2d.v2 Kd 25000-60000 L/kg

Sub-SPERC applicability

Environmental release category	ERC 1

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.04	0.03	0.01	2.3

Explanations specific to the Sub-SPERC

Releases to water:
After on-site STP. Realistic worst-case regression line (RF = 10^(1.59 – 1.14 x log(Kd)) of the metal-specific 90th percentile reported site- specific release factors to wastewater for 201 sites from the production of massive metal and metal powder. A relationship between solid-water partitioning coefficient for suspended matter Kd and the release factor to water can be justified because the Kd expresses the distribution between aqueous phase and suspended matter. Kd is an important parameter impacting the removal efficiency especially in sedimentation and precipitation RMMs but also in on-site runoff, cleaning operations, wet processes, etc

Releases to air:
Release after RMM. The 90th percentile of reported site-specific release factors to air for 145 sites from the production of massive metal and metal powder

Releases to waste:
The 90th percentile of reported site-specific release factors to solid waste for 62 manufacturing sites covering zinc, nickel, lead, cobalt, cadmium, antimony

Sub-SPERC: Eurometaux SPERC 1.2e.v2 Kd 60000-100000 L/kg

Sub-SPERC applicability

Environmental release category	ERC 1

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.01	0.03	0.01	2.3

Explanations specific to the Sub-SPERC

Releases to water:
After on-site STP. Realistic worst-case regression line (RF = 10^(1.59 – 1.14 x log(Kd)) of the metal-specific 90th percentile reported site- specific release factors to wastewater for 201 sites from the production of massive metal and metal powder. A relationship between solid-water partitioning coefficient for suspended matter Kd and the release factor to water can be justified because the Kd expresses the distribution between aqueous phase and suspended matter. Kd is an important parameter impacting the removal efficiency especially in sedimentation and precipitation RMMs but also in on-site runoff, cleaning operations, wet processes, etc

Releases to air:
Release after RMM. The 90th percentile of reported site-specific release factors to air for 145 sites from the production of massive metal and metal powder

Releases to waste:
The 90th percentile of reported site-specific release factors to solid waste for 62 manufacturing sites covering zinc, nickel, lead, cobalt, cadmium, antimony

Sub-SPERC: Eurometaux SPERC 1.2f.v2 Kd 100000-190000 L/kg

Sub-SPERC applicability

Environmental release category	ERC 1

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.005	0.03	0.01	2.3

Explanations specific to the Sub-SPERC

Releases to water:
After on-site STP. Realistic worst-case regression line (RF = 10^(1.59 – 1.14 x log(Kd)) of the metal-specific 90th percentile reported site- specific release factors to wastewater for 201 sites from the production of massive metal and metal powder. A relationship between solid-water partitioning coefficient for suspended matter Kd and the release factor to water can be justified because the Kd expresses the distribution between aqueous phase and suspended matter. Kd is an important parameter impacting the removal efficiency especially in sedimentation and precipitation RMMs but also in on-site runoff, cleaning operations, wet processes, etc

Releases to air:
Release after RMM. The 90th percentile of reported site-specific release factors to air for 145 sites from the production of massive metal and metal powder

Releases to waste:
The 90th percentile of reported site-specific release factors to solid waste for 62 manufacturing sites covering zinc, nickel, lead, cobalt, cadmium, antimony

Sub-SPERC: Eurometaux SPERC 1.2g.v2 Kd 190000-250000 L/kg

Sub-SPERC applicability			
Environmental release category	ERC 1		
Release factors			
To water (%)	**To air (%)**	**To non agricultural soil (%)**	**To waste (%)**
0.002	0.03	0.01	2.3

Explanations specific to the Sub-SPERC

Releases to water:
After on-site STP. Realistic worst-case regression line (RF = 10^(1.59 – 1.14 x log(Kd)) of the metal-specific 90th percentile reported site- specific release factors to wastewater for 201 sites from the production of massive metal and metal powder. A relationship between solid-water partitioning coefficient for suspended matter Kd and the release factor to water can be justified because the Kd expresses the distribution between aqueous phase and suspended matter. Kd is an important parameter impacting the removal efficiency especially in sedimentation and precipitation RMMs but also in on-site runoff, cleaning operations, wet processes, etc

Releases to air:
Release after RMM. The 90th percentile of reported site-specific release factors to air for 145 sites from the production of massive metal and metal powder

Releases to waste:
The 90th percentile of reported site-specific release factors to solid waste for 62 manufacturing sites covering zinc, nickel, lead, cobalt, cadmium, antimony

Sub-SPERC: Eurometaux SPERC 1.2h.v2 Kd 250000-400000 L/kg

Sub-SPERC applicability			
Environmental release category	ERC 1		
Release factors			
To water (%)	**To air (%)**	**To non agricultural soil (%)**	**To waste (%)**
0.001	0.03	0.01	2.3

Explanations specific to the Sub-SPERC

Releases to water:
After on-site STP. Realistic worst-case regression line (RF = 10^(1.59 – 1.14 x log(Kd)) of the metal-specific 90th percentile reported site- specific release factors to wastewater for 201 sites from the production of massive metal and metal powder. A relationship between solid-water partitioning coefficient for suspended matter Kd and the release factor to water can be justified because the Kd expresses the distribution between aqueous phase and suspended matter. Kd is an important parameter impacting the removal efficiency especially in sedimentation and precipitation RMMs but also in on-site runoff, cleaning operations, wet processes, etc

Releases to air:
Release after RMM. The 90th percentile of reported site-specific release factors to air for 145 sites from the production of massive metal and metal powder

Releases to waste:
The 90th percentile of reported site-specific release factors to solid waste for 62 manufacturing sites covering zinc, nickel, lead, cobalt, cadmium, antimony

Chesar version: 2.3
Chesar SPERC modification date: 05/04/2019

SPERC Eurometaux SPERC 10A.1.v1: Service life of constructions of massive metal, alloys or metallic coating, outdoor

Author: Eurometaux
Version date: April 2018

Product/substance domain	Metal in the Eurometaux SPERCs is defined in a broad sense. The definition includes alkali metals, alkaline earth metals, transition metals, post-transition metals, metalloids but excludes non-metals, halogens, noble gases and metallo-organic compounds. This SPERC is valid for metallic metal, alloys or metallic coating.
Description of activities/processes	Service life of outdoor buildings and constructions
Life cycle stage	Service life (consumers)
Chemical product category	
Sector of use	
Use in: Non agriculture	
Link to website	http://www.reach-metals.eu/

Conditions of use

Conditions and measures related to external treatment of waste (including article waste)

Particular considerations on the waste treatment operations: Dedicated recollection infrastructure required
Explanation for the CSR: -
For ES for communication: Dedicated recollection infrastructure required for waste

Other conditions affecting environmental exposure

Place of use: Outdoor
Explanation for the CSR: -
For ES for communication: Outdoor use

Water contact during use: Yes
Explanation for the CSR: -
For ES for communication: -

Biological STP : Standard [Effectiveness Water: -%]
Explanation for the CSR: -
For ES for communication: Municipal sewage treatment plant is assumed.

Use amounts

Local daily fraction of regional tonnage for the use (widespread): 5.5E-6

Explanations for the release factors valid for all the sub-SPERCs

Releases to water: Realistic worst-case value based a literature study with runoff data and emission rates from metallic roofs of Cu, Zn, Pb, Cr, Al, Ni (in steel). A service life of 25 years was assumed. See background document for more information.

Releases to air: Metals and metal compounds do not volatilise. Due to the massive physical state in service life, there is no dust formation that can become air-borne.

Releases to non agricultural soil: Realistic worst-case value based a literature study with runoff data and emission rates from metallic roofs of Cu, Zn, Pb, Cr, Al, Ni (in steel). A service life of 25 years was assumed. See background document for more information.

Releases to waste: Metals are permanent materials which can be recycled again and again, keeping their value in the European economy. There is currently in the EU 90% recycling rate from buildings, leaving 10% available for release to waste.

Sub-SPERC: Eurometaux SPERC 10A.1.v1 Service life of constructions of massive metal,

alloys or metallic coating, outdoor			
Sub-SPERC applicability			
Environmental release category	ERC 10a		
Release factors			
To water (%)	**To air (%)**	**To non agricultural soil (%)**	**To waste (%)**
1.25	0	1.25	10

Chesar version: 1.0
Chesar SPERC modification date: 05/04/2019

SPERC Eurometaux SPERC 11A.2.v1: Service life of batteries, indoor/outdoor

Author: Eurometaux
Version date: April 2018

Product/substance domain	Metal in the Eurometaux SPERCs is defined in a broad sense. The definition includes alkali metals, alkaline earth metals, transition metals, post-transition metals, metalloids but excludes non-metals, halogens, noble gases and metallo-organic compounds.
Description of activities/processes	Service life of batteries, indoor/outdoor
Life cycle stage	Service life (consumers)
Chemical product category	
Sector of use	
Use in: Non agriculture	
Link to website	http://www.reach-metals.eu/

Conditions of use

Conditions and measures related to external treatment of waste (including article waste)

Particular considerations on the waste treatment operations: Dedicated recollection infrastructure required
Explanation for the CSR: -
For ES for communication: Dedicated recollection infrastructure required for waste

Other conditions affecting environmental exposure

Place of use: Indoor/Outdoor
Explanation for the CSR: -
For ES for communication: Indoor/Outdoor use

Water contact during use: No
Explanation for the CSR: -
For ES for communication: No water contact during use.

Biological STP : Standard [Effectiveness Water: -%]
Explanation for the CSR: -
For ES for communication: Municipal sewage treatment plant is assumed.

Use amounts

Local daily fraction of regional tonnage for the use (widespread): 5.5E-6

Explanations for the release factors valid for all the sub-SPERCs

Releases to water: There is no release to water because batteries are closed containers during service life, there is no leaking during service life and accidental release is not to be considered (ECHA Guidance R.16, Feb 2016, p. 171-172: no losses during explosion or car accidents)

Releases to air: Metals and metal compounds do not volatile. Due to the massive physical state in service life and the containment in a battery, there is no dust formation that can become air-borne.

Releases to non agricultural soil: ERC default: not applicable

Releases to waste: The EU Batteries and Accumulators Directive requires the following targets to be met: - a 45% collection rate for waste portable batteries to be met by September 2016; - a prohibition on the disposal by landfill or incineration of waste industrial and automotive batteries in effect setting a 100% collection and recycling target; and - the setting of recycling efficiencies to ensure that a high proportion of the weight of waste batteries is recycled (65% of lead acid batteries, 75% of nickel-cadmium batteries and 50% of other waste batteries). In practice, the recycling rates are larger. The EU automotive lead-based battery collection and recycling rate for the period 2010/2012 is 99% (Eurobat, ILA, ACEA). Portable battery collection varies in the EU between 19% and 71% for the year 2015 with an average around 40% (EPBA). Given that battery

recycling rates have further increased since then and will further increase in the future (given the regulatory and economic drivers), a reasonable recycling rate of 80% and a potential release fraction of 20% to solid waste is assumed.

Sub-SPERC: Eurometaux SPERC 11A.2.v1 Service life of batteries, indoor/outdoor

Sub-SPERC applicability	
Environmental release category	ERC 11a

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0	0	0	20

Chesar version: 1.0
Chesar SPERC modification date: 04/12/2018

SPERC Eurometaux SPERC 11A.3.v1: Service life of metallic articles with no emission

Author: Eurometaux
Version date: April 2018

Product/substance domain	Metal in the Eurometaux SPERCs is defined in a broad sense. The definition includes alkali metals, alkaline earth metals, transition metals, post-transition metals, metalloids but excludes non-metals, halogens, noble gases and metallo-organic compounds. Products are metallic articles with no contact to water: electronic and electric devices such as screens, monitors, IT and telecommunication equipment (e.g. mobile phone), large household appliances, small household appliances, photovoltaic cells, outdoor air conditioning, vehicles, etc... Products that are NOT included are brake pads, tyres, monitoring instruments.
Description of activities/processes	Service life of metallic articles with no emission
Life cycle stage	Service life (consumers)
Chemical product category	
Sector of use	
Use in: Non agriculture	
Link to website	http://www.reach-metals.eu/

Conditions of use

Conditions and measures related to external treatment of waste (including article waste)
Particular considerations on the waste treatment operations: Dedicated recollection infrastructure required Explanation for the CSR: - For ES for communication: Dedicated recollection infrastructure required for waste
Other conditions affecting environmental exposure
Place of use: Indoor Explanation for the CSR: - For ES for communication: Indoor use
Water contact during use: No Explanation for the CSR: - For ES for communication: No water contact during use.
Biological STP : Standard [Effectiveness Water: -%] Explanation for the CSR: - For ES for communication: Municipal sewage treatment plant is assumed.
Use amounts
Local daily fraction of regional tonnage for the use (widespread): 5.5E-6
Explanations for the release factors valid for all the sub-SPERCs
Releases to water: Metal in either encapsulated / there is a mechanical barrier (to avoid direct contact with water) or there is no intended contact with water because incompatible with water (because this would lead to disfunctioning of the article) AND there is no abrasion of the article
Releases to air: Metals and metal compounds do not volatilise. Due to the massive physical state in service life, there is no dust formation that can become air-borne.
Releases to non agricultural soil: ERC default: not applicable
Releases to waste: Recycling rates for WEEE in the EU was in 2016 46% (range between 30% and 96%) (Eurostat). Potential fraction for solid waste is then 54%.

Sub-SPERC: Eurometaux SPERC 11A.3.v1 Service life of metallic articles with no emission

Sub-SPERC applicability			
Environmental release category	ERC 11a		
Release factors			
To water (%)	**To air (%)**	**To non agricultural soil (%)**	**To waste (%)**
0	0	0	54

Chesar version: 1.0
Chesar SPERC modification date: 05/04/2019

SPERC Eurometaux SPERC 3.1.v2: Formulation of massive metal or metal powder in alloys

Author: Eurometaux
Version date: April 2018

Product/substance domain	Limitations of coverage compared to ERC relate to: User groups: Alloying of massive metal or metal powder into alloys (special preparations). Substance groups or functions: Release defaults are derived from measured emissions. Metal representativeness of background data: Metal (compound) is defined here in a broad sense. The definition includes alkali metals, alkaline earth metals, transition metals, post-transition metals, metalloids and their compounds but excludes non-metals, halogens, noble gases and metallo-organic compounds. SPERC valid for metals with solid water partition coefficient for suspended matter between 2,500 L/kg and 400,000 L/kg. Types of products: Metal (massive and/or powder)
Description of activities/processes	Since metal SPERCs are based on measured data at end-of-pipe on-site, all indicated PROCs are integrated in the release fractions from raw materials handling to cleaning and maintenance.
Life cycle stage	Formulation or re-packing
Chemical product category	PC 7: Base metals and alloys
Sector of use	SU 14: Manufacture of basic metals, including alloys
Link to website	http://www.reach-metals.eu/

Conditions of use

Technical and organisational conditions and measures

On site treatment of wastewater: Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange

Explanation for the CSR: Following IPPC-BREF note document, the treatment methods are very much dependent on the specific processes and the metals involved. Direct water emissions should be reduced by implementing one or more of the following RMMs:

• Chemical precipitation: used primarily to remove the metal ions (e.g. Ca(OH)2, pH 11 precipitation: >99% removal efficiency; Fe(OH)3, pH 11: 96% removal efficiency)

• Sedimentation (e.g. Na2S, pH 11, >99% removal efficiency) • Filtration: used as final clarification step (e.g. ultrafiltration, pH 5.1: 93% removal efficiency, nanofiltration: 97% removal efficiency, reverse osmosis, pH 4-11: 99% removal efficiency)

"• Electrolysis: for low metal concentration (e.g. electrodialysis: 13% removal efficiency within 2 hours at 2g/L, membrane electrolysis, electrochemical precipitation, pH 4-10, >99% removal efficiency) • Reverse osmosis: extensively used for the removal of dissolved metals Ion exchange: final cleaning step in the removal of heavy metal from process wastewater (e.g. 90% removal efficiency for clinoptinolite and 100% removal efficiency for synthetic zeolite) More information can be found in EC (2001), Integrated Pollution Prevention and Control (IPCC): reference document on Best Available Techniques in the Non Ferrous Metals Industries.

For ES for communication: *Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange*

On site treatment of off-air: Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter

Explanation for the CSR: Direct air emissions should be reduced by implementing one or more of the following RMMs:

• Electrostatic precipitators using wide electrode spacing: 5 – 15 mg/Nm³

• Wet electrostatic precipitators: < 5 mg/Nm³

• Cyclones, but as primary collector: < 50 mg/Nm³

• Fabric or bag filters: high efficiency in controlling fine particulate (melting): achieve emission values < 5mg/Nm³. Membrane filtration techniques can achieve < 1 mg/Nm³

• Ceramic and metal mesh filters. PM10 particles are removed: 0.1 mg/Nm³

Wet scrubbers: < 4 mg/Nm

For ES for communication: *Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter*

Conditions and measures related to biological sewage treatment plant

Biological STP : Site specific [Effectiveness Water: -%]
Explanation for the CSR: -
For ES for communication: Provide onsite wastewater removal efficiency of %

Discharge rate of STP >= 2E3 m3/day
Explanation for the CSR: -
For ES for communication: Assumed domestic sewage treatment plant flow >= 2E3 m3/day

Application of the STP sludge on agricultural soil: No
Explanation for the CSR: -
For ES for communication: No application of sewage sludge to soil

Conditions and measures related to external treatment of waste (including article waste)

Particular considerations on the waste treatment operations: No (low concentration)
Explanation for the CSR: Particular risks from waste treatment unlikely due low concentration of substance in waste stream. Waste disposal according to national/local legislation is sufficient. If the metal content of the waste is elevated enough, internal or external recovery/recycling is considered.
For ES for communication: Dispose of waste product or used containers according to local regulations.

Use amounts

Daily use amount at a site (tonnes/day): -
The substance use rate are the assessment defaults as set by ERC 2. It is recommended to use a realistic substance use rate.
For ES for communication: Daily amount per site <= tonnes/day

Extrapolation factor for annual use amount: 225
This is the 10th percentile of reported site-specific number of emission days for 83 sites. Default number of emission days are derived from a multi-metal background database of measured site-specific release factors collected under the former Directive of New and Existing Substances and REACH 2010 registration dossiers.

Sub-SPERC: Eurometaux SPERC 3.1.v2 Formulation of massive metal or metal powder in alloys

Sub-SPERC applicability

Environmental release category	ERC 3

Additional information on applicability domain: SPERC valid for metals with solid water partition coefficient for suspended matter between 2,500 L/kg and 400,000 L/kg.

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.005	0.005	0.1	1

Explanations specific to the Sub-SPERC

Releases to water:
Release after RMM. Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers: the 90th percentile of reported site-specific release factors to water for 73 sites from the production of alloys

Releases to air:
Release after RMM. Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers: The 90th percentile of reported site-specific release factors to air for 71 sites from the production of alloys

Releases to non agricultural soil:

ERC default
Releases to waste: Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The 90th percentile of reported site-specific release factors to solid waste for 32 downstream user sites covering zinc, nickel, lead, antimony

Chesar version: 2.3
Chesar SPERC modification date: 05/04/2019

SPERC Eurometaux SPERC 5.1.v2: Industrial use of metals and metal compounds in metallic coating

Author: Eurometaux
Version date: April 2018

Product/substance domain	Limitations of coverage compared to ERC relate to: User groups: Industrial use of metals and metal compounds in plating, galvanising. Substance groups or functions: Release defaults are derived from measured emissions. Metal representativeness of background data: Metal (compound) is defined here in a broad sense. The definition includes alkali metals, alkaline earth metals, transition metals, post-transition metals, metalloids and their compounds but excludes non-metals, halogens, noble gases and metallo-organic compounds. SPERC valid for metals with solid water partition coefficient for suspended matter between 25,000 L/kg and 400,000 L/kg. Types of products: Metal and/or metal compounds
Description of activities/processes	Since metal SPERCs are based on measured data at end-of-pipe on-site, all indicated PROCs are integrated in the release fractions from raw materials handling to cleaning and maintenance. A distinction can be made between hot dip batch process, continuous hot dip process and continuous electroplating process. Electroplating is a plating process that uses electrical current to reduce cations of a desired material from a solution and coat a conductive object with a thin layer of the material, such as a metal. Mechanical milling to remove oxide layers. Pickling. Chemical treatment or blasting of internal tube surfaces. Cleaning and stain removal. Polishing. Pre-patination. Raw materials handling and storing of produced substances are also included in this SPERC.
Life cycle stage	Use at industrial sites
Chemical product category	
Sector of use	SU 14: Manufacture of basic metals, including alloys
Link to website	http://www.reach-metals.eu/

Conditions of use

Technical and organisational conditions and measures

On site treatment of off-air: Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter
Explanation for the CSR: Direct air emissions should be reduced by implementing one or more of the following RMMs:
• Electrostatic precipitators using wide electrode spacing: 5 – 15 mg/Nm³
• Wet electrostatic precipitators: < 5 mg/Nm³
• Cyclones, but as primary collector: < 50 mg/Nm³
• Fabric or bag filters: high efficiency in controlling fine particulate (melting): achieve emission values < 5mg/Nm³. Membrane filtration techniques can achieve < 1 mg/Nm³
• Ceramic and metal mesh filters. PM10 particles are removed: 0.1 mg/Nm³
Wet scrubbers: < 4 mg/Nm
For ES for communication: *Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter*

On site treatment of wastewater: Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange
Explanation for the CSR: Following IPPC-BREF note document, the treatment methods are very much dependent on the specific processes and the metals involved. Direct water emissions should be reduced by implementing one or more of the following RMMs:
• Chemical precipitation: used primarily to remove the metal ions (e.g. Ca(OH)2, pH 11 precipitation: >99% removal efficiency; Fe(OH)3, pH 11: 96% removal efficiency)
• Sedimentation (e.g. Na2S, pH 11, >99% removal efficiency) • Filtration: used as final clarification step (e.g.

ultrafiltration, pH 5.1: 93% removal efficiency, nanofiltration: 97% removal efficiency, reverse osmosis, pH 4-11: 99% removal efficiency)
"• Electrolysis: for low metal concentration (e.g. electrodialysis: 13% removal efficiency within 2 hours at 2g/L, membrane electrolysis, electrochemical precipitation, pH 4-10, >99% removal efficiency) • Reverse osmosis: extensively used for the removal of dissolved metals Ion exchange: final cleaning step in the removal of heavy metal from process wastewater (e.g. 90% removal efficiency for clinoptinolite and 100% removal efficiency for synthetic zeolite) More information can be found in EC (2001), Integrated Pollution Prevention and Control (IPCC): reference document on Best Available Techniques in the Non Ferrous Metals Industries.
For ES for communication: *Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange*

Conditions and measures related to biological sewage treatment plant

Biological STP : Site specific [Effectiveness Water: -%]
Explanation for the CSR: -
For ES for communication: Provide onsite wastewater removal efficiency of %

Discharge rate of STP >= 2E3 m3/day
Explanation for the CSR: -
For ES for communication: Assumed domestic sewage treatment plant flow >= 2E3 m3/day

Application of the STP sludge on agricultural soil: No
Explanation for the CSR: -
For ES for communication: No application of sewage sludge to soil

Conditions and measures related to external treatment of waste (including article waste)

Particular considerations on the waste treatment operations: No (low concentration)
Explanation for the CSR: Particular risks from waste treatment unlikely due low concentration of substance in waste stream. Waste disposal according to national/local legislation is sufficient. If the metal content of the waste is elevated enough, internal or external recovery/recycling is considered.
For ES for communication: Dispose of waste product or used containers according to local regulations.

Use amounts

Daily use amount at a site (tonnes/day): -
Assessment defaults as set by ERC. It is recommended to use a realistic substance use rate.
For ES for communication: Daily amount per site <= tonnes/day

Extrapolation factor for annual use amount: 220
The 10th percentile of reported site-specific number of emission days for 97 sites. Default number of emission days are derived from a multi-metal background database of measured site-specific release factors collected under the former Directive of New and Existing Substances and REACH 2010 registration dossiers.

Sub-SPERC: Eurometaux SPERC 5.1.v2 Industrial use of metals and metal compounds in metallic coating

Sub-SPERC applicability

Environmental release category	ERC 5

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.5	0.2	1	1

Explanations specific to the Sub-SPERC

Releases to water:
release after STP Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The 90th percentile of reported site-specific release factors to wastewater for 114 sites.

Releases to air:
release after RMM Default release factors are derived from a multi-metal background database of measured

site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The 90th percentile of reported site-specific release factors to air for 97 sites.
Releases to non agricultural soil: ERC default
Releases to waste: Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The 90th percentile of reported site-specific release factors to solid waste for 32 downstream user sites covering zinc, nickel, lead, antimony

Chesar version: 2.3
Chesar SPERC modification date: 05/04/2019

SPERC Eurometaux SPERC 5.2.v2: Industrial use of metals (compounds) in batteries

Author: Eurometaux
Version date: April 2018

Product/substance domain	Limitations of coverage compared to ERC relate to: User groups: Industrial use of metals (compounds) in batteries Substance groups or functions: Release defaults are derived from measured emissions. Metal representativeness of background data: Metal (compound) is defined here in a broad sense. The definition includes alkali metals, alkaline earth metals, transition metals, post-transition metals, metalloids and their compounds but excludes non-metals, halogens, noble gases and metallo-organic compounds. SPERC valid for metals with solid water partition coefficient for suspended matter between 25,000 L/kg and 300,000 L/kg. Types of products: Metal and/or metal compounds
Description of activities/processes	Since metal SPERCs are based on measured data at end-of-pipe on-site, all indicated PROCs are integrated in the release fractions from raw materials handling to cleaning and maintenance. Semi-finished products are further processed through a variety of mechanical processes to a variety of metal and alloy industrial and consumer products: machining (all processes in which a workpiece is modified by removing unwanted material in the form of turnings with the aim to obtain the desired shape, includes: turning, drilling, countersinking, reaming, planning, shaping, broaching, sawing, filing, rasping and grinding), cold forming, mechanical polishing (mechanical abrasion). Batch annealing where each workpiece is loaded into a furnace for static exposure to heat. Strand annealing where the workpiece passes continuously through the controlled atmosphere.Conform, heating and forming under pressure. Forging, heating of the workpiece; manual or automatic loading of the workpiece into a press containig two halves of a die; closing the dies around the metal to form the desired piece; ejection of workpiece; removal of the excess metal (flash) around the piece.
Life cycle stage	Use at industrial sites
Chemical product category	
Sector of use	SU 14: Manufacture of basic metals, including alloys
Link to website	http://www.reach-metals.eu/

Conditions of use

Technical and organisational conditions and measures

On site treatment of off-air: Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter
Explanation for the CSR: Direct air emissions should be reduced by implementing one or more of the following RMMs:
• Electrostatic precipitators using wide electrode spacing: 5 – 15 mg/Nm³
• Wet electrostatic precipitators: < 5 mg/Nm³
• Cyclones, but as primary collector: < 50 mg/Nm³
• Fabric or bag filters: high efficiency in controlling fine particulate (melting): achieve emission values < 5mg/Nm³. Membrane filtration techniques can achieve < 1 mg/Nm³
• Ceramic and metal mesh filters. PM10 particles are removed: 0.1 mg/Nm³
Wet scrubbers: < 4 mg/Nm
For ES for communication: *Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter*

On site treatment of wastewater: Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange

Explanation for the CSR: Following IPPC-BREF note document, the treatment methods are very much dependent on the specific processes and the metals involved. Direct water emissions should be reduced by implementing one or more of the following RMMs:
• Chemical precipitation: used primarily to remove the metal ions (e.g. Ca(OH)2, pH 11 precipitation: >99% removal efficiency; Fe(OH)3, pH 11: 96% removal efficiency)
• Sedimentation (e.g. Na2S, pH 11, >99% removal efficiency) • Filtration: used as final clarification step (e.g. ultrafiltration, pH 5.1: 93% removal efficiency, nanofiltration: 97% removal efficiency, reverse osmosis, pH 4-11: 99% removal efficiency)
"• Electrolysis: for low metal concentration (e.g. electrodialysis: 13% removal efficiency within 2 hours at 2g/L, membrane electrolysis, electrochemical precipitation, pH 4-10, >99% removal efficiency) • Reverse osmosis: extensively used for the removal of dissolved metals Ion exchange: final cleaning step in the removal of heavy metal from process wastewater (e.g. 90% removal efficiency for clinoptinolite and 100% removal efficiency for synthetic zeolite) More information can be found in EC (2001), Integrated Pollution Prevention and Control (IPCC): reference document on Best Available Techniques in the Non Ferrous Metals Industries.
For ES for communication: *Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange*

Conditions and measures related to biological sewage treatment plant

Biological STP : Site specific [Effectiveness Water: -%]
Explanation for the CSR: -
For ES for communication: Provide onsite wastewater removal efficiency of %

Discharge rate of STP >= 2E3 m3/day
Explanation for the CSR: -
For ES for communication: Assumed domestic sewage treatment plant flow >= 2E3 m3/day

Application of the STP sludge on agricultural soil: No
Explanation for the CSR: -
For ES for communication: No application of sewage sludge to soil

Conditions and measures related to external treatment of waste (including article waste)

Particular considerations on the waste treatment operations: No (low concentration)
Explanation for the CSR: Particular risks from waste treatment unlikely due low concentration of substance in waste stream. Waste disposal according to national/local legislation is sufficient. If the metal content of the waste is elevated enough, internal or external recovery/recycling is considered.
For ES for communication: Dispose of waste product or used containers according to local regulations.

Use amounts

Daily use amount at a site (tonnes/day): -
Assessment defaults as set by ERC 12a. It is recommended to use a realistic substance use rate.
For ES for communication: Daily amount per site <= tonnes/day

Extrapolation factor for annual use amount: 220
Default number of emission days are derived from a multi-metal background database of measured site-specific release factors collected under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. 220 is the 10th percentile of reported site-specific number of emission days for 67 sites.

Sub-SPERC: Eurometaux SPERC 5.2.v2 Industrial use of metals (compounds) in batteries

Sub-SPERC applicability

Environmental release category	ERC 5

Release factors

To water (%)	To air (%)	To non agricultural soil (%)	To waste (%)
0.003	0.003	1	1

Explanations specific to the Sub-SPERC

Releases to water:
release after RMM Default release factors are derived from a multi-metal background database of measured

site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The 90th percentile of reported site-specific release factors to wastewater for 78 sites.
Releases to air: release after RMM Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The 90th percentile of reported site-specific release factors to air for 66 sites.
Releases to non agricultural soil: ERC default
Releases to waste: Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The 90th percentile of reported site-specific release factors to solid waste for 32 downstream user sites covering zinc, nickel, lead, antimony

Chesar version: 2.3
Chesar SPERC modification date: 05/04/2019

SPERC Eurometaux SPERC 5.3.v2: Industrial use of massive metal in shaping

Author: Eurometaux
Version date: April 2018

Product/substance domain	Limitations of coverage compared to ERC relate to: User groups: Industrial use of massive metal or alloys. This includes production of SEMIS, drawing of cables, production of ingots, shaping of massive metal or alloys. Release defaults are derived from measured emissions. Sector representativeness of background data: Substance groups or functions: Release defaults are derived from measured emissions. Metal representativeness of background data: Metal (compound) is defined here in a broad sense. The definition includes alkali metals, alkaline earth metals, transition metals, post-transition metals, metalloids and their compounds but excludes non-metals, halogens, noble gases and metallo-organic compounds. SPERC valid for metals with solid water partition coefficient for suspended matter between 10,000 L/kg and 300,000 L/kg. Types of products: Metal (massive)
Description of activities/processes	Since metal SPERCs are based on measured data at end-of-pipe on-site, all indicated PROCs are integrated in the release fractions from raw materials handling to cleaning and maintenance. Semi-finished products are further processed through a variety of mechanical processes to a variety of metal and alloy industrial and consumer products: machining (all processes in which a workpiece is modified by removing unwanted material in the form of turnings with the aim to obtain the desired shape, includes: turning, drilling, countersinking, reaming, planning, shaping, broaching, sawing, filing, rasping and grinding), cold forming, mechanical polishing (mechanical abrasion). Batch annealing where each workpiece is loaded into a furnace for static exposure to heat. Strand annealing where the workpiece passes continuously through the controlled atmosphere.Conform, heating and forming under pressure. Forging, heating of the workpiece; manual or automatic loading of the workpiece into a press containig two halves of a die; closing the dies around the metal to form the desired piece; ejection of workpiece; removal of the excess metal (flash) around the piece.
Life cycle stage	Use at industrial sites
Chemical product category	
Sector of use	SU 14: Manufacture of basic metals, including alloys
Link to website	http://www.reach-metals.eu/

Conditions of use

Technical and organisational conditions and measures

On site treatment of off-air: Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter
Explanation for the CSR: Direct air emissions should be reduced by implementing one or more of the following RMMs:
• Electrostatic precipitators using wide electrode spacing: 5 – 15 mg/Nm³
• Wet electrostatic precipitators: < 5 mg/Nm³
• Cyclones, but as primary collector: < 50 mg/Nm³
• Fabric or bag filters: high efficiency in controlling fine particulate (melting): achieve emission values < 5mg/Nm³. Membrane filtration techniques can achieve < 1 mg/Nm³
• Ceramic and metal mesh filters. PM10 particles are removed: 0.1 mg/Nm³
Wet scrubbers: < 4 mg/Nm
For ES for communication: *Electrostatic precipitators or wet electrostatic precipitators or cyclones or fabric/bag filter or ceramic/metal mesh filter*

On site treatment of wastewater: Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange
Explanation for the CSR: Following IPPC-BREF note document, the treatment methods are very much dependent on the specific processes and the metals involved. Direct water emissions should be reduced by implementing one or more of the following RMMs:
• Chemical precipitation: used primarily to remove the metal ions (e.g. Ca(OH)2, pH 11 precipitation: >99% removal efficiency; Fe(OH)3, pH 11: 96% removal efficiency)
• Sedimentation (e.g. Na2S, pH 11, >99% removal efficiency) • Filtration: used as final clarification step (e.g. ultrafiltration, pH 5.1: 93% removal efficiency, nanofiltration: 97% removal efficiency, reverse osmosis, pH 4-11: 99% removal efficiency)
"• Electrolysis: for low metal concentration (e.g. electrodialysis: 13% removal efficiency within 2 hours at 2g/L, membrane electrolysis, electrochemical precipitation, pH 4-10, >99% removal efficiency) • Reverse osmosis: extensively used for the removal of dissolved metals Ion exchange: final cleaning step in the removal of heavy metal from process wastewater (e.g. 90% removal efficiency for clinoptinolite and 100% removal efficiency for synthetic zeolite) More information can be found in EC (2001), Integrated Pollution Prevention and Control (IPCC): reference document on Best Available Techniques in the Non Ferrous Metals Industries.
For ES for communication: *Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange*

Conditions and measures related to biological sewage treatment plant

Biological STP : Site specific [Effectiveness Water: -%]
Explanation for the CSR: -
For ES for communication: Provide onsite wastewater removal efficiency of %

Discharge rate of STP >= 2E3 m3/day
Explanation for the CSR: -
For ES for communication: Assumed domestic sewage treatment plant flow >= 2E3 m3/day

Application of the STP sludge on agricultural soil: No
Explanation for the CSR: -
For ES for communication: No application of sewage sludge to soil

Conditions and measures related to external treatment of waste (including article waste)

Particular considerations on the waste treatment operations: No (low amount)
Explanation for the CSR: Particular risks from waste treatment unlikely due to small fraction of used substance entering into the waste stage. Waste disposal according to national/local legislation is sufficient. In case of elevated metal concentration, recycling is considered.
For ES for communication: Dispose of waste product or used containers according to local regulations.

Other conditions affecting environmental exposure

Place of use: Indoor/Outdoor
Explanation for the CSR: -
For ES for communication: Indoor/Outdoor use

Use amounts

Daily use amount at a site (tonnes/day): -
The substance use rate are the assessment defaults as set by ERC. It is recommended to use a realistic substance use rate.
For ES for communication: Daily amount per site <= tonnes/day

Extrapolation factor for annual use amount: 216
The minimum of the 10th percentiles of reported site-specific number of emission days derived from a multi-metal background database of measured site-specific release factors collected under the former Directive of New and Existing Substances and REACH 2010 registration dossiers.

Sub-SPERC: Eurometaux SPERC 5.3.v2 Industrial use of massive metal in shaping

Sub-SPERC applicability

Environmental release category	ERC 5

Additional information on applicability domain: SPERC valid for metals with solid water partition coefficient for suspended matter between 10,000 L/kg and 300,000 L/kg.

Release factors			
To water (%)	**To air (%)**	**To non agricultural soil (%)**	**To waste (%)**
0.003	0.02	1	1

Explanations specific to the Sub-SPERC

Releases to water:
release after STP Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The maximum of the 90th percentiles of reported site- specific release factors to wastewater for • 14 sites from cable drawing (0.0002%) • 9 sites from ingots (0.00009%) • 12 sites from processing alloys (0.003%) • 22 sites from metal product manufacture (0.0005%) • 44 sites from Semis production (0.0007%)

Releases to air:
release after STP Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The maximum of the 90th percentiles of reported site-specific release factors to air for • 11 sites from cable drawing (0.002%) • 8 sites from ingots (0.02%) • 17 sites from processing alloys (0.02%) • 20 sites from metal product manufacture (0.001%) • 24 sites from Semis production (0.002%)

Releases to non agricultural soil:
Assessment default as set by ERC

Releases to waste:
Default release factors are derived from a multi-metal background database of measured site-specific release factors collected from peer-reviewed EU Risk Assessment Reports under the former Directive of New and Existing Substances and REACH 2010 registration dossiers. The 90th percentile of reported site-specific release factors to solid waste for 32 downstream user sites covering zinc, nickel, lead, antimony

Chesar version: 2.3
Chesar SPERC modification date: 05/04/2019