

1. Title		Version 6, 2015
GES 20 Use of silver-nickel contact material		
Life cycle	End use - DU of Ni metal	
Free short title	Use of Ag/Ni contact material (Used to create an electrically conductive connection of two parts or as an electrical contact in switchgear)	
Systematic title based on use descriptor	SU: SU 3 Industrial use PC: PC 7 Base metals and alloys ERC: ERC 5 Industrial use resulting in inclusion into or onto a matrix SPERC Industrial use: shaping PROC: PROC 26 Handling of solid inorganic substances at ambient temperature	
Processes, tasks, activities covered (environment)	Use of Ag/Ni contact material	
Processes, tasks, activities covered (workers)	Use of Ag/Ni contact material	
2. Operational conditions and risk management measures		
2.1 Control of environmental exposure		
Environmental related free short title	Use of Ag/Ni contact material	
Systematic title based on use descriptor (environment)	SPERC Industrial use: shaping	
Processes, tasks, activities covered (environment)	Use of Ag/Ni contact material	
Environmental Assessment Method	Estimation of local concentrations based on the use of SPERC for Industrial use: shaping and measured regional concentrations are used for calculation of PEC for the terrestrial compartment	
Product characteristics		
Metallic Alloy containing Nickel (as solid material)		
Amounts used		
Maximum daily use at a site	300 g	
Maximum annual use at a site	Not given	
Frequency and duration of use		
Pattern of release to the environment	No emission to water compartments	
Environment factors not influenced by risk management		
Receiving surface water flow rate	Not relevant	
Dilution capacity, freshwater	Not relevant	
Dilution capacity, marine	Not relevant	
Other given operational conditions affecting environmental exposure		
Not given		
Technical conditions and measures at process level (source) to prevent release		
Not given		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil		
Waste water:		
No emission via wastewater		
Air:		
Release factor after on-site treatment: 30 g/T (SPERC Industrial use: shaping)		
Organizational measures to prevent/limit release from site		
None		
Conditions and measures related to municipal sewage treatment plant		
Municipal Sewage Treatment Plant (STP)	No	
Discharge rate of the Municipal STP	Not relevant	
Incineration of the sludge of the Municipal STP	Not relevant	
Conditions and measures related to external treatment of waste for disposal		
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 nickel content of the waste is elevated enough, internal or external recovery/recycling might be considered.

Fraction of daily/annual use expected in waste:

- Nickel producers = 0.05 %
- DU: stainless steel and alloy steels = 0.6 %
- DU: nickel alloys, copper alloys, foundry, batteries, catalysts, chemicals, dyes and others = 0.5 %
- DU: Plating = 3%

Appropriate waste codes:

01 03 07*, 02 01 10*, 06 03 13*, 06 03 15*, 06 04 05*, 06 05 02*, 10 08 04, 10 08 08*, 10 08 09, 10 08 15*, 10 08 16, 10 10 03, 10 10 05*, 10 10 07*, 10 10 09*, 10 10 10, 10 10 11*, 11 02 07*, 12 01 03*, 12 01 04, 15 01 04*, 15 01 10*, 16 01 04*, 16 01 06*, 16 01 08*, 16 06 02*, 16 06 05, 16 08 02*, 16 08 03*, 17 04 07*, 17 04 09*, 19 09 04*, 19 10 02*, 19 12 03*

Suitable disposal: Keep separate and dispose of to either

- Hazardous waste incineration operated according to Council Directive 2008/98/EC on waste, Directive 2000/76/EC on the incineration of waste and the Reference Document on the Best Available Techniques for Waste Incineration of August 2006.
- Hazardous landfill operated under Directive 1999/31/EC.

Conditions and measures related to external recovery of waste

Shredders pre-treating metal wastes should have a maximum release factors to air of 0.0015 after RMM and no releases to water and soil.

Qmax, local(shredding)=26kg Ni/day

(Note: This Qmax, local for shredders is based on the existing information at the moment of the update. It will be reviewed when new information is available from the BREF for shredding)

2.2 Control of workers exposure

Use of Ni contact material

Workers related free short title	Use of Ag/Ni contact material
Use descriptor covered	PROC 26 Handling of solid inorganic substances at ambient temperature
Processes, tasks, activities covered	Use of Ag/Ni contact material
Assessment Method	Estimation of exposure based on qualitative assessment

Product characteristic

Metallic Alloy containing Nickel (Solid material)

Amounts used

Amount used per time or activity <100 g

Frequency and duration of use/exposure

8 hour shifts.

Human factors not influenced by risk management

Respiration volume under conditions of use	Not relevant
Room size and ventilation rate	Not relevant
Area of skin contact with the substance under conditions of use	Not relevant
Body weight	Not relevant

Other given operational conditions affecting workers exposure

The ES excludes the use of contact materials for welding and where contacts could experience high levels of erosion (e.g. under the influence of an arc)

Prevent overheating of contact materials

Oral: Good workplace hygiene practice

Technical conditions and measures at process level (source) to prevent release

None							
Technical conditions and measures to control dispersion from source towards the worker							
None							
Organisational measures to prevent /limit releases, dispersion and exposure							
None							
Conditions and measures related to personal protection, hygiene and health evaluation							
Suitable gloves should be worn to minimize dermal contact when handling Ni-containing materials.							
3. Exposure and risk estimation							
Environment							
SPERC Industrial use: shaping Use of Ni in contact materials							
Compartment	Unit	PNEC	PEC _{Regional}	C _{local}	PEC	RCR	Methods for calculation of environmental concentrations
Freshwater	µg Ni/L	7.1	2.9				No wastewater emission
Sediment	mg Ni/kg	136	33.5				No wastewater emission
Terrestrial	mg Ni/kg	29.9	16.2	<0.01	16.20	0.54	esimated values, Tier 3-RWC
Workers							
PROC 26: Use of Ni in contact materials							
	Unit	DNEL	Exposure concentration	RCR	Methods for calculation of exposure		
Dermal							
Acute systemic	mg Ni /kg/day	-	NR				
Acute local	mg Ni /cm ² /day	-	NR				
Long-term systemic	mg Ni /kg/day	-	NR				
Long-term local	mg Ni /cm ² /day	0.035	5*10 ⁻⁶	0.001	No dermal exposure is anticipated during use, the dermal exposure was estimated as being close to the limit of detection		
Inhalation							
Acute local	mg Ni /m ³	4.0	0.01	0.0025	Estimated as 10 x 75 th percentile of long-term average exposure to allow for the uncertainty in the estimate of shift mean exposure		
Long-term systemic and local	mg Ni /m ³	0.05	0.001	0.02	75 th percentile long-term exposure estimate based on expert judgement, taking account of how the contact material is used, including the improbability that use would lead to the generation of measurable levels of Ni in air		
NR: Not Relevant							

Acute local inhalation

DNEL based on respirable size aerosols. Equivalent inhalable fraction levels expected to be at least 3-fold higher

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Scaling tool: Metals EUSES IT tool (free download: <http://www.arche-consulting.be/Metal-CSA-toolbox/du-scaling-tool>)

Scaling of the release to air and water environment includes:

Refining of the release factor to air and waste water and/or and the efficiency of the air filter and wastewater treatment facility.

Scaling of the PNEC for aquatic environment by using a tiered approach for correction for bioavailability and background concentration (C_{local} approach).

Scaling of the PNEC for soil compartment by using a tiered approach for correction for bioavailability and background concentration (C_{local} approach).

Workers

Scaling considering duration and frequency of use

Collect process monitoring data with an inhalable sampler. The simultaneous use of a respirable sampler is encouraged. Use aerosol particle size information, when available, to confirm the appropriate use of the inhalable DNEL of 0.05 mg Ni/m³.

Respirable fraction exposure levels should be kept below 0.01 mg Ni/m³.

For further information and guidance on exposure scenarios, available tools, and scaling options, please visit the Nickel Consortia exposure scenario library at the following link: <http://www.nickelconsortia.eu/exposure-scenario-library.html>

Man via Environment exposure and risk characterisation assessments for the use of silver-nickel contact materials

Inhalation is the critical exposure pathway for humans via the environment. The PEC for air at site neighbouring residential areas should be lower than the chronic inhalation DNEL for the general public of 20 ng Ni/m³ as annual average in PM₁₀ in order to demonstrate adequate control of risk (RCR < 1) for Man via the Environment (MvE).

Hereto a Generic safe use Exposure Scenario for MvE was developed based on the EUSES model. The MvE GES is defined as the product of tonnage (T) and emission factor to air (EF) being lower than 18000 g Ni/year. The value of 18000 g Ni/year is derived by using EUSES model to back-calculate the product of T and EF that results in a local air concentration (C_{local}) of 15.5 ng Ni/m³. The value of 15.5 is derived from the difference between the DNEL of 20 ng Ni/m³ and the EU regional background concentration ($C_{regional}$) of 4.5 ng Ni/m³ (P90 annual concentration for 2012).

Generic safe use ES for all sectors according to Tier 1 (EUSES model)

Sector	Tonnage (Ni T /year)	Emission factor (g Ni/T)	Tonnage × emission factor (g /year)	C_{local} (ng/m ³)	$C_{regional}$ (ng/m ³)	PEC _{local} (ng/m ³)	RCR = PEC/DNEL (DNEL= 20 ng/m ³)
All	T	EF	T × EF < 18000	<15.5	4.5*	<20	<1

*: EU average of country P90 annual Ni concentrations (2012)

If a site is not compliant with these conditions, meaning that the product of tonnage and emission factor is above 18000 g Ni/year, a tiered approach including site-specific modelling can be applied to demonstrate safe use