

13. ES 13: Widespread use by professional workers; Use of nickel-containing brazing alloys in professional settings

13.1. Title section

Product category: Welding and soldering products, flux products (PC 38)

Sector of use: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment. (SU 17)

Environment	
1: Use of nickel-containing consumables for welding/brazing by professionals - Discharge to fresh water via municipal sewage treatment plant	ERC 8f
Worker	
2: Handling of massive objects	PROC 21
3: Manual brazing	PROC 25
4: Manual welding	PROC 25

13.2. Conditions of use affecting exposure

13.2.1. Control of environmental exposure: Use of nickel-containing consumables for welding/brazing by professionals - Discharge to fresh water via municipal sewage treatment plant (ERC 8f)

Conditions and measures related to biological sewage treatment plant
Municipal sewage treatment plant is assumed.
Conditions and measures related to external treatment of waste (including article waste)
Dispose of waste product or used containers according to local regulations.

13.2.2. Control of worker exposure: Handling of massive objects (PROC 21)

Product (article) characteristics
Maximum emission potential covered in this ES: Very low.
Physical form of product; Massive object
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.

13.2.3. Control of worker exposure: Manual brazing (PROC 25)

Product (article) characteristics
Maximum emission potential covered in this ES: Low (temperature based).
Physical form of product: Molten.
Technical and organisational conditions and measures
Covers use at temperatures below melting point.
Local exhaust ventilation
Conditions and measures related to personal protection, hygiene and health evaluation
Dermal contact with the substance has to be excluded.

13.2.4. Control of worker exposure: Manual welding (PROC 25)

Product (article) characteristics
Maximum emission potential covered in this ES: High (temperature based).
Physical form of product: Molten.
Technical and organisational conditions and measures
Covers use at temperatures above melting point of the substance.
Conditions and measures related to personal protection, hygiene and health evaluation
Dermal contact with the substance has to be excluded.
APF of RPE = 10 (90% respiratory protection). For further specification, refer to section 8 of the SDS.
Clothing and personal protective equipment that shields from the heat and other hazards of the specific task and welding method conducted. Such PPE may include fire-retardant clothing, heavy gloves, safety shoes, helmet or hair protection, and protective apron/leggings. Eye protection is also mandatory, both for reducing the effects of radiant energy and stopping any chips or fragments that may fly off the workpieces. Workers should also not carry flammable or explosive items such as butane cigarette lighters. Best practice advice for risk management measures can be found in a Communication statement from the European Welding Association, available at: https://european-welding.org/wp-content/uploads/2016/10/Communication-statements_july_2010.pdf .

13.3. Exposure estimation and reference to its source

13.3.1. Environmental release and exposure: Use of nickel-containing consumables for welding/brazing by professionals - Discharge to fresh water via municipal sewage treatment plant (ERC 8f)

Release route	Release rate	Release estimation method
Water	0.11 kg/day	ERC
Air	0.33 kg/day	ERC
Soil	0.011 kg/day	ERC

Protection target	Exposure estimate	RCR
Fresh water	5.27E-3 mg/L (EUSES 2.1.2)	0.742
Sediment (freshwater)	45.85 mg/kg dw (PEC sediment calculation method for metals local)	0.421
Marine water	5.37E-4 mg/L (EUSES 2.1.2)	0.062
Sediment (marine water)	17.34 mg/kg dw (PEC sediment calculation method for metals local)	0.159
Sewage Treatment Plant	0.033 mg/L (EUSES 2.1.2)	0.1
Agricultural soil	17.12 mg/kg dw (EUSES 2.1.2)	0.573

13.3.2. Worker exposure: Handling of massive objects (PROC 21)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, local, long term	9E-3 mg/m ³ (Measured data)	0.18

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, acute	0.037 mg/m ³ (Measured data)	< 0.01
Dermal, local, long term	5.18 µg/cm ² (Measured data)	0.148
Combined, systemic, long term		0.18

13.3.3. Worker exposure: Manual brazing (PROC 25)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, local, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, local, acute	0.027 mg/m ³ (Measured data)	< 0.01
Dermal, local, long term	0.76 µg/cm ² (Measured data)	0.022
Combined, systemic, long term		0.18

13.3.4. Worker exposure: Manual welding (PROC 25)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.041 mg/m ³ (Measured data)	0.82
Inhalation, local, long term	0.041 mg/m ³ (Measured data)	0.82
Inhalation, local, acute	0.122 mg/m ³ (Measured data)	0.01
Dermal, local, long term	0.76 µg/cm ² (Measured data)	0.022
Combined, systemic, long term		0.82

13.4. 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".