

NICKEL SULPHAMATE SOLUTION

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

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Version: 4.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture
Product name : NICKEL SULPHAMATE SOLUTION
EC index no : 028-018-00-4
EC no : 237-396-1
CAS No : 13770-89-3
REACH registration No : 01-2119488202-41-0005
Product code : 001104
Formula : Ni(SO₃NH₂)₂ xH₂O

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/mixture : GES 2 - Use of nickel sulphamate in metal surface treatment - nickel electroplating, nickel electroforming and electroless nickel plating.

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

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P.A. DU VERT GALANT
95310 SAINT-OUEN L'AUMÔNE - FRANCE
Tél : +33 (0)1 34 40 12 80
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1.4. Emergency telephone number

Emergency number : N° ORFILA: +33 (0)1 45 42 59 59

Country	Official advisory body	Address	Emergency number	Comment
United Kingdom	National Poisons Information Service		0344 892 0111	

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Acute toxicity (oral), Category 4	H302	Expert judgment
Acute toxicity (inhal.), Category 4	H332	Expert judgment
Sensitisation — Respiratory, Category 1	H334	Calculation method
Sensitisation — Skin, Category 1	H317	Calculation method
Germ cell mutagenicity, Category 2	H341	Calculation method
Carcinogenicity (inhalation) Category 1A	H350i	Calculation method
Reproductive toxicity, Category 1B	H360	Calculation method
Specific target organ toxicity — Repeated exposure, Category 1	H372	Calculation method
Hazardous to the aquatic environment — Acute Hazard, Category 1	H400	Calculation method
Hazardous to the aquatic environment — Chronic Hazard, Category 1	H410	Calculation method

Full text of H statements : see section 16

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Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS07

GHS08

GHS09

Signal word (CLP) :

Danger

Hazardous ingredients :

Nickel sulfamate

Hazard statements (CLP) :

H302+H332 - Harmful if swallowed or if inhaled
H317 - May cause an allergic skin reaction
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H341 - Suspected of causing genetic defects
H350i - May cause cancer by inhalation
H360 - May damage the unborn child (Perinatal lethality)
H372 - Causes damage to organs (lungs, Respiratory tract) through prolonged or repeated exposure (if inhaled)
H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements (CLP) :

P201 - Obtain special instructions before use
P260 - Do not breathe dust/fume/gas/mist/vapours/spray
P273 - Avoid release to the environment
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P285 - In case of inadequate ventilation wear respiratory protection
P302+P352 - IF ON SKIN: Wash with plenty of soap and water
P304+P340 - IF INHALED: remove victim to fresh air and keep at rest in a position comfortable for breathing
P308+P313 - IF exposed or concerned: Get medical advice/attention
P312 - Call a POISON CENTER or doctor/physician if you feel unwell
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
P363 - Wash contaminated clothing before reuse
P391 - Collect spillage

Extra phrases :

Restricted to professional users

2.3. Other hazards

Other hazards not contributing to the classification : None under normal conditions.

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Nickel sulfamate	(CAS No) 13770-89-3 (EC no) 237-396-1 (EC index no) 028-018-00-4	50 - 100	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Resp. Sens. 1, H334 Skin Sens. 1, H317 Muta. 2, H341 Carc. 1B, H350i Repr. 1B, H360D STOT RE 1, H372 Aquatic Acute 1, H400 (M=1) Aquatic Chronic 1, H410 (M=1)

Full text of H-statements: see section 16

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SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.
- First-aid measures after inhalation : In case of accident by inhalation : remove casualty to fresh air and keep at rest. If breathing is irregular or has stopped, effect artificial respiration resuscitation. Get immediate medical advice and attention. Do not apply mouth-to-mouth resuscitation. In case of allergic reaction, consult a doctor.
- First-aid measures after skin contact : Take off immediately all contaminated clothing and wash it before reuse. May cause more severe reaction if confined to skin by clothing, watches, rings or shoes. In case of allergic reaction, consult a doctor. If the contaminated area is widespread and/or there is damage to the skin, a doctor must be consulted or the patient transferred to hospital.
- First-aid measures after eye contact : Rinse immediately with plenty of water, also under the eyelids (> 15 min).
- First-aid measures after ingestion : Do not give the patient anything orally. In the event of swallowing, if the quantity is small (no more than one mouthful), rinse the mouth with water, administer activated medical charcoal and consult a doctor. If swallowed, seek medical advice immediately and show this container or label. If swallowed accidentally, call a doctor to assess the need for monitoring and subsequent treatment in hospital. Show him the label.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Non flammable. Use extinguishing media appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

- Reactivity in case of fire : Fire will produce dense black smoke. Decomposition products may be a hazard to health. Do not breathe dust.
- Hazardous decomposition products in case of fire : Sulphur dioxide. Nitrogen oxide. Nitrogen dioxide. Ammonia.

5.3. Advice for firefighters

Precautionary measures fire : Due to the toxicity of the gas emitted on thermal decomposition of the products, fire-fighting personnel are to be equipped with autonomous insulating breathing apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Refer to protective measures listed in Sections 7 and 8.

6.1.1. For non-emergency personnel

- Protective equipment : If a large quantity has been spilt, evacuate all personnel and only allow intervention by trained operators equipped with safety apparatus.
- Emergency procedures : Do not breathe vapours. Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment : Only qualified personnel equipped with suitable protective equipment may intervene. Concerning personal protective equipment to use, see section 8.

6.2. Environmental precautions

Contain and control the leaks or spills with non-combustible absorbent materials such as sand, earth, vermiculite, diatom earth in drums for waste disposal. Do not allow into drains or water courses.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : If the ground is contaminated, once the product has been recovered by sponging with an inert and non-combustible absorbent material, wash the contaminated area in plenty of water. Clean preferably with a detergent - Avoid the use of solvents.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : The regulations relating to storage permits apply to workshops where the product is handled. Anyone with a history of asthma, allergies, chronic or periodic respiratory problems must on no account use these preparations. Anyone with a history of skin sensitisation must on no account handle such products. Avoid exposure to pregnant women and warn women of child-bearing age of the possible risks.

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Precautions for safe handling : Always wash hands after handling the product. Take off contaminated clothing and wash before reuse. Prevention of fire and explosion : Handle in well-ventilated areas., Prevent unauthorised access. Recommended equipment and procedures: For further information refer to section 8: "Exposure controls/personal protection", Observe the label precautions, Do not breathe smoke, Carry out any industrial operation which may give rise to this in a sealed apparatus., Provide sufficient air exchange and/or exhaust, Also provide breathing apparatus for certain short tasks of an exceptional nature and for emergency interventions., In all cases, recover emissions at source., Avoid exposure - obtain special instructions before use, Prohibited equipment and procedures:, Smoking, eating and drinking are prohibited in premises where the preparation is used. Prohibited equipment and procedures: Smoking, eating and drinking are prohibited in premises where the preparation is used.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store tightly closed in a dry, cool and well-ventilated place. Keep away from food, drink and animal feeding stuffs. Store always product in container of same material as original container.

7.3. Specific end use(s)

See Heading 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Exposure controls

Personal protective equipment : Use clean and properly maintained personal protective equipment. Store personal protective equipment in a clean place, away from the work area.

Materials for protective clothing : Avoid contact with skin. Wear suitable protective clothing. In case of large projections, wear chemical protective clothing impervious to liquids (type 3) according to the NF EN14605 to avoid contact with skin. If risk of splashing, wear chemical protective clothing (type 6) comply with the NF EN13034 to avoid contact with skin. Personnel shall wear protective clothing regularly laundered. Grossly contaminated clothing should be removed and the skin washed with soap and water or a proprietary skin cleaner

Hand protection : Wear suitable gloves resistant to chemical penetration (EN 374). The glove selection must be made according to the application and duration of use at the workplace. The gloves should be selected based on workplace: Other chemicals which may be handled, physical requirements (cut, puncture, thermal protection), dexterity. waterproof gloves

Type	Material	Permeation	Thickness (mm)	Penetration	Standard
Protective gloves	Nitrile rubber (NBR), Polyvinylchloride (PVC) , Butyl rubber, Latex				

Eye protection : Avoid contact with eyes. Use splash goggles when eye contact due to splashing is possible. Before handling powders or dust emission, it is necessary to wear goggles conforming to standard NF EN 166

Respiratory protection : Do not breathe vapour. In case of insufficient ventilation, wear suitable respiratory equipment. Air-fed respiratory protective equipment should be worn when this product is sprayed if the exposure of the sprayer or other people nearby cannot be controlled to below the occupational exposure limit

Environmental exposure controls : Do not allow uncontrolled discharge of product into the environment.

Other information : Do not eat, drink or smoke during use. Remove/Take off immediately all contaminated clothing. Ensure adequate ventilation, especially in confined areas.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid
Colour : Blue. Green.
Odour : odourless.
Odour threshold : No data available
pH : 4.4 - 4.7
Relative evaporation rate (butylacetate=1) : No data available
Melting point : No data available
Freezing point : No data available
Boiling point : No data available

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Flash point	: Not relevant
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Non flammable
Vapour pressure	: Not relevant
Relative vapour density at 20 °C	: Not applicable.
Relative density	: > 1
Solubility	: No data available
Log Pow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: Not applicable. Not applicable.

9.2. Other information

Other properties : Molecular mass : 250.865.

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable in use and storage conditions as recommended in item 7.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Do not freeze.

10.5. Incompatible materials

Oxidising agents. Alkali. Alkaline earth metals.

10.6. Hazardous decomposition products

No additional information available

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: Oral: Harmful if swallowed. Inhalation: Harmful if inhaled.
Skin corrosion/irritation	: Not classified pH: 4.4 - 4.7
Additional information	: Prolonged or repeated contact with the substance can remove fat from the skin and cause non-allergic dermatitis on contact and absorption through the skin May cause respiratory tract hypersensitivity that manifests as asthma, rhinitis / conjunctivitis and alveolitis
Serious eye damage/irritation	: Not classified pH: 4.4 - 4.7
Respiratory or skin sensitisation	: May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.
Germ cell mutagenicity	: Suspected of causing genetic defects.
Carcinogenicity	: May cause cancer by inhalation.
Reproductive toxicity	: May damage the unborn child (Perinatal lethality).
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Causes damage to organs (lungs, Respiratory tract) through prolonged or repeated exposure (if inhaled).
Aspiration hazard	: Not classified

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SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Very toxic to aquatic life with long lasting effects. The product must not be allowed to run into drains or waterways.

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

NICKEL SULPHAMATE SOLUTION (13770-89-3)	
BCF fish 1	< 100

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

NICKEL SULPHAMATE SOLUTION (13770-89-3)	
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII	
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII	

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste. Do not discharge into drains or the environment. Waste management is done without endangering human health and without harming the environment, and in particular without risk to water, air, soil, fauna or flora. Recycle or dispose of waste in compliance with current legislation, preferably via a certified collector or company. Do not contaminate the ground or water with waste, do not dispose of waste into the environment. Packaging contaminated by the product : Empty remaining contents. Keep label(s) on container. Give to a certified disposal contractor.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No. (ADR) : 3082
UN-No. (IMDG) : 3082
UN-No. (IATA) : 3082
UN-No. (ADN) : 3082
UN-No. (RID) : 3082

14.2. UN proper shipping name

Proper Shipping Name (ADR) : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Proper Shipping Name (IMDG) : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Proper Shipping Name (IATA) : Environmentally hazardous substance, liquid, n.o.s.
Proper Shipping Name (ADN) : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Proper Shipping Name (RID) : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Transport document description (ADR) : UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (NICKEL SULPHAMATE SOLUTION), 9, III, (E)
Transport document description (IMDG) : UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., 9, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS
Transport document description (IATA) : UN 3082 Environmentally hazardous substance, liquid, n.o.s., 9, III, ENVIRONMENTALLY HAZARDOUS
Transport document description (ADN) : UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., 9, III, ENVIRONMENTALLY HAZARDOUS
Transport document description (RID) : UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., 9, III, ENVIRONMENTALLY HAZARDOUS

14.3. Transport hazard class(es)

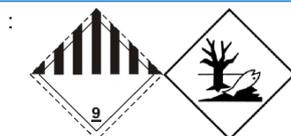
ADR

Transport hazard class(es) (ADR) : 9
Danger labels (ADR) : 9

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IMDG

Transport hazard class(es) (IMDG)

: 9

Danger labels (IMDG)

: 9



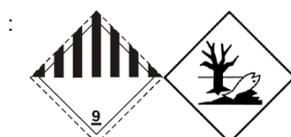
IATA

Transport hazard class(es) (IATA)

: 9

Hazard labels (IATA)

: 9



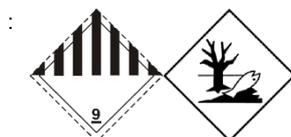
ADN

Transport hazard class(es) (ADN)

: 9

Danger labels (ADN)

: 9



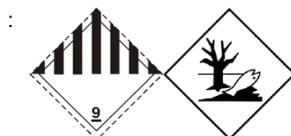
RID

Transport hazard class(es) (RID)

: 9

Danger labels (RID)

: 9



14.4. Packing group

Packing group (ADR)

: III

Packing group (IMDG)

: III

Packing group (IATA)

: III

Packing group (ADN)

: III

Packing group (RID)

: III

14.5. Environmental hazards

Dangerous for the environment

: Yes

Marine pollutant

: Yes

Other information

: No supplementary information available

14.6. Special precautions for user

- Overland transport

Classification code (ADR)

: M6

Special provisions (ADR)

: 274, 335, 601, 375

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Limited quantities (ADR)	: 5I
Excepted quantities (ADR)	: E1
Packing instructions (ADR)	: P001, IBC03, LP01, R001
Special packing provisions (ADR)	: PP1
Mixed packing provisions (ADR)	: MP19
Portable tank and bulk container instructions (ADR)	: T4
Portable tank and bulk container special provisions (ADR)	: TP1, TP29
Tank code (ADR)	: LGBV
Vehicle for tank carriage	: AT
Transport category (ADR)	: 3
Special provisions for carriage - Packages (ADR)	: V12
Special provisions for carriage - Loading, unloading and handling (ADR)	: CV13
Hazard identification number (Kemler No.)	: 90
Orange plates	:



Tunnel restriction code (ADR)	: E
EAC code	: •3Z

- Transport by sea

Special provisions (IMDG)	: 274, 335, 969
Limited quantities (IMDG)	: 5 L
Excepted quantities (IMDG)	: E1
Packing instructions (IMDG)	: P001, LP01
Special packing provisions (IMDG)	: PP1
IBC packing instructions (IMDG)	: IBC03
Tank instructions (IMDG)	: T4
Tank special provisions (IMDG)	: TP2, TP29
EmS-No. (Fire)	: F-A
EmS-No. (Spillage)	: S-F
Stowage category (IMDG)	: A

- Air transport

PCA Excepted quantities (IATA)	: E1
PCA Limited quantities (IATA)	: Y964
PCA limited quantity max net quantity (IATA)	: 30kgG
PCA packing instructions (IATA)	: 964
PCA max net quantity (IATA)	: 450L
CAO packing instructions (IATA)	: 964
CAO max net quantity (IATA)	: 450L
Special provisions (IATA)	: A97, A158, A197
ERG code (IATA)	: 9L

- Inland waterway transport

Classification code (ADN)	: M6
Special provisions (ADN)	: 274, 335, 375, 601
Limited quantities (ADN)	: 5 L
Excepted quantities (ADN)	: E1
Carriage permitted (ADN)	: T
Equipment required (ADN)	: PP
Number of blue cones/lights (ADN)	: 0

- Rail transport

Classification code (RID)	: M6
Special provisions (RID)	: 274, 335, 375, 601
Limited quantities (RID)	: 5L

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Excepted quantities (RID)	: E1
Packing instructions (RID)	: P001, IBC03, LP01, R001
Special packing provisions (RID)	: PP1
Mixed packing provisions (RID)	: MP19
Portable tank and bulk container instructions (RID)	: T4
Portable tank and bulk container special provisions (RID)	: TP1, TP29
Tank codes for RID tanks (RID)	: LGBV
Transport category (RID)	: 3
Special provisions for carriage – Packages (RID)	: W12
Special provisions for carriage - Loading, unloading and handling (RID)	: CW13, CW31
Colis express (express parcels) (RID)	: CE8
Hazard identification number (RID)	: 90

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

The following restrictions are applicable according to Annex XVII of the REACH Regulation (EC) No 1907/2006:

3. Liquid substances or mixtures which are regarded as dangerous in accordance with Directive 1999/45/EC or are fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008	NICKEL SULPHAMATE SOLUTION - Nickel sulfamate
3.b. Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10	NICKEL SULPHAMATE SOLUTION - Nickel sulfamate
3.c. Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard class 4.1	NICKEL SULPHAMATE SOLUTION - Nickel sulfamate
28. Substances which appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 classified as Carcinogen category 1A or 1B (Table 3.1) or Carcinogen category 1 or 2 (Table 3.2) and listed as follows: Carcinogen category 1A (Table 3.1)/Carcinogen category 1 (Table 3.2) listed in Appendix 1 Carcinogen category 1B (Table 3.1)/Carcinogen category 2 (Table 3.2) listed in Appendix 2	NICKEL SULPHAMATE SOLUTION - Nickel sulfamate
30. Substances which appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 classified as Toxic to Reproduction category 1A or 1B (Table 3.1) or Toxic to Reproduction category 1 or 2 (Table 3.2) and listed as follows: Reproductive toxicant category 1A adverse effects on sexual function and fertility or on development (Table 3.1) or Reproductive toxicant category 1 with R60 (May impair fertility) or R61 (May cause harm to the unborn child) (Table 3.2) listed in Appendix 5 Reproductive toxicant category 1B adverse effects on sexual function and fertility or on development (Table 3.1) or Reproductive toxicant category 2 with R60 (May impair fertility) or R61 (May cause harm to the unborn child) (Table 3.2) listed in Appendix 6	NICKEL SULPHAMATE SOLUTION - Nickel sulfamate

Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

15.1.2. National regulations

Germany

VwVwS Annex reference : Water hazard class (WGK) 3, severe hazard to waters (Classification according to VwVwS, Annex 4)

12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

SZW-lijst van kankerverwekkende stoffen : Nickel sulfamate is listed

SZW-lijst van mutagene stoffen : None of the components are listed

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NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : Nickel sulfamate is listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : Nickel sulfamate is listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : Nickel sulfamate is listed

15.2. Chemical safety assessment

A chemical safety assessment has been carried out

SECTION 16: Other information

Indication of changes:

Total revision according to Reach regulation.

Full text of H- and EUH-statements:

Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Acute 1	Hazardous to the aquatic environment — Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment — Chronic Hazard, Category 1
Carc. 1B	Carcinogenicity (inhalation) Category 1B
Muta. 2	Germ cell mutagenicity, Category 2
Repr. 1B	Reproductive toxicity, Category 1B
Resp. Sens. 1	Sensitisation — Respiratory, Category 1
Skin Sens. 1	Sensitisation — Skin, Category 1
STOT RE 1	Specific target organ toxicity — Repeated exposure, Category 1
H302	Harmful if swallowed
H317	May cause an allergic skin reaction
H332	Harmful if inhaled
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H341	Suspected of causing genetic defects
H350i	May cause cancer by inhalation
H360	May damage fertility or the unborn child
H360D	May damage the unborn child
H372	Causes damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects

SDS EU (REACH Annex II)

DISCLAIMER

*The information contained in this sheet comes from reliable sources. It has been drawn up based on our knowledge at the time of the most recent update, as indicated. This information is intended as an aid to the user and should not be considered as a guarantee.
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All substances or mixtures can present unknown dangers and must be used with caution. We cannot guarantee that all dangers have been set out in an exhaustive manner.
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Version 6, 2015	
1. Title GES 2 Metal surface treatment: nickel electroplating, nickel electroforming, electroless nickel plating	
Life cycle	Use of nickel sulphamate in metal surface treatment
Free short title	Use of nickel sulphamate in metal surface treatment
Systematic title based on use descriptor	<p>SU: SU 3: Industrial use SU 17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment</p> <p>PC: PC 14: Metal surface treatment products, including galvanic and electroplating products</p> <p>ERC: ERC 5: Industrial use resulting in inclusion into or onto a matrix</p> <p>PROC: PROC 3: Use in closed batch process (synthesis or formulation) PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC: 5 Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact) PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 9: Transfer of chemicals into small containers (dedicated filling line) PROC 13: Treatment of articles by dipping and pouring PROC 15: Use as a laboratory reagent PROC 0: Cleaning and maintenance</p>
Processes, tasks, activities covered (environment)	Use of nickel sulphamate in surface finishing and electroforming
Processes, tasks, activities covered (workers)	<p>Contributing exposure scenario ES 2.1: PROC 3, PROC 4, PROC: 5, PROC 8a: PROC 8b, PROC 9, PROC 13, PROC 15: Use of nickel sulphamate in surface finishing and electroforming</p> <ul style="list-style-type: none"> - Raw materials handling - Preparation of Ni(SO₃.NH₂)₂ solution by diluting a concentrated Ni(SO₃.NH₂)₂ solution or dissolving Ni(SO₃.NH₂)₂.4H₂O powder in water - Addition of Ni(SO₃.NH₂)₂ and Ni(SO₃.NH₂)₂.4H₂O to tank solution during replenishment/ dosing - Dipping items with surfaces to be cleaned, prepared and coated into solutions - Tank rinsing and manual hosing down treated of coated items - Attaching workpieces to jigs or loading them into barrels - Removal of coated items from jigs or barrels - Removal and treatment of spent solution and dirty rinse water from tanks - Testing solution composition - (Polishing the plate on coated workpieces) - Testing the quality and thickness of the plate - Packaging of finished items <p>Contributing exposure scenario ES 2.2: PROC 0: - Cleaning and maintenance of plant and premises and of treatment baths for Nickel electroplating without topcoat, Nickel electroplating with chromium topcoat, Nickel electroplating with other topcoats such as gold, silver, brass, and organic compounds, Nickel electroforming, Electroless nickel plating e.g. nickel boron alloy and Nickel composite/alloy electroplating such as nickel plus silicon carbide</p>
2. Operational conditions and risk management measures	
2.1 Control of environmental exposure	
Environmental related free short title	Use of nickel sulphamate in metal surface treatment

Systematic title based on use descriptor (environment)	ERC5: Industrial use resulting in inclusion into or onto a matrix
Processes, tasks, activities covered (environment)	Metal surface treatment – nickel electroplating, nickel electroforming, electroless nickel plating.
Environmental Assessment Method	Estimates based on monitoring local and regional concentrations are used for calculation of PEC
Product characteristics	
Powder and liquid (solution of Ni(SO ₃ .NH ₂) ₂)	
Amounts used	
Maximum daily use at a site	ES 1: 0.036 tonnes/day (median 50 th % emission days) ES 2: 0.017 tonnes/day (median 50 th % emission days) ES 3: 0.036 tonnes/day (median 50 th % emission days)
Maximum annual use at a site	ES 1: 8 tonnes Ni; Discharge to STP ES 2: 3.8 tonnes Ni; Direct discharge ES 3: 8 tonnes Ni; Marine discharge
Frequency and duration of use	
Pattern of release to the environment	Water: 240 days per year per site (median 50 th %) Air: 220 days per year per site (median 50 th %)
Environment factors not influenced by risk management	
Receiving surface water flow rate	ES 1 discharge to STP: 1.8xE4 m ³ /d (Effluent STP: 2000 m ³ /d) ES 2 direct discharge: 1.2xE4 m ³ /d (Effluent Site: 250 m ³ /d)
Dilution capacity, freshwater	ES 1: 10 (default) ES 2: 50
Dilution capacity, marine	ES 3: 100 (default)
Other given operational conditions affecting environmental exposure	
None	
Technical conditions and measures at process level (source) to prevent release	
None	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Waste water: On-site wastewater treatment in a physico-chemical treatment plant by chemical precipitation, sedimentation, filtration or a combination. (Efficiency: 95 - >99%) Off-site waste water treatment plant, community sewer system for ES 1 (Efficiency 40%) ES1 freshwater discharge to STP: 3779 g/T (median) ES2 freshwater direct discharge: 3779 g/T (median) ES3 marine direct discharge: 3779 g/T (median)	
Air: Treatment of stack air emission by wet scrubbers. (Efficiency 99%) ES1, 2 & 3: Release factor after on-site treatment: 1133 g/T (median)	
Organizational measures to prevent/limit release from site	
None	
Conditions and measures related to municipal sewage treatment plant	
Municipal Sewage Treatment Plant (STP)	Yes
Discharge rate of the Municipal STP	2000 m ³ /d (default)
Incineration of the sludge of the Municipal STP	Sludge is applied to agricultural soil
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:	
<ul style="list-style-type: none"> - 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 for contributing exposure scenario 2.1

Nickel electroplating, nickel electroforming & electroless nickel plating

Workers related free short title	Use of nickel sulphamate in metal surface treatment
Use descriptor covered	PROC 3: Use in closed batch process (synthesis or formulation) PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arise PROC: 5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 9: Transfer of chemicals into small containers (dedicated filling line) PROC 13: Treatment of articles by dipping and pouring PROC 15: Use as a laboratory reagent
Processes, tasks, activities covered	Raw materials handling Preparation of Ni(SO ₃ .NH ₂) ₂ solution by diluting a concentrated Ni(SO ₃ .NH ₂) ₂ solution Addition Ni(SO ₃ .NH ₂) ₂ solution to a tank solution during replenishment Dipping items with surfaces to be cleaned, prepared and coated into solutions Rinsing treated and coated items Removal of coated items from jigs or barrels Removal and treatment of spent solution and dirty rinse water from tanks Testing working solution composition Testing the quality and thickness of the plate Packaging of finished items
Assessment Method	Estimation of dermal exposure using a Tier 1 model (MEASE)
Product characteristic	
	Ni(SO ₃ .NH ₂) ₂ solution and Ni(SO ₃ .NH ₂) ₂ .4H ₂ O powder
Amounts used	
	Not relevant
Frequency and duration of use/exposure	
	Plating process continuous over every shift Frequency of additions to tank depends on process and through-put rate of plated items down the line and ranges from once per shift to once every 2 or 3 weeks.
Human factors not influenced by risk management	

Respiration volume under conditions of use	Light to medium level work is routinely undertaken ~10 m ³ /d
Room size and ventilation rate	Not relevant
Area of skin contact with the substance under conditions of use	240, 480 & 960 cm ² depending on task
Body weight	70 kg
Other given operational conditions affecting workers exposure	
Ni plating solutions are often used hot and this can cause mist emissions from the solution surface. Manual solution make-up and replenishment with Ni(SO ₃ .NH ₂) ₂ solution can lead to solution splashes to the skin and generate spray in the atmosphere.	
Technical conditions and measures at process level (source) to prevent release	
Treatment solutions contain a fume suppressant and/or are covered with a layer of plastic balls floating on the solution surface to seal heat and mist inside plating tank where this barrier will allow easy immersion and removal of items and access to other tank fittings. Treatment solutions not in use are sealed with tank covers. The Ni(SO ₃ .NH ₂) ₂ solution is carefully added to the tank solution where the process is not automated, in order to avoid throwing the Ni(SO ₃ .NH ₂) ₂ along the length of the tanks and creating liquid splashes and solution spray.	
Technical conditions and measures to control dispersion from source towards the worker	
LEV shall be used to extract the mist and particulate during the solution mixing, dipping and transferring operations which are not fully enclosed.	
Organisational measures to prevent /limit releases, dispersion and exposure	
Training to reinforce good practice and hygiene issues.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Air-assisted filtering visor, masks or hood with P3 filter element (Assigned Protection Factor ~20 based on use of powered respirator meeting EN12492 requirement or FFP3 (EN149) or equivalent suitable respirator) is required for emergencies and non-routine tasks where exposure to Ni(SO ₃ .NH ₂) ₂ containing mist or dust is possible. Chemical gloves with EN 374, protection level 6 are required to control dermal exposure when carrying out and process operations on the line.	
2.3 Control of workers exposure for contributing exposure scenario 2.2	
Cleaning and Maintenance	
Workers related free short title	Use of nickel sulphamate in metal surface treatment
Use descriptor covered	PROC: 0 Cleaning and maintenance PROC: 5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
Processes, tasks, activities covered	Cleaning and maintenance of plant, solutions (preparation of Ni(SO ₃ .NH ₂) ₂ solution from Ni(SO ₃ .NH ₂) ₂ .4H ₂ O & addition Ni(SO ₃ .NH ₂) ₂ .4H ₂ O to tank solution during replenishment) and premises
Assessment Method	Estimation of exposure using a Tier 1 model (MEASE)
Product characteristic	
Ni/ Ni(SO ₃ .NH ₂) ₂ -containing powder and Ni(SO ₃ .NH ₂) ₂ 4 solution	
Amounts used	
Not relevant	
Frequency and duration of use/exposure	
Duration of exposure during cleaning and maintenance is considered to average 1 hour per day for surface finishing including tank emptying, refilling tank solutions and replenishing tank solutions. Frequency of addition of salts to tank depends on process and through-put rate of plated items down the line and ranges from once per shift to once every 2 or 3 weeks.	
Human factors not influenced by risk management	
Respiration volume under conditions of use	Light to medium level work is routinely undertaken ~10 m ³ /d
Room size and ventilation rate	Not relevant
Area of skin contact with the substance under conditions of use	960 cm ²
Body weight	70 kg
Other given operational conditions affecting workers exposure	
None	
Technical conditions and measures at process level (source) to prevent release	
The Ni(SO ₃ .NH ₂) ₂ .4H ₂ O powder is carefully added to the tank solution where the process is not automated, in order to avoid throwing the Ni(SO ₃ .NH ₂) ₂ .4H ₂ O powder along the length of the tanks and creating liquid splashes and powder becoming airborne.	

Technical conditions and measures to control dispersion from source towards the worker

Local (where appropriate) and general exhaust ventilation.
 Vacuuming or suitable wet removal methods for cleaning settled dust etc. from plant and premises. Avoid inappropriate cleaning methods such as dry brushing.

Organisational measures to prevent /limit releases, dispersion and exposure

Regular training in good work hygiene practices and proper use of PPE.

Conditions and measures related to personal protection, hygiene and health evaluation

Inhalation to mists and particulates and skin exposure to mists, liquids splashes and particulates shall be controlled by RPE and gloves when undertaking maintenance and cleaning work.

Inhalation: Use of air-assisted filtering visor, masks or hood with P3 filter element for plant or premises heavily contaminated with nickel-containing dust or spills {APF 20 or 40 based on use of powered respirator meeting EN12492 or EN12941 requirement or FFP3 (EN136) or equivalent suitable respirator}. RPE with a lower APF of 10 {air-assisted filtering visor, masks or hood with P2 filter element including powered respirators meeting the EN12492 TM1 or EN 12941 TH1 requirement or the FFP2 (EN149) or equivalent suitable respirator} may be used for cleaning and maintenance work where the plant or premises is less heavily contaminated with nickel-containing dust or spills. It is important to note that the disposable mask FFP1 (with APF = 4) is not recommended for use with Ni-containing dust.

Dermal: Use of suitable chemical gloves (EN 374, protection level 6, PVC or equivalent) goggles and special safety clothing is required to control dermal exposure Protective equipment should be chosen based on activities being undertaken, potential for exposure to airborne Ni(SO₃.NH₂)₂ and other relevant workplace hazards and may include protective suit with hood (conforming to EN13982-1 Type 5), safety shoes (e.g. according to EN 20346).

3. Exposure and risk estimation

Environment

ERC 5 Metal surface treatment– nickel electroplating, nickel electroforming, electroless nickel plating							
Compartment	Unit	PNEC	PEC _{Regional}	C _{local}	PEC	RCR	Methods for calculation of environmental concentrations
ES 1: Freshwater STP discharge							Measured values, Tier 3-RWC
Freshwater	µg Ni/L	7.1	2.9	2.71	5.61	0.79	
STP	mg Ni/L	0.33	-	-	0.038	0.12	
Sediment	mg Ni/kg	136	33.5	71.3	104.8	0.77	
Terrestrial	mg Ni/kg	29.9	16.2	1.18	17.38	0.58	
ES 2: Freshwater direct discharge							
Freshwater	µg Ni/L	7.1	2.9	3.43	6.33	0.89	
Sediment	mg Ni/kg	136	33.5	90.3	123.8	0.91	
Terrestrial	mg Ni/kg	29.9	16.2	< 0.01	16.20	0.54	
ES 3: Marine direct discharge							
Marine water	µg Ni/L	8.6	0.3	3.61	3.91	0.46	
Sediment	mg Ni/kg	136	16.1	95.0	111.1	0.82	
Terrestrial	mg Ni/kg	29.9	16.2	< 0.01	16.20	0.54	

Workers

ES 2.1 PROC 3, 4, 5, 8a, 8b, 9, 13 & 15: Nickel electroplating, nickel electroforming & electroless nickel plating					
	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	0.00044	0.00003	0.0682	90 th percentile exposure estimate using MEASE for PROC 8 (Ni content >25% of solution, inclusion into matrix, incidental exposure, non-direct handling, duration 8 hours, LEV, gloves)

Inhalation					
Acute systemic	mg Ni/m ³	16	0.06	0.038	3 x long-term exposure estimate
Acute local	mg Ni/m ³	0.7	0.06	0.086	
Long-term systemic and local	mg Ni/m ³	0.05	0.02	0.4	75 th percentile value from 57 personal exposure measurements

ES 2.2

PROC 0: Cleaning and maintenance of plant, solutions and premises

	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	0.00044	0.000006	0.014	90 th percentile exposure estimate using MEASE for PROC 10 {Ni content >25% of powder, incidental exposure, non-direct handling, duration 1 hour, general ventilation, RPE, gloves}
Inhalation					
Acute systemic	mg Ni/m ³	16	1.71	0.11	3 x long-term inhalable modeled estimate
Acute local	mg Ni/m ³	0.7	1.71 0.171	2.44 (excluding RPE) 0.244 By use of RPE (APF 10)	
Long-term systemic and local	mg Ni/m ³	0.05	0.57 0.029	11.4 (excluding RPE) 0.57 By use of RPE (APF = 20)	90 th percentile exposure estimate using MEASE for PROC 10 {Ni content >25% of powder, incidental exposure, non-direct handling, duration 1 hour, general ventilation, RPE, gloves} Many plating shops operate multiple plating lines with different electrolyte composition. This means that plating from Ni(SO ₃ .NH ₂) ₂ will possibly be carried out next to plating from a Watts nickel bath. Therefore NiSO ₄ and NiCl ₂ will be present in airborne and settled dust and this will likely give rise to inhalation and dermal exposure. Therefore appropriate PPE will be required i.e. RPE with a minimum APF=20.

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 evaluate whether a site 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 (e.g., ≤10% of nickel mass in respirable fraction). 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 metal surface treatment: nickel electroplating, nickel electroforming, electroless nickel plating

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