



## NiTINOL

### Safety Data Sheet

### Nitinol alloys

Safety Data Sheet dated 05/05/2014, version 2

#### 1. IDENTIFICATION

Product identifier

Mixture identification:

Trade name: Nitinol alloys

Other means of identification:

Document number : RBSDSU080421

Recommended use of the chemical and restrictions on use

Recommended use:

shape memory alloy

Restrictions on use:

All uses not listed as recommended

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Company Information:

Malin Co.

5400 Smith Road

Brook Park, Ohio 44142

Telephone: (216) 267-9080

Fax: (216) 267-9077

Emergency phone number

CHEMTRECH PHONE

+1 (800) 424-9300 (US emergencies)

+1 703 527 3887 (international emergencies)

#### 2. HAZARD(S) IDENTIFICATION

Classification of the chemical

 Warning, Skin Sens. 1, May cause an allergic skin reaction.

 Warning, Carc. 2, Suspected of causing cancer.

 Danger, STOT RE 1, Causes damage to organs through prolonged or repeated exposure.

Label elements

Symbols:



Danger

Hazard statements:

H317 May cause an allergic skin reaction.

H351 Suspected of causing cancer.

Precautionary statements:

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P264 Wash hands thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P281 Use personal protective equipment as required.

P314 Get medical advice/attention if you feel unwell.



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P333+P313 If skin irritation or rash occurs: Get medical advice/attention.  
P363 Wash contaminated clothing before reuse.  
P501 Dispose of contents/container in accordance with applicable regulations.

### Special Provisions:

None

Hazards not otherwise classified identified during the classification process:

None

Ingredient(s) with unknown acute toxicity:

None.

Additional classification information

NFPA rating:



HMIS rating:

HEALTH	* 1
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	B

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances

N.A.

Mixtures

Hazardous components within the meaning of 29 CFR 1910.1200 and related classification:

$\geq$  40% - < 60% nickel

Index number: 028-002-00-7, CAS: 7440-02-0, EC: 231-111-4

A.6/2 Carc. 2 H351

A.9/1 STOT RE 1 H372

< 3% cobalt

Index number: 027-001-00-9, CAS: 7440-48-4, EC: 231-158-0

A.4.1/1 Resp. Sens. 1 H334

A.4.2/1 Skin Sens. 1 H317

US-HAE/C4 Aquatic Chronic 4 H413

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### 4. FIRST-AID MEASURES

Description of necessary measures

In case of skin contact:

Areas of the body that have come into prolonged contact with the product must be rinsed with plenty of running water and possibly with soap.

In case of eyes contact:

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

In case of Ingestion:

Ingestion is a very unlikely way of exposure

Do not under any circumstances induce vomiting. OBTAIN A MEDICAL EXAMINATION IMMEDIATELY.

In case of Inhalation:

Inhalation is a very unlikely way of exposure

If breathing is irregular or stopped, administer artificial respiration.

In case of inhalation, consult a doctor immediately and show him packing or label.

Most important symptoms/effects, acute and delayed

None

Indication of immediate medical attention and special treatment needed

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

Treatment:

None

### 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:

Special powder for metal fires. CO2 or Dry chemical fire extinguisher.

Unsuitable extinguishing media:

None

Specific hazards arising from the chemical

Do not inhale explosion and combustion gases.

Hazardous combustion products:

None

Explosive properties:

Not Relevant

Oxidizing properties:

Not Relevant

Special protective equipment and precautions for fire-fighters

Use suitable breathing apparatus.

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Move undamaged containers from immediate hazard area if it can be done safely.

### 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures

Wear personal protection equipment.

Wear breathing apparatus if exposed to vapours/dusts/aerosols.

Provide adequate ventilation.

Use appropriate respiratory protection.

See protective measures under point 7 and 8.

Methods and materials for containment and cleaning up

Clean up contaminate area and avoid creating dust.

Properly package all spill residue in an UN approved container

### 7. HANDLING AND STORAGE



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#### Precautions for safe handling

- Avoid contact with skin and eyes, inhalation of vapours and mists.
- Before making transfer operations, assure that there aren't any incompatible material residuals in the containers.
- Contaminated clothing should be changed before entering eating areas
- Do not eat or drink while working.
- See also section 8 for recommended protective equipment.

#### Conditions for safe storage, including any incompatibilities

- Keep away from food, drink and feed.
- Incompatible materials:  
None in particular.
- Instructions as regards storage premises:  
Adequately ventilated premises.
- Storage temperature:  
Store at ambient temperature.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Control parameters

- nickel - CAS: 7440-02-0  
OSHA - STE: 1 mg/m<sup>3</sup>  
ACGIH - LTE(8h): 1,5 mg/m<sup>3</sup> - Notes: A5, (I) - Dermatitis, pneumoconiosis
- cobalt - CAS: 7440-48-4  
ACGIH - LTE(8h): 0,02 mg/m<sup>3</sup> - Notes: A3, BEI - Asthma, pulm func, myocardial eff

#### DNEL Exposure Limit Values

N.A.

#### PNEC Exposure Limit Values

N.A.

#### Appropriate engineering controls:

None

#### Individual protection measures

##### Eye protection:

Use close safety glasses, don't use eye lens.

##### Protection for skin:

Use clothing that provides comprehensive protection to the skin, e.g cotton, rubber, PVC or viton.

##### Protection for hands:

Use of protective gloves that provides comprehensive protection, e.g P.V.C., neoprene or rubber is recommended.

##### Respiratory protection:

Use adequate protective respiratory equipment.

##### Thermal Hazards:

None

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Odour:	Not Relevant
Odour threshold:	Not Relevant
pH:	Not Relevant
Melting point / freezing point:	>1000°C
Initial boiling point and boiling range:	Not Relevant
Solid/gas flammability:	Not Relevant

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Upper/lower flammability or explosive limits:	Not Relevant
Vapour density:	Not Relevant
Flash point:	Not Relevant
Flash point:	N.A. ° F
Evaporation rate:	Not Relevant
Vapour pressure:	Not Relevant
Relative density:	6,4 g/cm <sup>3</sup>
Solubility in water:	Not Relevant
Solubility in oil:	Not Relevant
Partition coefficient (n-octanol/water):	Not Relevant
Auto-ignition temperature:	Not Relevant
Decomposition temperature:	Not Relevant
Viscosity:	Not Relevant
Miscibility:	Not Relevant
Fat Solubility:	Not Relevant
Conductivity:	Not Relevant

#### 10. STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions
Chemical stability	Stable under normal conditions
Possibility of hazardous reactions	It may generate flammable gases, on contact with mineral acids.
Conditions to avoid	Stable under normal conditions.
Incompatible materials	None in particular.
Hazardous decomposition products	None.

#### 11. TOXICOLOGICAL INFORMATION

Information on toxicological effects	
Toxicological information of the mixture:	N.A.
Toxicological information of the main substances found in the mixture:	N.A.
Substance(s) listed on the NTP report on Carcinogens:	None.
Substance(s) listed on the IARC Monographs:	nickel - Group 2B.
Substance(s) listed as OSHA Carcinogen(s):	None.
Substance(s) listed as NIOSH Carcinogen(s):	None.

#### 12. ECOLOGICAL INFORMATION

Ecotoxicity	Adopt good working practices, so that the product is not released into the environment.
	N.A.
Persistence and degradability	N.A.
Bioaccumulative potential	

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N.A.  
Mobility in soil  
N.A.  
Other adverse effects  
None

### 13. DISPOSAL CONSIDERATIONS

Waste treatment and disposal methods

Recover, if possible. Send to authorised Treatment, Storage, and Disposal Facility or for incineration under controlled conditions. In so doing, comply with the local and national regulations currently in force.

### 14. TRANSPORT INFORMATION

UN number  
Not classified as dangerous in the meaning of transport regulations.  
UN proper shipping name  
N.A.  
Transport hazard class(es)  
N.A.  
Packing group  
N.A.  
Environmental hazards  
ADR-Environmental Pollutant: No  
IMDG-Marine pollutant: No  
Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)  
N.A.  
Special precautions  
N.A.

### 15. REGULATORY INFORMATION

USA - Federal regulations

TSCA - Toxic Substances Control Act

TSCA inventory: all the components are listed on the TSCA inventory.

TSCA listed substances:

None.

SARA - Superfund Amendments and Reauthorization Act

Section 302 – Extremely Hazardous Substances: no substances listed.

Section 304 – Hazardous substances: no substances listed.

Section 313 – Toxic chemical list: nickel, cobalt.

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

Substance(s) listed under CERCLA: nickel - Reportable quantity: 100 pounds.

Reportable quantity for mixture: 222.222222 pounds.

CAA - Clean Air Act

CAA listed substances:

nickel is listed in CAA Section 112(b) - HAP

cobalt is listed in CAA Section 112(b) - HAP.

CWA - Clean Water Act

CWA listed substances:

nickel is listed in CWA Section 307.

USA - State specific regulations

California Proposition 65

Substance(s) listed under California Proposition 65:

nickel - Listed as carcinogen.

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Massachusetts Right to know  
Substance(s) listed under Massachusetts Right to know:  
nickel  
cobalt.

New Jersey Right to know  
Substance(s) listed under New Jersey Right to know:  
nickel  
cobalt.

Pennsylvania Right to know  
Substance(s) listed under Pennsylvania Right to know:  
nickel  
cobalt.

### 16. OTHER INFORMATION

Full text of phrases referred to in Section 3:  
H351 Suspected of causing cancer.  
H317 May cause an allergic skin reaction.

Safety Data Sheet dated 12/15/2014, version 1  
Disclaimer:

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality. The information relates only to the specific material and may not be valid for such material used in combination with any other material or in any process.

This Safety Data Sheet cancels and replaces any preceding release.

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.

CAS: Chemical Abstracts Service (division of the American Chemical Society).

CLP: Classification, Labeling, Packaging.

DNEL: Derived No Effect Level.

EINECS: European Inventory of Existing Commercial Chemical Substances.

GHS: Globally Harmonized System of Classification and Labeling of Chemicals.

HMIS: Hazardous Materials Identification System

IARC: International Agency for Research on Cancer

IATA: International Air Transport Association.

IATA-DGR: Dangerous Goods Regulation by the "International Air Transport Association" (IATA).

ICAO: International Civil Aviation Organization.

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO).

IMDG: International Maritime Code for Dangerous Goods.

INCI: International Nomenclature of Cosmetic Ingredients.

KSt: Explosion coefficient.

LC50: Lethal concentration, for 50 percent of test population.

LD50: Lethal dose, for 50 percent of test population.

LTE: Long-term exposure.

NFPA: National Fire Protection Association

NIOSH: National Institute for Occupational Safety and Health

NTP: National Toxicology Program

OSHA: Occupational Safety and Health Administration

PNEC: Predicted No Effect Concentration.

RID: Regulation Concerning the International Transport of Dangerous Goods

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	by Rail.
STE:	Short-term exposure.
STEL:	Short Term Exposure limit.
STOT:	Specific Target Organ Toxicity.
TLV:	Threshold Limiting Value.
TWATLV:	Threshold Limit Value for the Time Weighted Average 8 hour day (ACGIH Standard).