



# SAFETY DATA SHEET

MATERION

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

### 1.1. Product identifier

**Trade name or designation of the mixture** Silver Based Products  
**Synonyms** None.  
**Document number** W13  
**Issue date** 05-May-2015  
**Version number** 02  
**Revision date** 07-July-2015  
**Supersedes date** 05-May-2015

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

**Identified uses** Not available.  
**Uses advised against** None known.

### 1.3. Details of the supplier of the safety data sheet

#### Supplier

**Company name** Materion Advanced Materials Technologies and Services Inc.  
**Address** 2978 Main Street  
Buffalo, NY 14214  
United States  
**Division** Buffalo  
**Telephone** 716-837-1000  
**e-mail** Not available.  
**Contact person** Not available.

**1.4. Emergency telephone number** 800-424-9300 Chemtrec

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

**Classification according to Directive 67/548/EEC or 1999/45/EC as amended**

**Classification** N;R50/53

**Classification according to Regulation (EC) No 1272/2008 as amended**

#### Health hazards

Carcinogenicity Category 2 H351 - Suspected of causing cancer.

#### Environmental hazards

Hazardous to the aquatic environment, acute aquatic hazard Category 1 H400 - Very toxic to aquatic life.  
Hazardous to the aquatic environment, long-term aquatic hazard Category 1 H410 - Very toxic to aquatic life with long lasting effects.

#### Hazard summary

**Physical hazards** Not classified for physical hazards.  
**Health hazards** Not classified for health hazards.  
**Environmental hazards** Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.  
**Specific hazards** Not available.

### 2.2. Label elements

**Label according to Regulation (EC) No. 1272/2008 as amended**

**Contains:** Copper, Nickel, Silver, Tin, Zinc  
**Hazard pictograms** None.  
**Signal word** Warning  
**Hazard statements**  
H351 Suspected of causing cancer.

H400 Very toxic to aquatic life.  
H410 Very toxic to aquatic life with long lasting effects.

## Precautionary statements

### Prevention

P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.

### Response

P308 + P313 IF exposed or concerned: Get medical advice/attention.  
P391 Collect spillage.

### Storage

P405 Store locked up.

### Disposal

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

## Supplemental label information

6,48 % of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 6,48 % of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

**2.3. Other hazards** None known.

## SECTION 3: Composition/information on ingredients

### 3.2. Mixtures

#### General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Silver	49 - < 96	7440-22-4 231-131-3	-	-	# M=1000
<b>Classification:</b>	<b>DSD:</b> N;R50/53				
	<b>CLP:</b> Aquatic Acute 1;H400, Aquatic Chronic 1;H410				
Copper	16 - < 28	7440-50-8 231-159-6	-	-	M=100
<b>Classification:</b>	<b>DSD:</b> N;R50/53				
	<b>CLP:</b> Aquatic Acute 1;H400, Aquatic Chronic 1;H410				
Zinc	4 - < 28	7440-66-6 231-175-3	-	-	
<b>Classification:</b>	<b>DSD:</b> -				
	<b>CLP:</b> Water-React. 3;H261				
Tin	1 - < 15	7440-31-5 231-141-8	-	-	#
<b>Classification:</b>	<b>DSD:</b> -				
	<b>CLP:</b> -				
Nickel	2 < 8	7440-02-0 231-111-4	-	-	M=10
<b>Classification:</b>	<b>DSD:</b> N;R50/53				
	<b>CLP:</b> Carc. 2;H351, Aquatic Acute 1;H400, Aquatic Chronic 3;H412				

## SECTION 4: First aid measures

**General information** Not available.

### 4.1. Description of first aid measures

**Inhalation** Not available.

**Skin contact** Not available.

**Eye contact** Not available.

<b>Ingestion</b>	Not available.
<b>4.2. Most important symptoms and effects, both acute and delayed</b>	Not available.
<b>4.3. Indication of any immediate medical attention and special treatment needed</b>	Not available.

## SECTION 5: Firefighting measures

<b>General fire hazards</b>	Not available.
<b>5.1. Extinguishing media</b>	
<b>Suitable extinguishing media</b>	Not available.
<b>Unsuitable extinguishing media</b>	Not available.
<b>5.2. Special hazards arising from the substance or mixture</b>	Not available.
<b>5.3. Advice for firefighters</b>	
<b>Special protective equipment for firefighters</b>	Not available.

## SECTION 6: Accidental release measures

<b>6.1. Personal precautions, protective equipment and emergency procedures</b>	
<b>For non-emergency personnel</b>	Not available.
<b>For emergency responders</b>	Not available.
<b>6.2. Environmental precautions</b>	Not available.
<b>6.3. Methods and material for containment and cleaning up</b>	Not available.
<b>6.4. Reference to other sections</b>	Not available.

## SECTION 7: Handling and storage

<b>7.1. Precautions for safe handling</b>	Not available.
<b>7.2. Conditions for safe storage, including any incompatibilities</b>	Not available.
<b>7.3. Specific end use(s)</b>	Not available.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Occupational exposure limits

##### Austria. MAK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001

Components	Type	Value	Form
Copper (CAS 7440-50-8)	MAK	1 mg/m <sup>3</sup>	Inhalable fraction.
		0,1 mg/m <sup>3</sup>	Fume and respirable dust.
	STEL	4 mg/m <sup>3</sup>	Inhalable fraction.
		0,4 mg/m <sup>3</sup>	Fume and respirable dust.
Silver (CAS 7440-22-4)	MAK	0,1 mg/m <sup>3</sup>	Inhalable fraction.
	STEL	0,1 mg/m <sup>3</sup>	Inhalable fraction.
Tin (CAS 7440-31-5)	MAK	2 mg/m <sup>3</sup>	Inhalable fraction.
	STEL	4 mg/m <sup>3</sup>	Inhalable fraction.

##### Austria. TRK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001

Components	Type	Value	Form
Nickel (CAS 7440-02-0)	STEL	2 mg/m <sup>3</sup>	Inhalable dust.
	TWA	0,5 mg/m <sup>3</sup>	Inhalable dust.

**Belgium. Exposure Limit Values.**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup> 0,2 mg/m <sup>3</sup>	Dust and mist. Fume.
Nickel (CAS 7440-02-0)	TWA	1 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	

**Bulgaria. OELs. Regulation No 13 on protection of workers against risks of exposure to chemical agents at work**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	0,1 mg/m <sup>3</sup>	
Nickel (CAS 7440-02-0)	TWA	0,05 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	0,1 mg/m <sup>3</sup>	

**Croatia. Dangerous Substance Exposure Limit Values in the Workplace (ELVs), Annexes 1 and 2, Narodne Novine, 13/09**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	MAC STEL	0,21 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	Dust and fume. Dust and fume.
Nickel (CAS 7440-02-0)	MAC	0,5 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	MAC	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	MAC	2 mg/m <sup>3</sup>	

**Cyprus. OELs. Control of factory atmosphere and dangerous substances in factories regulation, PI 311/73, as amended.**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	0,2 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	TWA	1 mg/m <sup>3</sup>	

**Czech Republic. OELs. Government Decree 361**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	Ceiling TWA	2 mg/m <sup>3</sup> 0,2 mg/m <sup>3</sup> 1 mg/m <sup>3</sup> 0,1 mg/m <sup>3</sup>	Dust. Fume. Dust. Fume.
Nickel (CAS 7440-02-0)	Ceiling TWA	1 mg/m <sup>3</sup> 0,5 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	Ceiling TWA	0,3 mg/m <sup>3</sup> 0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	Ceiling TWA	4 mg/m <sup>3</sup> 2 mg/m <sup>3</sup>	

**Denmark. Exposure Limit Values**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TLV	1 mg/m <sup>3</sup> 0,1 mg/m <sup>3</sup>	Dust. Fume.
Nickel (CAS 7440-02-0)	TLV	0,05 mg/m <sup>3</sup>	Dust.
Silver (CAS 7440-22-4)	TLV	0,01 mg/m <sup>3</sup>	Dust.

**Estonia. OELs. Occupational Exposure Limits of Hazardous Substances. (Annex of Regulation No. 293 of 18 September 2001)**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup> 0,2 mg/m <sup>3</sup>	Total dust. Respirable dust.
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	

**Finland. Workplace Exposure Limits**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup> 0,1 mg/m <sup>3</sup>	Respirable dust and/or fume.
Nickel (CAS 7440-02-0)	TWA	0,01 mg/m <sup>3</sup>	Respirable.
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	

**France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	VLE	2 mg/m <sup>3</sup>	Dust.
	VME	1 mg/m <sup>3</sup>	Dust.
		0,2 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	VME	1 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	VME	0,1 mg/m <sup>3</sup>	

**Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG)**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	0,01 mg/m <sup>3</sup>	Respirable fraction.
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	Inhalable fraction.
Tin (CAS 7440-31-5)	TWA	0,02 mg/m <sup>3</sup>	Vapor and aerosol, inhalable fraction.
		0,004 ppm	Vapor and aerosol, inhalable fraction.
Zinc (CAS 7440-66-6)	TWA	2 mg/m <sup>3</sup>	Inhalable fraction.
		0,1 mg/m <sup>3</sup>	Respirable fraction.

**Germany. TRGS 900, Limit Values in the Ambient Air at the Workplace**

Components	Type	Value	Form
Silver (CAS 7440-22-4)	AGW	0,1 mg/m <sup>3</sup>	Inhalable fraction.

**Greece. OELs (Decree No. 90/1999, as amended)**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	STEL	2 mg/m <sup>3</sup>	Dust.
	TWA	1 mg/m <sup>3</sup>	Dust.
		0,2 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	TWA	1 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	

**Hungary. OELs. Joint Decree on Chemical Safety of Workplaces**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	STEL	4 mg/m <sup>3</sup>	
		0,4 mg/m <sup>3</sup>	Smoke.
	TWA	1 mg/m <sup>3</sup>	
Nickel (CAS 7440-02-0)	Ceiling	0,1 mg/m <sup>3</sup>	Smoke.
		0,1 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	STEL	0,4 mg/m <sup>3</sup>	
	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	STEL	8 mg/m <sup>3</sup>	
	TWA	2 mg/m <sup>3</sup>	

**Iceland. OELs. Regulation 154/1999 on occupational exposure limits**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup>	Total dust.
		0,1 mg/m <sup>3</sup>	Respirable dust.
Nickel (CAS 7440-02-0)	TWA	0,05 mg/m <sup>3</sup>	Dust.
Silver (CAS 7440-22-4)	TWA	0,01 mg/m <sup>3</sup>	Dust.

**Ireland. Occupational Exposure Limits**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	STEL	2 mg/m <sup>3</sup>	Dust and mist.
	TWA	1 mg/m <sup>3</sup>	Dust and mist.
		0,2 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	

**Italy. Occupational Exposure Limits**

Components	Type	Value	Form
Nickel (CAS 7440-02-0)	TWA	1,5 mg/m <sup>3</sup>	Inhalable fraction.
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	

**Latvia. OELs. Occupational exposure limit values of chemical substances in work environment**

Components	Type	Value
Copper (CAS 7440-50-8)	STEL	1 mg/m <sup>3</sup>
	TWA	0,5 mg/m <sup>3</sup>
Nickel (CAS 7440-02-0)	TWA	0,05 mg/m <sup>3</sup>
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>

**Lithuania. OELs. Limit Values for Chemical Substances, General Requirements**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup>	Inhalable fraction.
		0,2 mg/m <sup>3</sup>	Respirable fraction.
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	

**Malta. OELs. Occupational Exposure Limit Values (L.N. 227. of Occupational Health and Safety Authority Act (CAP. 424), Schedules I and V)**

Components	Type	Value
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>

**Netherlands. OELs (binding)**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	0,1 mg/m <sup>3</sup>	Inhalable fraction.
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	

**Norway. Administrative Norms for Contaminants in the Workplace**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TLV	1 mg/m <sup>3</sup>	Dust.
		0,1 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	TLV	0,05 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TLV	0,1 mg/m <sup>3</sup>	Dust and fume.
Tin (CAS 7440-31-5)	TLV	2 mg/m <sup>3</sup>	

**Poland. MACs. Minister of Labour and Social Policy Regarding Maximum Allowable Concentrations and Intensities in Working Environment**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	0,2 mg/m <sup>3</sup>	
Nickel (CAS 7440-02-0)	TWA	0,25 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	0,05 mg/m <sup>3</sup>	Inhalable fraction.
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	Inhalable fraction.

**Portugal. OELs. Decree-Law n. 290/2001 (Journal of the Republic - 1 Series A, n.266)**

Components	Type	Value
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>

**Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796)**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup>	Dust and mist.
		0,2 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	TWA	1,5 mg/m <sup>3</sup>	Inhalable fraction.
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	

**Romania. OELs. Protection of workers from exposure to chemical agents at the workplace**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	STEL	1,5 mg/m <sup>3</sup>	Dust.
		0,2 mg/m <sup>3</sup>	Fume.
		0,5 mg/m <sup>3</sup>	Dust.
Nickel (CAS 7440-02-0)	STEL	0,5 mg/m <sup>3</sup>	
		0,1 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	

**Slovakia. OELs. Regulation No. 300/2007 concerning protection of health in work with chemical agents**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup>	Inhalable fraction.
		0,2 mg/m <sup>3</sup>	Respirable fume.

**Slovakia. OELs. Regulation No. 300/2007 concerning protection of health in work with chemical agents**

Components	Type	Value	Form
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	STEL	4 mg/m <sup>3</sup>	
	TWA	2 mg/m <sup>3</sup>	
Zinc (CAS 7440-66-6)	TWA	2 mg/m <sup>3</sup>	Inhalable fraction.
		0,1 mg/m <sup>3</sup>	Respirable fraction.

**Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup>	Inhalable fraction.
		0,1 mg/m <sup>3</sup>	Respirable fume.
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m <sup>3</sup>	Inhalable fraction.
Silver (CAS 7440-22-4)	TWA	0,01 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	

**Spain. Occupational Exposure Limits**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup>	Dust and mist.
		0,2 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	TWA	1 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	

**Sweden. Occupational Exposure Limit Values**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup>	Total dust.
		0,2 mg/m <sup>3</sup>	Respirable dust.
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m <sup>3</sup>	Total dust.
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	Total dust.
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>	Inhalable dust.

**Switzerland. SUVA Grenzwerte am Arbeitsplatz**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	STEL	0,2 mg/m <sup>3</sup>	Inhalable dust.
	TWA	0,1 mg/m <sup>3</sup>	Inhalable dust.
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m <sup>3</sup>	Inhalable dust.
Silver (CAS 7440-22-4)	STEL	0,8 mg/m <sup>3</sup>	Inhalable dust.
	TWA	0,1 mg/m <sup>3</sup>	Inhalable dust.
Zinc (CAS 7440-66-6)	STEL	4 mg/m <sup>3</sup>	Inhalable dust.
		0,4 mg/m <sup>3</sup>	Respirable dust.
	TWA	2 mg/m <sup>3</sup>	Inhalable dust.
		0,1 mg/m <sup>3</sup>	Respirable dust.

**UK. EH40 Workplace Exposure Limits (WELs)**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	STEL	2 mg/m <sup>3</sup>	Inhalable dusts and mists.
	TWA	1 mg/m <sup>3</sup>	Inhalable dusts and mists.
		0,2 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m <sup>3</sup>	
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>	

**EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU**

Components	Type	Value
Silver (CAS 7440-22-4)	TWA	0,1 mg/m <sup>3</sup>
Tin (CAS 7440-31-5)	TWA	2 mg/m <sup>3</sup>

**Biological limit values****Czech Republic. Limit Values for Indicators of Biological Exposure Tests in Urine and Blood, Annex 2, Tables 1 and 2, Government Decree 432/2003 Sb.**

Components	Value	Determinant	Specimen	Sampling time
Nickel (CAS 7440-02-0)	0,077 µmol/mmol	Nickel	Creatinine in urine	*

**Czech Republic. Limit Values for Indicators of Biological Exposure Tests in Urine and Blood, Annex 2, Tables 1 and 2, Government Decree 432/2003 Sb.**

Components	Value	Determinant	Specimen	Sampling time
	0,04 mg/g	Nickel	Creatinine in urine	*

\* - For sampling details, please see the source document.

**Finland. HTP-arvot, App 2., Biological Limit Values, (BRA/BGV), Social Affairs and Ministry of Health**

Components	Value	Determinant	Specimen	Sampling time
Nickel (CAS 7440-02-0)	0,1 umol/l	Nickel	Urine	*

\* - For sampling details, please see the source document.

**Hungary. Chemical Safety at Workplace Ordinance Joint Decree No. 25/2000 (Annex 2): Permissible limit values of biological exposure (effect) indices**

Components	Value	Determinant	Specimen	Sampling time
Nickel (CAS 7440-02-0)	0,02 mg/g	Nickel	Creatinine in urine	*
	0,038 µmol/mmol	Nickel	Creatinine in urine	*

\* - For sampling details, please see the source document.

**Switzerland. BAT-Werte (Biological Limit Values in the Workplace as per SUVA)**

Components	Value	Determinant	Specimen	Sampling time
Nickel (CAS 7440-02-0)	45 µg/l	Nickel	Urine	*

\* - For sampling details, please see the source document.

**Recommended monitoring procedures** Not available.

**Derived no-effect level (DNEL)** Not available.

**Predicted no effect concentrations (PNECs)** Not available.

## 8.2. Exposure controls

**Appropriate engineering controls** Not available.

### Individual protection measures, such as personal protective equipment

**Eye/face protection** Not available.

#### Skin protection

- **Hand protection** Not available.

- **Other** Not available.

**Respiratory protection** Not available.

**Thermal hazards** Not available.

**Hygiene measures** Not available.

**Environmental exposure controls** Not available.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

#### Appearance

**Physical state** Solid.

**Form** Not available.

**Colour** Not available.

**Odour** Not applicable.

**Odour threshold** Not available.

**pH** Not available.

**Melting point/freezing point** 231,9 °C (449,42 °F) estimated

**Initial boiling point and boiling range** 907 °C (1664,6 °F) estimated

**Flash point** Not available.



<b>Evaporation rate</b>	Not available.
<b>Flammability (solid, gas)</b>	Not applicable.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	Not available.
<b>Flammability limit - upper (%)</b>	Not available.
<b>Vapour pressure</b>	0,00001 hPa estimated
<b>Vapour density</b>	Not available.
<b>Relative density</b>	Not available.
<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	Not available.
<b>Solubility (other)</b>	Not available.
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	630 °C (1166 °F) estimated
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not available.
<b>Explosive properties</b>	Not available.
<b>Oxidizing properties</b>	Not available.
<b>9.2. Other information</b>	
<b>Density</b>	9,51 g/cm3 estimated
<b>Specific gravity</b>	9,51 estimated

## SECTION 10: Stability and reactivity

<b>10.1. Reactivity</b>	Not available.
<b>10.2. Chemical stability</b>	Not available.
<b>10.3. Possibility of hazardous reactions</b>	Not available.
<b>10.4. Conditions to avoid</b>	Not available.
<b>10.5. Incompatible materials</b>	Not available.
<b>10.6. Hazardous decomposition products</b>	Not available.

## SECTION 11: Toxicological information

<b>General information</b>	Not available.
<b>Information on likely routes of exposure</b>	
<b>Inhalation</b>	Not available.
<b>Skin contact</b>	Not available.
<b>Eye contact</b>	Not available.
<b>Ingestion</b>	Not available.
<b>Symptoms</b>	Not available.

### 11.1. Information on toxicological effects

Components	Species	Test results
Silver (CAS 7440-22-4)		
<b>Acute</b>		
<b>Dermal</b>		
LD50	Rat	> 2000 mg/kg
<b>Oral</b>		
LD50	Rat	> 5000 mg/kg
<b>Skin corrosion/irritation</b>	Not available.	
<b>Serious eye damage/eye irritation</b>	Not available.	
<b>Respiratory sensitisation</b>	Not available.	
<b>Skin sensitisation</b>	Not available.	

**Germ cell mutagenicity** Not available.

**Carcinogenicity**

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Nickel (CAS 7440-02-0) 2B Possibly carcinogenic to humans.

**Reproductive toxicity** Not available.

**Specific target organ toxicity - single exposure** Not available.

**Specific target organ toxicity - repeated exposure** Not available.

**Aspiration hazard** Not available.

**Mixture versus substance information** Not available.

**Other information** Not available.

**SECTION 12: Ecological information**

**12.1. Toxicity**

Components		Species	Test results
Copper (CAS 7440-50-8)			
<b>Aquatic</b>			
Crustacea	EC50	Water flea (Daphnia magna)	0,036 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	0,0319 - 0,0544 mg/l, 96 hours
Nickel (CAS 7440-02-0)			
<b>Aquatic</b>			
Crustacea	EC50	Water flea (Daphnia magna)	1 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	2,923 mg/l, 96 hours
Silver (CAS 7440-22-4)			
<b>Aquatic</b>			
Crustacea	EC50	Water flea (Daphnia magna)	0,0002 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	0,0023 - 0,0033 mg/l, 96 hours

**12.2. Persistence and degradability** Not available.

**12.3. Bioaccumulative potential** Not available.

**Partition coefficient n-octanol/water (log Kow)** Not available.

**Bioconcentration factor (BCF)** Not available.

**12.4. Mobility in soil** Not available.

**12.5. Results of PBT and vPvB assessment** Not a PBT or vPvB substance or mixture.

**12.6. Other adverse effects** Not available.

**SECTION 13: Disposal considerations**

**13.1. Waste treatment methods**

**Residual waste** Not available.

**Contaminated packaging** Not available.

**EU waste code** Not available.

**SECTION 14: Transport information**

**ADR**

**14.1. UN number** UN3077

**14.2. UN proper shipping name** Environmentally hazardous substance, solid, n.o.s.

**14.3. Transport hazard class(es)**

**Class** 9

**Subsidiary risk** -

**Label(s)** 9

**Hazard No. (ADR)** 90  
**Tunnel restriction code** E  
**14.4. Packing group** III  
**14.5. Environmental hazards** Yes  
**14.6. Special precautions for user** Not available.

#### RID

**14.1. UN number** UN3077  
**14.2. UN proper shipping name** Environmentally hazardous substance, solid, n.o.s.  
**14.3. Transport hazard class(es)**  
**Class** 9  
**Subsidiary risk** -  
**Label(s)** 9  
**14.4. Packing group** III  
**14.5. Environmental hazards** Yes  
**14.6. Special precautions for user** Not available.

#### ADN

**14.1. UN number** UN3077  
**14.2. UN proper shipping name** Environmentally Hazardous Solid, N.o.s.  
**14.3. Transport hazard class(es)**  
**Class** 9  
**Subsidiary risk** -  
**Label(s)** 9  
**14.4. Packing group** III  
**14.5. Environmental hazards** Yes  
**14.6. Special precautions for user** Not available.

#### IATA

**14.1. UN number** UN3077  
**14.2. UN proper shipping name** Environmentally hazardous substance, solid, n.o.s.  
**14.3. Transport hazard class(es)**  
**Class** 9  
**Subsidiary risk** -  
**14.4. Packing group** III  
**14.5. Environmental hazards** Yes  
**ERG Code** 9L  
**14.6. Special precautions for user** Not available.

#### Other information

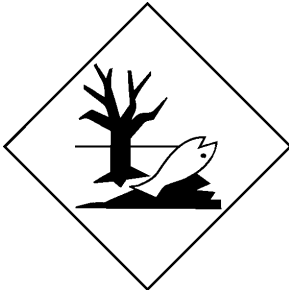
**Passenger and cargo aircraft** Allowed.  
**Cargo aircraft only** Allowed.

#### IMDG

**14.1. UN number** UN3077  
**14.2. UN proper shipping name** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., MARINE POLLUTANT  
**14.3. Transport hazard class(es)**  
**Class** 9  
**Subsidiary risk** -  
**14.4. Packing group** III  
**14.5. Environmental hazards**  
**Marine pollutant** Yes  
**EmS** F-A, S-F  
**14.6. Special precautions for user** Not available.



Marine pollutant



## SECTION 15: Regulatory information

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

#### EU regulations

**Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I, as amended**  
Not listed.

**Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex II, as amended**  
Not listed.

**Regulation (EC) No. 850/2004 on persistent organic pollutants, Annex I**  
Not listed.

**Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1**  
Not listed.

**Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2**  
Not listed.

**Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3**  
Not listed.

**Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V**  
Not listed.

**Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended**  
Not listed.

**Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA**  
Not listed.

#### Authorisations

**Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended**  
Not listed.

**Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended**  
Not listed.

#### Restrictions on use

**Regulation (EC) No. 1907/2006 Annex XVII Substances subject to restriction on marketing and use**  
Nickel (CAS 7440-02-0)  
Zinc (CAS 7440-66-6)

**Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended**  
Not listed.

**Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breastfeeding, as amended**  
Not listed.

## Other EU regulations

### Directive 2012/18/EU on major accident hazards involving dangerous substances

Not listed.

### Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work, as amended

Zinc (CAS 7440-66-6)

### Directive 94/33/EC on the protection of young people at work, as amended

Not listed.

**National regulations** Not available.

**15.2. Chemical safety assessment** Not available.

## SECTION 16: Other information

**List of abbreviations** Not available.

**References** Not available.

**Information on evaluation method leading to the classification of mixture** Not available.

### Full text of any statements or R-phrases and H-statements under Sections 2 to 15

R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

H261 In contact with water releases flammable gases.

H351 Suspected of causing cancer.

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

H412 Harmful to aquatic life with long lasting effects.

**Revision information** None.

**Training information** Not available.