



SAFETY DATA SHEET

MATERION

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

1.1. Product identifier

Name of the substance Silver Core Material/Targets
Identification number 7440-22-4 (CAS number)
Synonyms None.
Document number W31
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

Environmental hazards

Hazardous to the aquatic environment, acute aquatic hazard Category 1 M-factor = 1000. H400 - Very toxic to aquatic life.

Hazardous to the aquatic environment, long-term aquatic hazard Category 1 M-factor = 1000. 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: Silver
Hazard pictograms None.
Signal word Warning
Hazard statements
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention

P273 Avoid release to the environment.

Response

P391 Collect spillage.

Storage

Not available.

Disposal

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

Supplemental label information

None.

2.3. Other hazards

None known.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Silver	99 - 99,9	7440-22-4 231-131-3	-	-	# M=1000
Classification:	DSD: N;R50/53				
	CLP: Aquatic Acute 1;H400, Aquatic Chronic 1;H410				

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.

Ingestion Not available.

4.2. Most important symptoms and effects, both acute and delayed Not available.

4.3. Indication of any immediate medical attention and special treatment needed Not available.

SECTION 5: Firefighting measures

General fire hazards Not available.

5.1. Extinguishing media

Suitable extinguishing media Not available.

Unsuitable extinguishing media Not available.

5.2. Special hazards arising from the substance or mixture Not available.

5.3. Advice for firefighters

Special protective equipment for firefighters Not available.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Not available.

For emergency responders Not available.

6.2. Environmental precautions Not available.

6.3. Methods and material for containment and cleaning up Not available.

6.4. Reference to other sections Not available.

SECTION 7: Handling and storage

7.1. Precautions for safe handling Not available.

7.2. Conditions for safe storage, including any incompatibilities Not available.

7.3. Specific end use(s) 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

Material	Type	Value	Form
Silver Core Material/Targets	MAK	0,1 mg/m ³	Inhalable fraction.
	STEL	0,1 mg/m ³	Inhalable fraction.
Components	Type	Value	Form
Silver (CAS 7440-22-4)	MAK	0,1 mg/m ³	Inhalable fraction.
	STEL	0,1 mg/m ³	Inhalable fraction.

Belgium. Exposure Limit Values.

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³
Components	Type	Value
Silver (CAS 7440-22-4)	TWA	0,1 mg/m ³

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

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³
Components	Type	Value
Silver (CAS 7440-22-4)	TWA	0,1 mg/m ³

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

Material	Type	Value
Silver Core Material/Targets	MAC	0,1 mg/m ³
Components	Type	Value
Silver (CAS 7440-22-4)	MAC	0,1 mg/m ³

Czech Republic. OELs. Government Decree 361

Material	Type	Value
Silver Core Material/Targets	Ceiling	0,3 mg/m ³
	TWA	0,1 mg/m ³
Components	Type	Value
Silver (CAS 7440-22-4)	Ceiling	0,3 mg/m ³
	TWA	0,1 mg/m ³

Denmark. Exposure Limit Values

Material	Type	Value	Form
Silver Core Material/Targets	TLV	0,01 mg/m ³	Dust.
Components	Type	Value	Form
Silver (CAS 7440-22-4)	TLV	0,01 mg/m ³	Dust.

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

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³
Components	Type	Value

Silver (CAS 7440-22-4)	TWA	0,1 mg/m ³
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Finland. Workplace Exposure Limits

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³
Components	Type	Value

Silver (CAS 7440-22-4)	TWA	0,1 mg/m ³
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France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984

Material	Type	Value
Silver Core Material/Targets	VME	0,1 mg/m ³
Components	Type	Value

Silver (CAS 7440-22-4)	VME	0,1 mg/m ³
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Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG)

Material	Type	Value	Form
Silver Core Material/Targets	TWA	0,1 mg/m ³	Inhalable fraction.
Components	Type	Value	Form

Silver (CAS 7440-22-4)	TWA	0,1 mg/m ³	Inhalable fraction.
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Germany. TRGS 900, Limit Values in the Ambient Air at the Workplace

Material	Type	Value	Form
Silver Core Material/Targets	AGW	0,1 mg/m ³	Inhalable fraction.
Components	Type	Value	Form

Silver (CAS 7440-22-4)	AGW	0,1 mg/m ³	Inhalable fraction.
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Greece. OELs (Decree No. 90/1999, as amended)

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³
Components	Type	Value

Silver (CAS 7440-22-4)	TWA	0,1 mg/m ³
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Hungary. OELs. Joint Decree on Chemical Safety of Workplaces

Material	Type	Value
Silver Core Material/Targets	STEL	0,4 mg/m ³
Components	Type	Value

	TWA	0,1 mg/m ³
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Silver (CAS 7440-22-4)	STEL	0,4 mg/m ³
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	TWA	0,1 mg/m ³
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Iceland. OELs. Regulation 154/1999 on occupational exposure limits

Material	Type	Value	Form
Silver Core Material/Targets	TWA	0,01 mg/m ³	Dust.
Components	Type	Value	Form

Silver (CAS 7440-22-4)	TWA	0,01 mg/m ³	Dust.
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Ireland. Occupational Exposure Limits

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³
Components	Type	Value

Silver (CAS 7440-22-4)	TWA	0,1 mg/m ³
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Italy. Occupational Exposure Limits

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

Italy. Occupational Exposure Limits

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

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

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

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

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

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

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

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

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

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

Netherlands. OELs (binding)

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

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

Norway. Administrative Norms for Contaminants in the Workplace

Material	Type	Value	Form
Silver Core Material/Targets	TLV	0,1 mg/m ³	Dust and fume.

Components	Type	Value	Form
Silver (CAS 7440-22-4)	TLV	0,1 mg/m ³	Dust and fume.

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

Material	Type	Value	Form
Silver Core Material/Targets	TWA	0,05 mg/m ³	Inhalable fraction.

Components	Type	Value	Form
Silver (CAS 7440-22-4)	TWA	0,05 mg/m ³	Inhalable fraction.

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

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

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

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

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

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

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

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

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

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

Material	Type	Value
Silver Core Material/Targets	TWA	0,01 mg/m ³

Components	Type	Value
Silver (CAS 7440-22-4)	TWA	0,01 mg/m ³

Spain. Occupational Exposure Limits

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

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

Sweden. Occupational Exposure Limit Values

Material	Type	Value	Form
Silver Core Material/Targets	TWA	0,1 mg/m ³	Total dust.

Components	Type	Value	Form
Silver (CAS 7440-22-4)	TWA	0,1 mg/m ³	Total dust.

Switzerland. SUVA Grenzwerte am Arbeitsplatz

Material	Type	Value	Form
Silver Core Material/Targets	STEL	0,8 mg/m ³	Inhalable dust.

Components	Type	Value	Form
Silver (CAS 7440-22-4)	TWA	0,1 mg/m ³	Inhalable dust.

Silver (CAS 7440-22-4)	STEL	0,8 mg/m ³	Inhalable dust.
	TWA	0,1 mg/m ³	Inhalable dust.

UK. EH40 Workplace Exposure Limits (WELs)

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

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

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

Material	Type	Value
Silver Core Material/Targets	TWA	0,1 mg/m ³

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

Biological limit values No biological exposure limits noted for the ingredient(s).

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	960,5 °C (1760,9 °F)
Initial boiling point and boiling range	2000 °C (3632 °F)
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Vapour pressure	< 0,0000001 kPa at 25 °C
Vapour density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Insoluble
Solubility (other)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Explosive properties	Not available.
Oxidizing properties	Not available.

9.2. Other information

Density	10,49 g/cm ³ estimated at 15 °C
Molecular formula	Ag
Molecular weight	107,86 g/mol
Specific gravity	10,49 at 15 °C

SECTION 10: Stability and reactivity

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

SECTION 11: Toxicological information

General information	Not available.
Information on likely routes of exposure	
Inhalation	Not available.
Skin contact	Not available.
Eye contact	Not available.

Ingestion	Not available.
Symptoms	Not available.

11.1. Information on toxicological effects

Product	Species	Test results
Silver Core Material/Targets		
Acute		
Dermal		
LD50	Rat	> 2000 mg/kg
Oral		
LD50	Rat	> 5000 mg/kg
Components	Species	Test results
Silver (CAS 7440-22-4)		
Acute		
Dermal		
LD50	Rat	> 2000 mg/kg
Oral		
LD50	Rat	> 5000 mg/kg
Skin corrosion/irritation	Not available.	
Serious eye damage/eye irritation	Not available.	
Respiratory sensitisation	Not available.	
Skin sensitisation	Not available.	
Germ cell mutagenicity	Not available.	
Carcinogenicity	Not available.	
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

Product	Species	Test results
Silver Core Material/Targets		
Aquatic		
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
Components	Species	Test results
Silver (CAS 7440-22-4)		
Aquatic		
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

Not regulated as dangerous goods.

RID

Not regulated as dangerous goods.

ADN

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

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

Not regulated.

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

Not listed.

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.

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

Revision information None.

Training information Not available.