



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 Ge-As-Se-In-Si targets
Registration number -
Document number 20C
Synonyms None.
Materion Code 20C
Issue date 08-September-2020
Version number 02
Revision date 12-November-2021

1.3. Details of the supplier of the safety data sheet

Supplier

Company name Materion Advanced Chemicals Inc.
Address 407 N. 13th Street
1316 W. St. Paul Avenue
Milwaukee, WI 53233
United States
Division Milwaukee
Telephone 414.212.0257
e-mail advancedmaterials@materion.com
Contact person Laura Hamilton

1.4. Emergency telephone number

Supersedes date 08-September-2020

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

Identified uses Not available.
Uses advised against None known.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The mixture has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

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

Health hazards

Acute toxicity, oral	Category 4	H302 - Harmful if swallowed.
Acute toxicity, inhalation	Category 3	H331 - Toxic if inhaled.
Carcinogenicity	Category 1A	H350 - May cause cancer.
Specific target organ toxicity - repeated exposure	Category 2	H373 - May cause damage to organs through prolonged or repeated exposure.

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 3	H412 - Harmful to aquatic life with long lasting effects.

Hazard summary Toxic if inhaled. Harmful if swallowed. May cause damage to organs through prolonged or repeated exposure. May cause cancer. Prolonged exposure may cause chronic effects. Dangerous for the environment if discharged into watercourses. Occupational exposure to the substance or mixture may cause adverse health effects. The material as sold in solid form is generally not considered hazardous. However, if the process involves grinding, melting, cutting or any other process that causes a release of dust or fumes, hazardous levels of airborne particulate could be generated.

2.2. Label elements

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

Contains: Arsenic, Germanium, Selenium, Silicon

Hazard pictograms



Signal word

Danger

Hazard statements

H302	Harmful if swallowed.
H331	Toxic if inhaled.
H350	May cause cancer.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H412	Harmful 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.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P261	Avoid breathing dust.
P264	Wash thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.

Response

P301 + P312	IF SWALLOWED: Call a POISON CENTRE or doctor/physician if you feel unwell.
P330	Rinse mouth.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P311	Call a POISON CENTRE or doctor/physician.
P391	Collect spillage.

Storage

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Disposal

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

Supplemental label information

15 % of the mixture consists of component(s) of unknown acute oral toxicity. 100 % of the mixture consists of component(s) of unknown acute dermal toxicity. 35 % of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 35 % of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment. For further information, please contact the Product Stewardship Department at +1.800.862.4118.

2.3. Other hazards

This mixture does not contain substances assessed to be vPvB / PBT according to Regulation (EC) No 1907/2006, Annex XIII.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Arsenic		7440-38-2 231-148-6	-	033-001-00-X	Classification: Acute Tox. 3;H301, Acute Tox. 3;H331, Carc. 1A;H350, Aquatic Acute 1;H400, Aquatic Chronic 1;H410
Germanium		7440-56-4 231-164-3	-	-	Classification: -
Selenium		7782-49-2 231-957-4	-	034-001-00-2	Classification: Acute Tox. 3;H301, Acute Tox. 3;H331, STOT RE 2;H373

Material name: Ge-As-Se-In-Si targets

20C Version #: 02 Revision date: 12-November-2021 Issue date: 08-September-2020

SDS EU
2 / 13

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Silicon		7440-21-3 231-130-8	-	-	

Classification: -

Other components below reportable levels ≤ -15

List of abbreviations and symbols that may be used above

#: This substance has been assigned Union workplace exposure limit(s).

M: M-factor

PBT: persistent, bioaccumulative and toxic substance.

vPvB: very persistent and very bioaccumulative substance.

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition comments The full text for all H-statements is displayed in section 16.

SECTION 4: First aid measures

General information IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Show this safety data sheet to the doctor in attendance.

4.1. Description of first aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a poison center or doctor/physician.

Skin contact Rinse with water.

Eye contact Do not rub eyes.

Ingestion If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.

4.2. Most important symptoms and effects, both acute and delayed Headache. Prolonged exposure may cause chronic effects.

4.3. Indication of any immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

SECTION 5: Firefighting measures

General fire hazards No unusual fire or explosion hazards noted.

5.1. Extinguishing media

Suitable extinguishing media Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture During fire, gases hazardous to health may be formed.

5.3. Advice for firefighters

Special protective equipment for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Special firefighting procedures Move containers from fire area if you can do so without risk.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of dust. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

For emergency responders Keep unnecessary personnel away. Use personal protection recommended in Section 8 of the SDS.

6.2. Environmental precautions	Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so.
6.3. Methods and material for containment and cleaning up	Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Prevent product from entering drains. Stop the flow of material, if this is without risk. Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water. Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers.
6.4. Reference to other sections	For personal protection, see section 8. For waste disposal, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimise dust generation and accumulation. Do not taste or swallow. Avoid breathing dust. Avoid prolonged exposure. When using, do not eat, drink or smoke. Should be handled in closed systems, if possible. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment.
7.2. Conditions for safe storage, including any incompatibilities	Store locked up. Store in tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).
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

Components	Type	Value	Form
Indium (CAS 7440-74-6)	MAK	0,1 mg/m ³	Inhalable fraction.
	STEL	0,2 mg/m ³	Inhalable fraction.
Selenium (CAS 7782-49-2)	MAK	0,1 mg/m ³	Inhalable fraction.
	STEL	0,3 mg/m ³	Inhalable fraction.

Belgium. Exposure Limit Values

Components	Type	Value
Arsenic (CAS 7440-38-2)	TWA	0,1 mg/m ³
Indium (CAS 7440-74-6)	TWA	0,1 mg/m ³
Selenium (CAS 7782-49-2)	TWA	0,2 mg/m ³
Silicon (CAS 7440-21-3)	TWA	10 mg/m ³

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

Components	Type	Value
Arsenic (CAS 7440-38-2)	TWA	0,05 mg/m ³
Selenium (CAS 7782-49-2)	TWA	0,2 mg/m ³

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

Components	Type	Value	Form
Arsenic (CAS 7440-38-2)	MAC	0,1 mg/m ³	
Indium (CAS 7440-74-6)	MAC	0,1 mg/m ³	
	STEL	0,3 mg/m ³	
Selenium (CAS 7782-49-2)	MAC	0,1 mg/m ³	
Silicon (CAS 7440-21-3)	MAC	4 mg/m ³	Respirable dust.
		10 mg/m ³	Total dust.

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

Components	Type	Value
Arsenic (CAS 7440-38-2)	TWA	0,01 mg/m ³
Selenium (CAS 7782-49-2)	TWA	0,2 mg/m ³

Czech Republic. OELs. Government Decree 361

Components	Type	Value
Arsenic (CAS 7440-38-2)	Ceiling	0,4 mg/m ³
	TWA	0,1 mg/m ³
Selenium (CAS 7782-49-2)	Ceiling	0,2 mg/m ³
	TWA	0,1 mg/m ³

Denmark. Exposure Limit Values

Components	Type	Value	Form
Indium (CAS 7440-74-6)	TLV	0,1 mg/m ³	Dust.
Selenium (CAS 7782-49-2)	TLV	5 mg/m ³	
Silicon (CAS 7440-21-3)	TLV	10 mg/m ³	

Estonia. OELs. Occupational Exposure Limits of Hazardous Substances (Regulation No. 105/2001, Annex), as amended

Components	Type	Value	Form
Selenium (CAS 7782-49-2)	TWA	0,1 mg/m ³	
Silicon (CAS 7440-21-3)	TWA	5 mg/m ³	Fine dust, respiratory fraction
		10 mg/m ³	Respirable fraction.

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

Components	Type	Value
Arsenic (CAS 7440-38-2)	TWA	0,03 mg/m ³

Finland. Workplace Exposure Limits

Components	Type	Value
Arsenic (CAS 7440-38-2)	TWA	0,01 mg/m ³
Indium (CAS 7440-74-6)	TWA	0,1 mg/m ³
Selenium (CAS 7782-49-2)	STEL	0,3 mg/m ³
	TWA	0,1 mg/m ³

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

Components	Type	Value
Selenium (CAS 7782-49-2)	VME	5 mg/m ³
Regulatory status: Indicative limit (VL)		
Silicon (CAS 7440-21-3)	VME	10 mg/m ³
Regulatory status: Indicative limit (VL)		

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
Selenium (CAS 7782-49-2)	TWA	0,02 mg/m ³	Inhalable fraction.

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

Components	Type	Value	Form
Germanium (CAS 7440-56-4)	AGW	0,85 mg/m ³	Inhalable fraction.
Indium (CAS 7440-74-6)	AGW	0,0001 mg/m ³	Respirable fraction.
Selenium (CAS 7782-49-2)	AGW	0,05 mg/m ³	Inhalable fraction.

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

Components	Type	Value	Form
Arsenic (CAS 7440-38-2)	TWA	0,1 mg/m ³	

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

Components	Type	Value	Form
Indium (CAS 7440-74-6)	STEL	1 mg/m ³	
	TWA	1 mg/m ³	
Selenium (CAS 7782-49-2)	TWA	0,2 mg/m ³	
Silicon (CAS 7440-21-3)	TWA	5 mg/m ³	Respirable.
		10 mg/m ³	Inhalable

Hungary. OELs. Joint Decree on Chemical Safety of Workplaces

Components	Type	Value	
Arsenic (CAS 7440-38-2)	Ceiling	0,01 mg/m ³	
Selenium (CAS 7782-49-2)	STEL	0,4 mg/m ³	
	TWA	0,1 mg/m ³	

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

Components	Type	Value	Form
Arsenic (CAS 7440-38-2)	TWA	0,01 mg/m ³	
Indium (CAS 7440-74-6)	TWA	0,1 mg/m ³	Dust.
Selenium (CAS 7782-49-2)	TWA	0,1 mg/m ³	
Silicon (CAS 7440-21-3)	TWA	0,7 mg/m ³	
		0,5 ppm	

Ireland. Occupational Exposure Limits

Components	Type	Value	Form
Arsenic (CAS 7440-38-2)	TWA	0,01 mg/m ³	
Indium (CAS 7440-74-6)	STEL	0,3 mg/m ³	
	TWA	0,1 mg/m ³	
Selenium (CAS 7782-49-2)	TWA	0,1 mg/m ³	
Silicon (CAS 7440-21-3)	TWA	4 mg/m ³	Respirable dust.
		10 mg/m ³	Total inhalable dust.

Italy. Occupational Exposure Limits

Components	Type	Value	
Arsenic (CAS 7440-38-2)	TWA	0,01 mg/m ³	
Indium (CAS 7440-74-6)	TWA	0,1 mg/m ³	
Selenium (CAS 7782-49-2)	TWA	0,2 mg/m ³	

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

Components	Type	Value	
Arsenic (CAS 7440-38-2)	STEL	0,04 mg/m ³	
	TWA	0,01 mg/m ³	

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

Components	Type	Value	
Arsenic (CAS 7440-38-2)	TWA	0,03 mg/m ³	
Germanium (CAS 7440-56-4)	TWA	2 mg/m ³	
Indium (CAS 7440-74-6)	TWA	0,1 mg/m ³	
Selenium (CAS 7782-49-2)	TWA	0,1 mg/m ³	

Norway. Administrative Norms for Contaminants in the Workplace

Components	Type	Value	
Arsenic (CAS 7440-38-2)	TLV	0,01 mg/m ³	
Indium (CAS 7440-74-6)	TLV	0,1 mg/m ³	
Selenium (CAS 7782-49-2)	TLV	0,05 mg/m ³	
Silicon (CAS 7440-21-3)	TLV	10 mg/m ³	

Poland. Ordinance of the Minister of Labour and Social Policy on 6 June 2014 on the maximum permissible concentrations and intensities of harmful health factors in the work environment, Journal of Laws 2014, item 817

Components	Type	Value
Arsenic (CAS 7440-38-2)	TWA	0,01 mg/m ³
Selenium (CAS 7782-49-2)	STEL	0,3 mg/m ³
	TWA	0,1 mg/m ³

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

Components	Type	Value
Arsenic (CAS 7440-38-2)	TWA	0,01 mg/m ³
Indium (CAS 7440-74-6)	TWA	0,1 mg/m ³
Selenium (CAS 7782-49-2)	TWA	0,2 mg/m ³

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

Components	Type	Value
Arsenic (CAS 7440-38-2)	STEL	0,1 mg/m ³
	TWA	0,01 mg/m ³
Germanium (CAS 7440-56-4)	STEL	5 mg/m ³
	TWA	2 mg/m ³
Selenium (CAS 7782-49-2)	STEL	0,2 mg/m ³
	TWA	0,1 mg/m ³

Slovakia. OELs for carcinogens and mutagens. Regulation No. 46/2002 on carcinogenic and mutagenic substances

Components	Type	Value	Form
Arsenic (CAS 7440-38-2)	TWA	0,1 mg/m ³	Inhalable fraction.

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

Components	Type	Value	Form
Selenium (CAS 7782-49-2)	TWA	0,1 mg/m ³	
Silicon (CAS 7440-21-3)	TWA	4 mg/m ³	Respirable fraction.
		10 mg/m ³	Inhalable 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
Indium (CAS 7440-74-6)	TWA	0,0001 mg/m ³	Respirable fraction.
Selenium (CAS 7782-49-2)	TWA	0,05 mg/m ³	Inhalable fraction.

Spain. Occupational Exposure Limits

Components	Type	Value
Arsenic (CAS 7440-38-2)	TWA	0,01 mg/m ³
Indium (CAS 7440-74-6)	TWA	0,1 mg/m ³
Selenium (CAS 7782-49-2)	TWA	0,1 mg/m ³

Sweden. OELs. Work Environment Authority (AV), Occupational Exposure Limit Values (AFS 2015:7)

Components	Type	Value	Form
Arsenic (CAS 7440-38-2)	TWA	0,01 mg/m ³	Total dust.
Indium (CAS 7440-74-6)	TWA	0,1 mg/m ³	Total dust.
Selenium (CAS 7782-49-2)	TWA	0,1 mg/m ³	Total dust.

Switzerland. SUVA Grenzwerte am Arbeitsplatz

Components	Type	Value	Form
Indium (CAS 7440-74-6)	TWA	0,1 mg/m ³	Inhalable fraction.
Selenium (CAS 7782-49-2)	STEL	0,16 mg/m ³	Inhalable fraction.
	TWA	0,02 mg/m ³	Inhalable fraction.
Silicon (CAS 7440-21-3)	TWA	3 mg/m ³	Respirable fraction.

UK. EH40 Workplace Exposure Limits (WELs)

Components	Type	Value	Form
Arsenic (CAS 7440-38-2)	TWA	0,1 mg/m ³	
Indium (CAS 7440-74-6)	STEL	0,3 mg/m ³	
		0 ppm	
	TWA	0,1 mg/m ³	
Selenium (CAS 7782-49-2)	TWA	0,1 mg/m ³	
Silicon (CAS 7440-21-3)	TWA	4 mg/m ³	Respirable dust.
		10 mg/m ³	Inhalable dust.

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
Arsenic (CAS 7440-38-2)	0,075 µmol/mmol	Arsenic	Creatinine in urine	*
	0,05 mg/g	Arsenic	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
Arsenic (CAS 7440-38-2)	70 nmol/l	Inorganic arsenic	Urine	*

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

France. Biological indicators of exposure (IBE) (National Institute for Research and Security (INRS, ND 2065)

Components	Value	Determinant	Specimen	Sampling Time
Arsenic (CAS 7440-38-2)	0,05 mg/g	Métabolites de l'arsenic inorganique	Creatinine in 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
Arsenic (CAS 7440-38-2)	0,13 mg/g	Arsenic	Creatinine in urine	*
	0,2 µmol/mmol	Arsenic	Creatinine in urine	*
Selenium (CAS 7782-49-2)	0,075 mg/g	Selenium	Creatinine in urine	*
	0,11 µmol/mmol	Selenium	Creatinine in urine	*

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

Spain. Biological Limit Values (VLBs), Occupational Exposure Limits for Chemical Agents, Table 4

Components	Value	Determinant	Specimen	Sampling Time
Arsenic (CAS 7440-38-2)	35 µg/l	Arsénico inorgánico más metabolitos metilados como As	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
Arsenic (CAS 7440-38-2)	50 µg/l	Anorganisches Arsen und methylierte Metaboliten	Urine	*

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

Recommended monitoring procedures	Follow standard monitoring procedures.
Derived no effect levels (DNELs)	Not available.
Predicted no effect concentrations (PNECs)	Not available.
8.2. Exposure controls	
Appropriate engineering controls	Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.
Individual protection measures, such as personal protective equipment	
General information	Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.
Eye/face protection	If contact is likely, safety glasses with side shields are recommended.
Skin protection	
- Hand protection	Wear appropriate chemical resistant gloves.
- Other	Use of an impervious apron is recommended.
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
Hygiene measures	Observe any medical surveillance requirements. Wash hands after handling and before eating. Keep away from food and drink.
Environmental exposure controls	Inform appropriate managerial or supervisory personnel of all environmental releases. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Solid.
Physical state	Solid.
Form	Solid.
Colour	Not available.
Odour	Not available.
Odour threshold	Not available.
pH	Not available.
Melting point/freezing point	156,6 °C (313,88 °F) estimated
Initial boiling point and boiling range	685 °C (1265 °F) estimated
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Vapour pressure	4676,52 hPa estimated
Vapour density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.

Viscosity	Not available.
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.
9.2. Other information	
Density	5,06 g/cm ³ estimated
Specific gravity	5,06 estimated

SECTION 10: Stability and reactivity

10.1. Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
10.2. Chemical stability	Material is stable under normal conditions.
10.3. Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
10.4. Conditions to avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Avoid temperatures exceeding the decomposition temperature. Contact with incompatible materials.
10.5. Incompatible materials	Acids. Chlorine. Fluorine.
10.6. Hazardous decomposition products	No hazardous decomposition products are known.

SECTION 11: Toxicological information

General information Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

Inhalation	Toxic if inhaled.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	Harmful if swallowed.
Symptoms	Headache.

11.1. Information on toxicological effects

Acute toxicity Toxic if inhaled. Harmful if swallowed.

Product	Species	Test Results
Ge-As-Se-In-Si targets		
<u>Acute</u>		
Oral		
LD50	Rat	408 mg/kg
<u>Components</u>		
<u>Species</u>		
<u>Test Results</u>		
Arsenic (CAS 7440-38-2)		
<u>Acute</u>		
Oral		
LD50	Mouse	145 mg/kg
	Rat	763 mg/kg
Other		
LD50	Mouse	46,2 mg/kg
	Rat	13,39 mg/kg
Germanium (CAS 7440-56-4)		
<u>Acute</u>		
Oral		
LD50	Rat	104 mg/kg
Skin corrosion/irritation	Due to partial or complete lack of data the classification is not possible.	
Serious eye damage/eye irritation	Due to partial or complete lack of data the classification is not possible.	
Respiratory sensitisation	Due to partial or complete lack of data the classification is not possible.	
Skin sensitisation	Due to partial or complete lack of data the classification is not possible.	
Germ cell mutagenicity	Due to partial or complete lack of data the classification is not possible.	
Carcinogenicity	May cause cancer.	

Hungary. 26/2000 EüM Ordinance on protection against and preventing risk relating to exposure to carcinogens at work (as amended)

Not listed.

IARC Monographs. Overall Evaluation of Carcinogenicity

Arsenic (CAS 7440-38-2)

1 Carcinogenic to humans.

Selenium (CAS 7782-49-2)

3 Not classifiable as to carcinogenicity to humans.

Reproductive toxicity	Due to partial or complete lack of data the classification is not possible.
Specific target organ toxicity - single exposure	Due to partial or complete lack of data the classification is not possible.
Specific target organ toxicity - repeated exposure	May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard	Due to partial or complete lack of data the classification is not possible.
Mixture versus substance information	No information available.
Other information	Not available.

SECTION 12: Ecological information

12.1. Toxicity Very toxic to aquatic life. Harmful to aquatic life with long lasting effects.

Product		Species	Test Results
Ge-As-Se-In-Si targets			
Aquatic			
Fish	LC50	Fish	24,75 mg/l, 96 hours
Acute			
Fish	LC50	Fish	24,75 mg/l, 96 hours estimated
Components		Species	Test Results

Arsenic (CAS 7440-38-2)

Aquatic

Acute

Fish

LC50

Fathead minnow (*Pimephales promelas*)

9,9 mg/l, 96 hours

12.2. Persistence and degradability No data is available on the degradability of any ingredients in the mixture.

12.3. Bioaccumulative potential No data available.

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

Bioconcentration factor (BCF) Not available.

12.4. Mobility in soil No data available.

12.5. Results of PBT and vPvB assessment This mixture does not contain substances assessed to be vPvB / PBT according to Regulation (EC) No 1907/2006, Annex XIII.

12.6. Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

12.7. Additional information

Estonia Dangerous substances in soil Data

Arsenic (CAS 7440-38-2)

ARSENIC (AS) 20 mg/kg

ARSENIC (AS) 30 mg/kg

ARSENIC (AS) 50 mg/kg

Selenium (CAS 7782-49-2)

Selenium (Se) 1 mg/kg

Selenium (Se) 20 mg/kg

Selenium (Se) 5 mg/kg

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

EU waste code	The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Disposal methods/information	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Special precautions	Dispose in accordance with all applicable regulations.

SECTION 14: Transport information

ADR

14.1. - 14.6.: Not regulated as dangerous goods.

RID

14.1. - 14.6.: Not regulated as dangerous goods.

ADN

14.1. - 14.6.: Not regulated as dangerous goods.

IATA

14.1. - 14.6.: Not regulated as dangerous goods.

IMDG

14.1. - 14.6.: 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 and II, as amended
Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended
Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended
Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended
Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended
Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended
Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended
Arsenic (CAS 7440-38-2)

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.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Arsenic (CAS 7440-38-2)

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.

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended

Arsenic (CAS 7440-38-2)

Selenium (CAS 7782-49-2)

Other regulations

The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.

National regulations	According to Directive 92/85/EEC as amended, pregnant women should not work with the product, if there is the least risk of exposure.
	Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended. Follow national regulation on the protection of workers from the risks of exposure to carcinogens and mutagens at work, in accordance with Directive 2004/37/EC, as amended.
15.2. Chemical safety assessment	No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
 ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
 AGW: Occupational threshold limit value (Arbeitsplatzgrenzwert – Germany).
 CAS: Chemical Abstract Service.
 CEN: European Committee for Standardization.
 IATA: International Air Transport Association.
 IBC: Intermediate Bulk Container.
 IMDG: International Maritime Dangerous Goods.
 MAC: Maximum Allowed Concentration.
 MARPOL: International Convention for the Prevention of Pollution from Ships.
 PBT: Persistent, bioaccumulative, toxic.
 RID: Regulations concerning the International Carriage of Dangerous Goods by Rail.
 STEL: Short term exposure limit.
 TLV: Threshold Limit Value.
 TWA: Time Weighted Average.
 VLE: Exposure Limit Value.
 VME: Exposure Average Value.
 vPvB: Very persistent and very bioaccumulative.
 Not available.

References

Information on evaluation method leading to the classification of mixture

The classification for health and environmental hazards is derived by a combination of calculator methods and test data, if available. Not applicable.

Training information

Follow training instructions when handling this material.

Disclaimer

Materion Advanced Chemicals Inc. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. This document has been prepared using data from sources considered to be technically reliable and the information is believed to be correct. Materion makes no warranties, expressed or implied, as to the accuracy of the information contained herein. Materion cannot anticipate all conditions under which this information and its products may be used and the actual conditions of use are beyond its control. The user is responsible to evaluate all available information when using this product for any particular use and to comply with all Federal, State, Provincial and Local laws, statutes and regulations.