



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-Si 13-28-55-4 at% (13-28-58-2 wt%) |
| Registration number | - |
| Document number | 2JZ |
| Synonyms | None. |
| Materion Code | 2JZ |
| Issue date | 12-March-2019 |
| Version number | 01 |

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 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 | Noreen Atkinson |

1.4. Emergency telephone number

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 3 | H301 - Toxic 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 1 | H410 - Very toxic to aquatic life with long lasting effects. |

Hazard summary

Toxic if inhaled. Toxic 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 |
|------------------|------------------------------|

Hazard pictograms



Signal word

Danger

Hazard statements

| | |
|------|--|
| H301 | Toxic 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. |
| 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. |
| 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. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |

Response

| | |
|-------------|--|
| P301 + P310 | IF SWALLOWED: Immediately call a POISON CENTRE/doctor. |
| P330 | Rinse mouth. |
| P304 + P340 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. |
| P311 | Call a POISON CENTRE/doctor. |
| 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

14,1 % 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. 14,1 % of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 14,1 % 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

Not a PBT or vPvB substance or mixture.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

General information

| Chemical name | % | CAS-No. / EC No. | REACH Registration No. | Index No. | Notes |
|--|---|------------------------|------------------------|--------------|-------|
| Selenium | 57,9 | 7782-49-2 231-957-4 | - | 034-001-00-2 | |
| Classification: | Acute Tox. 3;H301, Acute Tox. 3;H331, STOT RE 2;H373 | | | | |
| Arsenic | 28 | 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 | 12,6 | 7440-56-4 231-164-3 | - | - | |
| Classification: | - | | | | |
| Other components below reportable levels | 1 - < 60 | | | | |

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). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. 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 CENTRE or doctor/physician.

Skin contact Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact Do not rub eyes. Rinse with water. Get medical attention if irritation develops and persists.

Ingestion Call a physician or poison control centre immediately. Rinse mouth. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

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 Foam. Powder. Dry sand. Carbon dioxide (CO₂).

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 emergency responders Keep unnecessary personnel away.

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. Avoid discharge into drains, water courses or onto the ground.

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 entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk.

Large Spills: Wet down with water and dike for later disposal. Absorb in vermiculite, dry sand or earth and place into containers. 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. Wipe up with absorbent material (e.g. cloth, fleece). 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

Not available.

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. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

Store locked up. Store in original tightly closed container. Store in a well-ventilated place.

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 |
|--------------------------|------|-----------------------|---------------------|
| 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 | 0,01 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 | |
| Selenium (CAS 7782-49-2) | MAC | 0,1 mg/m ³ | |
| Silicon (CAS 7440-21-3) | STEL | 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

| Components | Type | Value |
|-------------------------|------|----------------------|
| Silicon (CAS 7440-21-3) | TLV | 10 mg/m ³ |

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

| Components | Type | Value | Form |
|--------------------------|------|------------------------|------------------|
| Arsenic (CAS 7440-38-2) | TWA | 0,03 mg/m ³ | |
| Selenium (CAS 7782-49-2) | TWA | 0,1 mg/m ³ | |
| Silicon (CAS 7440-21-3) | TWA | 5 mg/m ³ | Respirable dust. |
| | | 10 mg/m ³ | |

Finland. Workplace Exposure Limits Components

| 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 |

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

| Components | Type | Value |
|-------------------------|------|----------------------|
| 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

| Components | Type | Value | Form |
|--------------------------|------|------------------------|---------------------|
| Selenium (CAS 7782-49-2) | AGW | 0,05 mg/m ³ | Inhalable fraction. |

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

| Components | Type | Value | Form |
|--------------------------|------|-----------------------|-------------|
| Arsenic (CAS 7440-38-2) | TWA | 0,1 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

| 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

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

| 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 |

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 |
| Selenium (CAS 7782-49-2) | TWA | 0,1 mg/m ³ |

Netherlands. OELs (binding)

| Components | Type | Value |
|-------------------------|------|--------------------------|
| Arsenic (CAS 7440-38-2) | TWA | 0,0028 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 |
| Selenium (CAS 7782-49-2) | TLV | 0,05 mg/m ³ |
| Silicon (CAS 7440-21-3) | TLV | 10 mg/m ³ |

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 |
| 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. 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 |
|--------------------------|------|-----------------------|---------------------|
| Selenium (CAS 7782-49-2) | TWA | 0,1 mg/m ³ | Inhalable fraction. |

Spain. Occupational Exposure Limits

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

Switzerland. SUVA Grenzwerte am Arbeitsplatz

| Components | Type | Value | Form |
|--------------------------|------|------------------------|----------------------|
| 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 | |
| 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

Croatia. BLV. Dangerous Substance Exposure Limit Values at Workplace, Annexes 4 (as amended)

| Components | Value | Determinant | Specimen | Sampling Time |
|-------------------------|-------------|-------------|----------|---------------|
| Arsenic (CAS 7440-38-2) | 70 µg/l | Arsenic | Urine | * |
| | 0,93 µmol/l | Arsenic | Urine | * |

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

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 | * |

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 |
|--------------------------|----------------|-------------|---------------------|---------------|
| | 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 (typically 10 air changes per hour) 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 Wear suitable protective clothing. 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. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Environmental exposure controls Inform appropriate managerial or supervisory personnel of all environmental releases.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

Physical state Solid.

Form Solid.

| | |
|---|----------------------------------|
| Colour | Not available. |
| Odour | Not available. |
| Odour threshold | Not available. |
| pH | Not available. |
| Melting point/freezing point | 180 °C (356 °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 | 4255,64 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 | 4,92 g/cm ³ estimated |
| Specific gravity | 4,93 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 | Contact with incompatible materials. |
| 10.5. Incompatible materials | Acids. Strong oxidising agents. Fluorine. Chlorine. |
| 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 | Toxic if swallowed. |

Symptoms Headache.

11.1. Information on toxicological effects

| | |
|--|---|
| Acute toxicity | Toxic if inhaled. Toxic if swallowed. |
| 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 with long lasting effects.

| Product | Species | Test Results |
|---|---------|---|
| Ge-As-Se-Si 13-28-55-4 at% (13-28-58-2 wt%) | | |
| Aquatic | | |
| Fish | LC50 | Fish 35,3571 mg/l, 96 hours estimated |
| Components | Species | Test Results |
| Arsenic (CAS 7440-38-2) | | |
| Aquatic | | |
| Fish | LC50 | Fathead minnow (Pimephales promelas) 9,9 mg/l, 96 hours |

* Estimates for product may be based on additional component data not shown.

12.2. Persistence and degradability

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 Not a PBT or vPvB substance or mixture.

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 groundwater Data

Arsenic (CAS 7440-38-2)

ARSENIC (AS) 100 ug/l

ARSENIC (AS) 5 ug/l

Selenium (CAS 7782-49-2)

Selenium (Se) 5 ug/l

Selenium (Se) 50 ug/l

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. 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 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. |

IATA

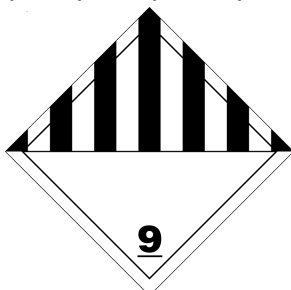
| | |
|---|--|
| 14.1. UN number | UN3077 |
| 14.2. UN proper shipping name | Environmentally hazardous substance, solid, n.o.s. |
| 14.3. Transport hazard class(es) | |
| Class | 9 |
| Subsidiary risk | - |
| 14.4. Packing group | III |

| | |
|---|----------------------------|
| 14.5. Environmental hazards | Yes |
| ERG Code | 9L |
| 14.6. Special precautions for user | Not available. |
| Other information | |
| Passenger and cargo aircraft | Allowed with restrictions. |
| Cargo aircraft only | Allowed with restrictions. |

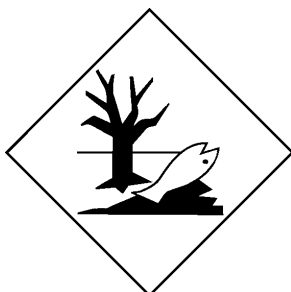
IMDG

| | |
|---|--|
| 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. |

ADN; ADR; IATA; IMDG; RID



Marine pollutant



General information IMDG Regulated 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 and II, as amended

Not listed.

Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I 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

Follow national regulation for work with chemical agents. 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.

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

Not available.

References

Not available.

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.

Training information

Follow training instructions when handling this material.

Disclaimer

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