



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 Cu-In-Ga-Se powder

Registration number -

Synonyms None.

Issue date 16-October-2013

Revision date 14-July-2015

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 26-May-2015

Version number 04

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 product has been assessed and/or tested for its physical, health and environmental hazards following the regulations ABN1 NBR 14725-4: (Safety data sheet for chemicals (SDS)) (Aug. 26, 2009) The mixture has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies. According to GHS criteria.

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

Health hazards

Acute toxicity, oral Category 3
Acute toxicity, inhalation Category 3
Skin corrosion/irritation Category 1C

H314 - Causes severe skin burns and eye damage.

Serious eye damage/eye irritation Category 1
Specific target organ toxicity - repeated exposure Category 2

H318 - Causes serious eye damage.

Environmental hazards

Hazardous to the aquatic environment, acute aquatic hazard Category 1
Hazardous to the aquatic environment, long-term aquatic hazard Category 1

H400 - Very toxic to aquatic life.

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

Hazard summary

DANGER

CAUTION

TOXIC. Toxic if inhaled. Toxic by inhalation and if swallowed. Corrosive. Causes skin and eye burns. Causes serious eye damage. Harmful if swallowed. Harmful if absorbed through skin. May cause irritation to the respiratory system. Possible reproductive hazard. Causes damage to organs. Danger of cumulative effects. Prolonged exposure may cause chronic effects. Dangerous for the environment if discharged into watercourses. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

2.2. Label elements

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

Contains:

Gallium, Selenium

Hazard pictograms



Signal word

Danger

Hazard statements

H301 + H331	Toxic if swallowed or if inhaled
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.
H361	Suspected of damaging fertility or the unborn child.
H370	Causes damage to organs ().
H372	Causes damage to organs (respiratory system) through prolonged or repeated exposure
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.

Precautionary statements

Prevention

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P280	Wear eye/face protection.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P261	Avoid breathing dust/fume.
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.
P301 + P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P311	Call a POISON CENTRE/doctor.
P321	Specific treatment (see this label).
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P363	Wash contaminated clothing before reuse.
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.
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Supplemental label information

62,3 % of the mixture consists of component(s) of unknown acute oral toxicity. 31,69 % of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 31,69 % of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment. % of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

2.3. Other hazards

The Safety Information Sheet Chemicals of hazardous chemical can be obtained through phone, email or on the company website.

SECTION 3: Composition/information on ingredients**3.2. Mixtures****General information**

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Selenium	12 - 57	7782-49-2 231-957-4	-	034-001-00-2	
Classification:	Acute Tox. 3;H301, Acute Tox. 3;H331, STOT RE 2;H373				
Gallium	4 - 24	7440-55-3 231-163-8	-	-	
Classification:	Skin Corr. 1C;H314, Eye Dam. 1;H318				
Other components below reportable levels	19 - 64				

List of abbreviations and symbols that may be used above

CLP: Regulation No. 1272/2008.

DSD: Directive 67/548/EEC.

M: M-factor

vPvB: very persistent and very bioaccumulative substance.

PBT: persistent, bioaccumulative and toxic substance.

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

Composition comments

The full text for all R- and H-phrases is displayed in section 16.

SECTION 4: First aid measures**General information**

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Immediate medical attention is required. In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). 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. In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Wash contaminated clothing before reuse.

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 physician or poison control centre immediately.

Skin contact

Before washing use a dry brush to remove dust from skin. Remove contaminated clothing. Remove and isolate contaminated clothing and shoes. Immediately flush skin with plenty of water. Wash off with soap and plenty of water. Call a physician or poison control centre immediately. For minor skin contact, avoid spreading material on unaffected skin. Wash clothing separately before reuse.

Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes. Rinse cautiously with water for several minutes. Flush eyes with water as a precaution. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately. Call a physician or poison control centre immediately.

Ingestion

IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician. If swallowed, seek medical advice immediately and show this container or label. Call a physician or poison control centre immediately. Rinse mouth. Rinse mouth thoroughly. Never give anything by mouth to a victim who is unconscious or is having convulsions. 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. If ingestion of a large amount does occur, call a poison control centre immediately.

4.2. Most important symptoms and effects, both acute and delayed

Irritation of eyes and mucous membranes. May cause temporary blindness and severe eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Discomfort in the chest. Shortness of breath. Narcosis. Decrease in motor functions. Behavioural changes. Coughing. Liver enlargement. Jaundice. 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. Treat symptomatically. In case of shortness of breath, give oxygen. 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 Powder. Foam. Dry sand. Carbon dioxide (CO₂).

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

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

5.3. Advice for firefighters

Special protective equipment for firefighters Wear suitable protective equipment.

Special firefighting procedures Water runoff can cause environmental damage.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Local authorities should be advised if significant spillages cannot be contained. Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate personal protective equipment. Fully encapsulating, vapour protective clothing should be worn for spills and leaks with no fire. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them.

For emergency responders Keep unnecessary personnel away.

6.2. Environmental precautions Avoid release to the environment. Refer to special instructions/safety data sheets. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

6.3. Methods and material for containment and cleaning up This material is classified as a water pollutant under the Clean Water Act and should be prevented from contaminating soil or from entering sewage and drainage systems which lead to waterways. Stop the flow of material, if this is without risk. Collect spillage. Prevent entry into waterways, sewer, basements or confined areas.

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 breathe dust. Do not get this material in contact with eyes. Do not get this material in contact with skin. Do not taste or swallow. Avoid contact during pregnancy/while nursing. Avoid prolonged exposure. Do not get this material on clothing. Use only outdoors or in a well-ventilated area. Wear personal protective equipment. When using, do not eat, drink or smoke. Wash thoroughly after handling. Handle and open container with care. Use appropriate container to avoid environmental contamination. Avoid release to the environment. Do not empty into drains.

7.2. Conditions for safe storage, including any incompatibilities CAUTION
Keep locked up. Store locked up. Store in a closed container away from incompatible materials. Use appropriate container to avoid environmental contamination. Store in a cool, dry place out of direct sunlight. Store in a well-ventilated place. Keep away from food, drink and animal feeding stuffs. Keep out of the reach of children.

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
Indium (CAS 7440-74-6)	TWA	0,1 mg/m ³
Selenium (CAS 7782-49-2)	TWA	0,2 mg/m ³

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

Components	Type	Value
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
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

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

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

Czech Republic. OELs. Government Decree 361

Components	Type	Value
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.

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

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

Finland. Workplace Exposure Limits

Components	Type	Value
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

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
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
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

Hungary. OELs. Joint Decree on Chemical Safety of Workplaces

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

Ireland. Occupational Exposure Limits

Components	Type	Value
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

Italy. Occupational Exposure Limits

Components	Type	Value
Indium (CAS 7440-74-6)	TWA	0,1 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
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
Indium (CAS 7440-74-6)	TLV	0,1 mg/m ³
Selenium (CAS 7782-49-2)	TLV	0,05 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
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
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
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
Selenium (CAS 7782-49-2)	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)

Components	Type	Value	Form
Indium (CAS 7440-74-6)	TWA	0,1 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
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
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.

UK. EH40 Workplace Exposure Limits (WELs)

Components	Type	Value
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

Biological limit values

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
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.

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 Ensure adequate ventilation, especially in confined areas. Provide eyewash station.

Individual protection measures, such as personal protective equipment

General information Structural firefighters protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations. Eye wash fountain is recommended.

Eye/face protection Do not get in eyes. Chemical goggles are recommended. Face-shield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area. Eye wash fountain is recommended.

Skin protection

- Hand protection Wear protective gloves. Not normally needed.

- Other Do not get this material in contact with skin. Do not get this material on clothing. Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Chemical resistant gloves. Wear chemical protective equipment that is specifically recommended by the manufacturer. It may provide little or no thermal protection. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Structural firefighters protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations.

Respiratory protection Do not breathe dust/fume/gas/mist/vapours/spray. Wear positive pressure self-contained breathing apparatus (SCBA).

Thermal hazards Not available.

Hygiene measures When using, do not eat, drink or smoke. Do not get in eyes. Do not get this material in contact with skin. Do not get this material on clothing. Wash hands before breaks and immediately after handling the product.

Environmental exposure controls Contain spills and prevent releases and observe national regulations on emissions. Environmental manager must be informed of all major 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 29,78 °C (85,6 °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 0,0005 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 available.

Oxidising properties Not available.

9.2. Other information

Density 6,63 g/cm³ estimated

Specific gravity 6,63 estimated

SECTION 10: Stability and reactivity

10.1. Reactivity Not available.

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. Hazardous polymerisation does not occur.

10.4. Conditions to avoid None under normal conditions.

- 10.5. Incompatible materials** Strong oxidising agents. Acids.
- 10.6. Hazardous decomposition products** Irritating and/or toxic fumes and gases may be emitted upon the product's decomposition.

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 by inhalation.
 - Skin contact** Causes skin irritation. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.
 - Eye contact** Causes serious eye damage.
 - Ingestion** Toxic if swallowed.
- Symptoms** Permanent eye damage including blindness could result. Discomfort in the chest. Shortness of breath. Narcosis. Coughing. Liver enlargement. Jaundice. Behavioural changes. Decrease in motor functions. Irritant effects.

11.1. Information on toxicological effects

- Acute toxicity** Toxic by inhalation. Toxic if swallowed. Causes burns. May cause respiratory irritation.
- Skin corrosion/irritation** Hazardous by OSHA criteria. Causes skin irritation.
- Serious eye damage/eye irritation** Causes serious eye damage.
- Respiratory sensitisation** Due to lack of data the classification is not possible.
- Skin sensitisation** Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. Due to lack of data the classification is not possible.
- Germ cell mutagenicity** Due to lack of data the classification is not possible.
- Carcinogenicity** This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

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

Selenium (CAS 7782-49-2) 3 Not classifiable as to carcinogenicity to humans.

- Reproductive toxicity** Suspected of damaging fertility or the unborn child.
- Specific target organ toxicity - single exposure** Respiratory tract irritation. Causes damage to organs ().
- Specific target organ toxicity - repeated exposure** Causes damage to organs () through prolonged or repeated exposure. May cause damage to organs through prolonged or repeated exposure.
- Aspiration hazard** Due to lack of data the classification is not possible.
- Mixture versus substance information** Not available.
- Other information** Symptoms may be delayed.

SECTION 12: Ecological information

- 12.1. Toxicity** Very toxic to aquatic life with long lasting effects. Accumulation in aquatic organisms is expected.

Product	Species	Test Results
Cu-In-Ga-Se powder		
Aquatic		
Crustacea	EC50 Daphnia	0,5227 mg/l, 48 hours estimated
Fish	LC50 Fish	8,259 mg/l, 96 hours estimated

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

- 12.2. Persistence and degradability** No data is available on the degradability of this product.
- 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.

12.7. Additional information

Estonia Dangerous substances in groundwater Data

Selenium (CAS 7782-49-2) Selenium (Se) 5 ug/l
Selenium (Se) 50 ug/l

Estonia Dangerous substances in soil Data

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). Avoid discharge into water courses or onto the ground. Not applicable.

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

EU waste code The Waste code should be assigned in discussion between the user, the producer and the waste disposal company. Waste codes should be assigned by the user based on the application for which the product was used.

Disposal methods/information Contract with a disposal operator licensed by the Law on Disposal and Cleaning. This material and its container must be disposed of as hazardous waste. Incinerate the material under controlled conditions in an approved incinerator. Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities. Do not discharge into drains, water courses or onto the ground. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. After recovery of solvent dispose of residue as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations. Dispose of contents/container (in accordance with related regulations). Collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste.

SECTION 14: Transport information

ADR

14.1. UN number UN3288
14.2. UN proper shipping name Toxic solid, inorganic, n.o.s. (Selenium)
14.3. Transport hazard class(es)
Class 6.1(PGIII)
Subsidiary risk -
Label(s) 6.1
Hazard No. (ADR) 60
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 UN3288
14.2. UN proper shipping name Toxic solid, inorganic, n.o.s. (Selenium)
14.3. Transport hazard class(es)
Class 6.1(PGIII)
Subsidiary risk -
Label(s) 6.1
14.4. Packing group III
14.5. Environmental hazards Yes
14.6. Special precautions for user Not available.

ADN

14.1. UN number	UN3288
14.2. UN proper shipping name	Toxic Solid, N.o.s. (Selenium)
14.3. Transport hazard class(es)	
Class	6.1(PGIII)
Subsidiary risk	-
Label(s)	6.1
14.4. Packing group	III
14.5. Environmental hazards	Yes
14.6. Special precautions for user	Not available.

IATA

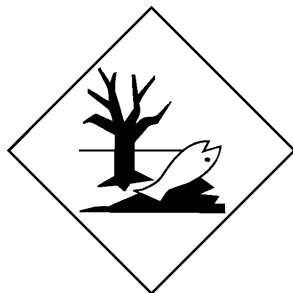
14.1. UN number	UN3288
14.2. UN proper shipping name	Toxic solid, inorganic, n.o.s. (Selenium)
14.3. Transport hazard class(es)	
Class	6.1(PGIII)
Subsidiary risk	-
14.4. Packing group	III
14.5. Environmental hazards	Yes
ERG Code	6L
14.6. Special precautions for user	Not available.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

IMDG

14.1. UN number	UN3288
14.2. UN proper shipping name	TOXIC SOLID, INORGANIC, N.O.S. (Selenium), MARINE POLLUTANT
14.3. Transport hazard class(es)	
Class	6.1(PGIII)
Subsidiary risk	-
14.4. Packing group	III
14.5. Environmental hazards	
Marine pollutant	Yes
EmS	F-A, S-A
14.6. Special precautions for user	Not available.

ADN; ADR; IATA; IMDG; RID

Marine pollutant



General information

DOT Regulated Marine Pollutant. 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

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.

Restrictions on use

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

Not listed.

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

Selenium (CAS 7782-49-2)

Other regulations

The product is classified and labelled in accordance with EC directives or respective national laws. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006. 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.

National regulations

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.

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

Not available.

References

ACGIH
EPA: AQUIRE database
NLM: Hazardous Substances Data Base
US. IARC Monographs on Occupational Exposures to Chemical Agents
Korea. Accidental Release Prevention Substances (Presidential Decree of Toxic Chemical Control Law, Executive Order No. 19203)
Korea. Dangerous Substances Threshold Quantity (Presidential Decree of Dangerous Substances Safety Management Act No. 18406, Schedule 1)
Korea. Harmful Substances Prohibited from Manufacturing (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 29)
Korea. Harmful Substances Requiring Permission for Manufacture or Use (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 30)
Korea. OELs. Regulation for Permitted Concentration of Hazardous Substances (Ministry of Labor (MOL) Public Notice No. 1986-45, as amended)
Korea. Prohibited Chemical Substances (TCCL Article 11)
Korea. Regulated volatile organic compounds (VOCs) (MOE Notice No. 2001-36, March 8, 2001, as amended)
Korea. Restricted Chemical Substances (TCCL Article 11)
Korea. Toxic Chemical Control Law (TCCL), Existing Chemicals Inventory (KECI)
Korea. Toxic Chemical Control Law (TCCL), pre-1997 List
Korea. Toxic Chemicals (TCCL Article 10)
Korea. Toxic Release Inventory (TRI) Chemicals (TCCL Article 14)
Taiwan. Dangerous Materials (Rules on Hazard Communication of Dangerous Materials and Toxic Materials)
Taiwan. Industrial Precursor Chemicals (Categories and Regulations Governing Inspection and Declaration of Industrial Precursor Chemicals, MOEA Decree No. 87, as amended)
Taiwan. OELs. (Standards on Workplace Atmosphere of Dangerous and Hazardous Materials)
Taiwan. Toxic Chemical Substances (TCS) (List of Toxic Chemical Substances announced by the Environmental Protection Administration)
Taiwan. Toxic Materials (Rules on Hazard Communication of Dangerous Materials and Toxic Materials)
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
National Toxicology Program (NTP) Report on Carcinogens
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits
GOST 30333-2007 - Chemical production safety passport. General requirements
JJIS Z 7250: 2010 Safety data sheet for chemical products-Content and order of sections
JIS Z 7251: 2010 Labeling of chemicals based on GHS

Training information

Not available.

Disclaimer

Additional information is given in the Material Safety Data Sheet.

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