

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

| | |
|------------------------------|--|
| Name of the substance | Chromium silicide (CrSi ₂) |
| Identification number | 234-633-0 (EC number) |
| Synonyms | Chromium silicide (CrSi ₂) * Chromium disilicide * CHROMIUM SILICIDE |
| Document number | 1IC |
| Materion Code | 1IC |
| Issue date | 17-May-2015 |
| Version number | 04 |
| Revision date | 10-January-2018 |
| Supersedes date | 18-May-2016 |

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 substance 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

This substance does not meet the criteria for classification according to Regulation (EC) 1272/2008 as amended.

| | |
|-----------------------|--|
| Hazard summary | Not classified for health hazards. However, occupational exposure to the mixture or substance(s) 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: | Chromium silicide |
| Hazard pictograms | None. |
| Signal word | None. |
| Hazard statements | The substance does not meet the criteria for classification. |

Precautionary statements

| | |
|-------------------|--|
| Prevention | Observe good industrial hygiene practices. |
| Response | Wash hands after handling. |
| Storage | Store away from incompatible materials. |
| Disposal | Dispose of waste and residues in accordance with local authority requirements. |

| | |
|---------------------------------------|--|
| Supplemental label information | For further information, please contact the Product Stewardship Department at +1.800.862.4118. |
|---------------------------------------|--|

2.3. Other hazards None known.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

| Chemical name | % | CAS-No. / EC No. | REACH Registration No. | INDEX No. | Notes |
|-------------------|----------|-------------------------|------------------------|-----------|-------|
| Chromium silicide | 90 - 100 | 12018-09-6 234-633-0 | - | - | # |
| Classification: | - | | | | |

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).

SECTION 4: First aid measures

General information

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

4.1. Description of first aid measures

Inhalation

Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact

Get medical attention if irritation develops and persists.

Eye contact

Rinse with water. Get medical attention if irritation develops and persists.

Ingestion

Get medical advice/attention if you feel unwell.

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

Direct contact with eyes may cause temporary irritation.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

General fire hazards

No unusual fire or explosion hazards noted.

5.1. Extinguishing media

Suitable extinguishing media

Water fog. Foam. Dry chemical powder. Carbon dioxide (CO₂).

Unsuitable extinguishing media

None known.

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

Wear suitable protective equipment.

Special firefighting procedures

Use water spray to cool unopened containers.

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. 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

No special environmental precautions required.

6.3. Methods and material for containment and cleaning up

Stop the flow of material, if this is without risk. Following product recovery, flush area with water.

6.4. Reference to other sections

For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid prolonged exposure.

7.2. Conditions for safe storage, including any incompatibilities

Store in original tightly closed container. 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

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | MAK | 2 mg/m3 |

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

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 mg/m3 |

Czech Republic. OELs. Government Decree 361

| Material | Type | Value |
|------------------------------------|---------|-----------|
| Chromium silicide (CAS 12018-09-6) | Ceiling | 1,5 mg/m3 |
| | TWA | 0,5 mg/m3 |

Denmark. Exposure Limit Values

| Material | Type | Value |
|------------------------------------|------|-----------|
| Chromium silicide (CAS 12018-09-6) | TLV | 0,5 mg/m3 |

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

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 mg/m3 |

Finland. Workplace Exposure Limits

| Material | Type | Value |
|------------------------------------|------|-----------|
| Chromium silicide (CAS 12018-09-6) | TWA | 0,5 mg/m3 |

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

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | VME | 2 mg/m3 |

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

| Material | Type | Value | Form |
|------------------------------------|------|---------|---------------------|
| Chromium silicide (CAS 12018-09-6) | AGW | 2 mg/m3 | Inhalable fraction. |

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

| Material | Type | Value |
|------------------------------------|------|-----------|
| Chromium silicide (CAS 12018-09-6) | TWA | 0,5 mg/m3 |

Hungary. OELs. Joint Decree on Chemical Safety of Workplaces

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | STEL | 2 mg/m3 |

Ireland. Occupational Exposure Limits

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 mg/m3 |

Italy. Occupational Exposure Limits

| Material | Type | Value |
|------------------------------------|------|-----------|
| Chromium silicide (CAS 12018-09-6) | TWA | 0,5 mg/m3 |

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

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 mg/m3 |

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

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 mg/m3 |

Luxembourg. Binding Occupational exposure limit values (Annex I), Memorial A

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 mg/m3 |

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

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 mg/m3 |

Norway. Administrative Norms for Contaminants in the Workplace

| Material | Type | Value |
|------------------------------------|------|-----------|
| Chromium silicide (CAS 12018-09-6) | TLV | 0,5 mg/m3 |

Poland. MACs. Regulation regarding maximum permissible concentrations and intensities of harmful factors in the work environment, Annex 1

| Material | Type | Value |
|------------------------------------|------|-----------|
| Chromium silicide (CAS 12018-09-6) | TWA | 0,5 mg/m3 |

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

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 mg/m3 |

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

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 mg/m3 |

Spain. Occupational Exposure Limits

| Material | Type | Value |
|------------------------------------|------|---------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 mg/m3 |

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

| Material | Type | Value | Form |
|------------------------------------|------|-----------|-------------|
| Chromium silicide (CAS 12018-09-6) | TWA | 0,5 mg/m3 | Total dust. |

UK. EH40 Workplace Exposure Limits (WELs)

| Material | Type | Value |
|------------------------------------|------|-----------|
| Chromium silicide (CAS 12018-09-6) | TWA | 0,5 mg/m3 |

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

| Material | Type | Value |
|------------------------------------|------|---------------------|
| Chromium silicide (CAS 12018-09-6) | TWA | 2 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

| Material | Value | Determinant | Specimen | Sampling time |
|------------------------------------|-----------------|-------------|---------------------|---------------|
| Chromium silicide (CAS 12018-09-6) | 0,02 mg/g | chromium | Creatinine in urine | * |
| | 0,043 µmol/mmol | chromium | 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 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 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 Wear safety glasses with side shields (or goggles).

Skin protection

- Hand protection Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

- Other Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

Hygiene measures 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 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 Not available.

Initial boiling point and boiling range Not available.

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 Not available.

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

Molecular formula CrSi₂

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.

10.4. Conditions to avoid Contact with incompatible materials.

10.5. Incompatible materials None known.

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 Prolonged inhalation may be harmful.

Skin contact Due to lack of data the classification is not possible.

Eye contact Due to lack of data the classification is not possible.

Ingestion Due to lack of data the classification is not possible.

Symptoms Exposure may cause temporary irritation, redness, or discomfort.

11.1. Information on toxicological effects

Acute toxicity No data available.

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 Due to partial or complete lack of data the classification is not possible.

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

Not listed.

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 Due to partial or complete lack of data the classification is not possible.

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 The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

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

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 available.

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

Chromium silicide (CAS 12018-09-6)

Chromium (Cr) 10 UG/L

Chromium (Cr) 200 UG/L

Estonia Dangerous substances in soil Data

Chromium silicide (CAS 12018-09-6)

Chromium (Cr) 100 mg/kg

Chromium (Cr) 300 mg/kg

Chromium (Cr) 800 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.

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 (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

Chromium silicide (CAS 12018-09-6)

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

Not listed.

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, as amended.

National regulations

Follow national regulation for work with chemical agents.

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

Not available.

Information on evaluation method leading to the classification of mixture

Not applicable.

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.