



PRODUCT INFORMATION 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 Amorphous Alloy LM-601
Registration number -
Document number N04
Synonyms None.
Issue date 28-March-2016
Version number 03
Revision date 25-January-2021
Supersedes date 19-February-2018

1.3. Details of the supplier of the product information sheet

Supplier

Company name Materion Brush Inc.
Address 6070 Parkland Boulevard
Mayfield Heights, OH 44124
United States

Division

Telephone 1.216.383.4019
e-mail ehs@materion.com
Contact person Theodore Knudson

1.4. Emergency telephone number 1.216.383.4019

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

Identified uses Manufacture of computer, electronic and optical products, electrical equipment
Scientific research and development
Other: Manufacture of medical and defense equipment
Uses advised against Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Consumer uses: Private households (= general public = consumers)

1.3. Details of the supplier of the safety data sheet

Supplier

Company name Materion Brush Inc.
Address 6070 Parkland Boulevard
Mayfield Heights, OH 44124
United States

Division

Telephone 1.216.383.4019
e-mail ehs@materion.com
Contact person Theodore Knudson

1.4. Emergency telephone number 1.216.383.4019

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Health hazards

| | | |
|--------------------|------------|---|
| Skin sensitisation | Category 1 | H317 - May cause an allergic skin reaction. |
| Carcinogenicity | Category 2 | H351 - Suspected of causing cancer. |

Specific target organ toxicity - repeated exposure

Category 1 (Respiratory system)

H372 - Causes damage to organs (respiratory system) through prolonged or repeated exposure by inhalation.

Environmental hazards

Hazardous to the aquatic environment, acute aquatic hazard Category 1

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

Hazard summary Prolonged exposure may cause chronic effects.

2.2. Label elements

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

Contains: Aluminium powder (stabilised), COPPER FLAKES (COATED WITH ALIPHATIC ACID), NICKEL POWDER; [PARTICLE DIAMETER < 1MM], ZIRCONIUM POWDER, DRY (NON PYROPHORIC)

Hazard pictograms



Signal word Danger

Hazard statements

H317 May cause an allergic skin reaction.
H351 Suspected of causing cancer.
H372 Causes damage to organs (respiratory system) through prolonged or repeated exposure by inhalation.

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.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P285 In case of inadequate ventilation wear respiratory protection.

Response

P308 + P313 If exposed or concerned: Get medical advice/attention.
P341 If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
P342 + P311 If experiencing respiratory symptoms: Call a poison centre/doctor.

Storage

P405 Store locked up.

Disposal

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

Supplemental label information

For further information, please contact the Product Stewardship Department at +1.216.383.4019.

2.3. Other hazards None known.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

General information

| Chemical name | % | CAS-No. / EC No. | REACH Registration No. | Index No. | Notes |
|--|---------|------------------------|------------------------|--------------|-------|
| ZIRCONIUM POWDER, DRY (NON PYROPHORIC) | 55 - 71 | 7440-67-7 231-176-9 | - | 040-002-00-9 | |
| Classification: Flam. Sol. 2;H228, Pyr. Sol. 1;H250, Self-heat. 1;H251, Water-React. 2;H261, Skin Irrit. 2;H315, Skin Sens. 1;H317, Eye Irrit. 2;H319, STOT SE 3;H335, STOT RE 1;H372 | | | | | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) | 25 - 35 | 7440-50-8 231-159-6 | 01-2119480154-42-0080 | - | |
| Classification: - | | | | | |

| Chemical name | % | CAS-No. / EC No. | REACH Registration No. | Index No. | Notes |
|--|-------|------------------------|------------------------|--------------|-------|
| Aluminium powder (stabilised) | 2 - 5 | 7429-90-5 231-072-3 | 01-2119529243-45-0056 | 013-002-00-1 | |
| Classification: - | | | | | T |
| NICKEL POWDER; [PARTICLE DIAMETER < 1MM] | 2 - 5 | 7440-02-0 231-111-4 | 01-2119438727-29-0049 | 028-002-00-7 | |
| Classification: Skin Sens. 1;H317, STOT SE 3;H335, Carc. 2;H351, STOT RE 2;H373 | | | | | 7,S |

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. 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. Call a POISON CENTRE or doctor/physician if you feel unwell. |
| Skin contact | Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions. |
| Eye contact | Rinse with water. Get medical attention if irritation develops and persists. |
| Ingestion | Rinse mouth. Get medical attention if symptoms occur. |
| 4.2. Most important symptoms and effects, both acute and delayed | May cause respiratory irritation. Coughing. Discomfort in the chest. Shortness of breath. May cause an allergic skin reaction. Dermatitis. Rash. 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 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 | Dry powder. Dry sand. |
| 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 | Wear appropriate protective equipment and clothing during clean-up. 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. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases. |
| 6.3. Methods and material for containment and cleaning up | Stop the flow of material, if this is without risk. Prevent product from entering drains. Following product recovery, flush area with water. |
| 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. Provide adequate ventilation. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

Store locked up. Store in original tightly closed container.

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 |
|--|------|-----------------------|---------------------------|
| Aluminium powder (stabilised) (CAS 7429-90-5) | MAK | 5 mg/m ³ | Respirable fraction. |
| | | 10 mg/m ³ | Inhalable fraction. |
| | STEL | 20 mg/m ³ | Inhalable fraction. |
| | | 10 mg/m ³ | Respirable fraction. |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | MAK | 1 mg/m ³ | Inhalable fraction. |
| | | 0,1 mg/m ³ | Fume and respirable dust. |
| | STEL | 4 mg/m ³ | Inhalable fraction. |
| | | 0,4 mg/m ³ | Fume and respirable dust. |
| ZIRCONIUM POWDER, DRY (NON PYROPHORIC) (CAS 7440-67-7) | MAK | 5 mg/m ³ | Inhalable fraction. |

Austria. TRK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001

| Components | Type | Value | Form |
|--|------|-----------------------|-----------------|
| NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0) | STEL | 2 mg/m ³ | Inhalable dust. |
| | TWA | 0,5 mg/m ³ | Inhalable dust. |

Biological limit values

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

Recommended monitoring procedures

VENTILATION: 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.

Whenever possible, the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne particulate. Where utilized, exhaust inlets to the ventilation system must be positioned as close as possible to the source of airborne generation. Avoid disruption of the airflow in the area of a local exhaust inlet by equipment such as a man-cooling fan. Check ventilation equipment regularly to ensure it is functioning properly. Provide training on the use and operation of ventilation to all users. Use qualified professionals to design and install ventilation systems.

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 approved safety glasses, goggles, face shield and/or welder's helmet when risk of eye injury is present, particularly during operations that generate dust, mist or fume. |
| Skin protection | |
| - Hand protection | Wear gloves to prevent contact with particulate or solutions. Wear gloves to prevent metal cuts and skin abrasions during handling. |
| - Other | Protective overgarments or work clothing must be worn by persons who may become contaminated with particulate during activities. |
| Respiratory protection | When airborne exposures exceed or have the potential to exceed the occupational exposure limits, approved respirators must be used as specified by an Industrial Hygienist or other qualified professional. Respirator users must be medically evaluated to determine if they are physically capable of wearing a respirator. Quantitative and/or qualitative fit testing and respirator training must be satisfactorily completed by all personnel prior to respirator use. Users of tight fitting respirators must be clean shaven on those areas of the face where the respirator seal contacts the face. Use pressure-demand airline respirators when performing jobs with high potential exposures such as changing filters in a baghouse air cleaning device. |
| Thermal hazards | Not applicable. |
| 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 | 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 | Various shapes. |
| Colour | Metallic. |
| Odour | Not applicable. |
| Odour threshold | Not applicable. |
| pH | Not applicable. |
| Melting point/freezing point | 848,89 - 898,89 °C (1560 - 1650 °F) / Not applicable. |
| Initial boiling point and boiling range | Not applicable. |
| Flash point | Not applicable. |
| Evaporation rate | Not applicable. |
| Flammability (solid, gas) | Not applicable. |
| Upper/lower flammability or explosive limits | |
| Flammability limit - lower (%) | Not applicable. |
| Flammability limit - upper (%) | Not applicable. |
| Explosive limit - lower (%) | Not applicable. |
| Explosive limit - upper (%) | Not applicable. |
| Vapour pressure | 0,26 hPa estimated |
| Vapour density | Not applicable. |
| Relative density | Not applicable. |
| Solubility(ies) | |
| Solubility (water) | Not applicable. |
| Solubility (other) | Not applicable. |
| Partition coefficient (n-octanol/water) | Not available. |
| Auto-ignition temperature | Not applicable. |

| | |
|----------------------------------|----------------------------------|
| Decomposition temperature | Not applicable. |
| Viscosity | Not applicable. |
| Explosive properties | Not explosive. |
| Oxidising properties | Not oxidising. |
| 9.2. Other information | |
| Density | 8,24 g/cm ³ estimated |
| Specific gravity | 8,24 estimated |

SECTION 10: Stability and reactivity

| | |
|---|--|
| 10.1. Reactivity | Not available. |
| 10.2. Chemical stability | Not available. |
| 10.3. Possibility of hazardous reactions | Not available. |
| 10.4. Conditions to avoid | Contact with incompatible materials. |
| 10.5. Incompatible materials | Not available. |
| 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 | May cause irritation to the respiratory system. Prolonged inhalation may be harmful. |
| Skin contact | May cause an allergic skin reaction. |
| Eye contact | Direct contact with eyes may cause temporary irritation. |
| Ingestion | May cause discomfort if swallowed. However, ingestion is not likely to be a primary route of occupational exposure. |

Symptoms May cause respiratory irritation. Coughing. Discomfort in the chest. Shortness of breath. May cause an allergic skin reaction. Dermatitis. Rash.

11.1. Information on toxicological effects

| | |
|--|--|
| Acute toxicity | May cause an allergic skin reaction. May cause respiratory irritation. |
| 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. May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| Skin sensitisation | May cause an allergic skin reaction. |
| Germ cell mutagenicity | Due to partial or complete lack of data the classification is not possible. |
| Carcinogenicity | Suspected of causing cancer. |

IARC Monographs. Overall Evaluation of Carcinogenicity

NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0) 2B Possibly carcinogenic to humans.

| | |
|---|---|
| Reproductive toxicity | Due to partial or complete lack of data the classification is not possible. |
| Specific target organ toxicity - single exposure | May cause respiratory irritation. |
| 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

| Product | Species | | Test Results |
|------------------------|---------|---------|---------------------------------|
| Amorphous Alloy LM-601 | | | |
| Aquatic | | | |
| Crustacea | EC50 | Daphnia | 0,4963 mg/l, 48 hours |
| Fish | LC50 | Fish | 6,4593 mg/l, 96 hours |
| <i>Acute</i> | | | |
| Fish | LC50 | Fish | 0,0913 mg/l, 96 hours estimated |

| Components | Species | | Test Results |
|------------|---------|--|--------------|
|------------|---------|--|--------------|

COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8)

Aquatic

Acute

| | | | |
|-----------|------|---|--------------------------------|
| Crustacea | EC50 | Blue crab (<i>Callinectes sapidus</i>) | 0,0031 mg/l |
| Fish | LC50 | Fathead minnow (<i>Pimephales promelas</i>) | 0,0219 - 0,0446 mg/l, 96 hours |

NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)

Aquatic

Acute

| | | | |
|------|------|---|-------------------|
| Fish | LC50 | Rainbow trout,donaldson trout (<i>Oncorhynchus mykiss</i>) | 0,06 mg/l, 4 days |
|------|------|---|-------------------|

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

12.2. Persistence and degradability Not available.

12.3. Bioaccumulative potential Not available.

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

Bioconcentration factor (BCF) Not available.

12.4. Mobility in soil Not available.

12.5. Results of PBT and vPvB assessment Not a PBT or vPvB substance or mixture.

12.6. Other adverse effects Not available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

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

Special precautions Dispose in accordance with all applicable regulations.

SECTION 14: Transport information

ADR

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

RID

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

ADN

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

IATA

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

IMDG

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

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Aluminium powder (stabilised) (CAS 7429-90-5)

COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8)

NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)

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

NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)

ZIRCONIUM POWDER, DRY (NON PYROPHORIC) (CAS 7440-67-7)

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

Aluminium powder (stabilised) (CAS 7429-90-5)

COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8)

ZIRCONIUM POWDER, DRY (NON PYROPHORIC) (CAS 7440-67-7)

National regulations

Follow national regulation for work with chemical agents.

15.2. Chemical safety assessment

Not available.

SECTION 16: Other information

List of abbreviations

Not available.

References

Not available.

Information on evaluation method leading to the classification of mixture

The classification for health and environmental hazards is derived by a combination of calculator methods and test data, if available.

Full text of any H-statements not written out in full under Sections 2 to 15

H228 Flammable solid.

H250 Catches fire spontaneously if exposed to air.

H251 Self-heating: may catch fire.

H261 In contact with water releases flammable gases.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

H351 Suspected of causing cancer.

H372 Causes damage to organs (respiratory system) through prolonged or repeated exposure by inhalation.

H373 May cause damage to organs through prolonged or repeated exposure.

Revision information

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

Training information

Follow training instructions when handling this material.

Disclaimer

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