



MATERION

1. Chemical and company identification

| | | |
|---|---|----------------|
| Name of chemical (Product name) | Chromium Nickel Aluminum Targets | |
| Supplier's company name, address and phone number | | |
| Company name | Materion Advanced Materials | |
| Address | 6070 Parkland Boulevard Mayfield Heights, OH 44124 United States | |
| Contact person | Theodore Knudson | |
| Telephone | EH&S | 1.216.383.4019 |
| e-mail address | ehs@materion.com | |
| Emergency telephone number | See Section 16. | |
| Reference number | G19 | |

2. Hazards identification

GHS classification

| | | |
|-----------------------|---|------------|
| Physical hazards | The product is not classified according to GHS. | |
| Health hazards | Sensitization, skin | Category 1 |
| | Carcinogenicity | Category 2 |
| | Specific target organ toxicity, repeated exposure | Category 1 |
| Environmental hazards | The product is not classified according to GHS. | |

GHS label elements

Pictograms



Signal words Danger

Hazard statement May cause an allergic skin reaction. Suspected of causing cancer. Causes damage to organs through prolonged or repeated exposure.

Precautionary statement

| | |
|---|---|
| Prevention | Obtain special instructions before use. Before use, obtain special instructions and learn how to work with these products safely. Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. In case of inadequate ventilation wear respiratory protection. |
| Response | If on skin: Wash with plenty of water. If exposed or concerned: Get medical advice/attention. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse. |
| Storage | Store locked up. |
| Disposal | Dispose of contents/container in accordance with local/regional/national/international regulations. |
| Other hazards which do not result in classification | None known. |

Supplemental information

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

Main symptoms and emergency overview

| | |
|--------------------|---|
| Main symptoms | May cause an allergic skin reaction. Prolonged exposure may cause chronic effects. |
| Emergency overview | May cause an allergic skin reaction. Suspected of causing cancer. Causes damage to organs through prolonged or repeated exposure. |

3. Composition/information on ingredients

Substance or mixture Mixture

| Chemical name or generic name | CAS Number | Gazette notification | | Concentration (%) |
|-------------------------------|------------|----------------------|----------|-------------------|
| | | ENCS no. | ISHL no. | |
| Aluminum | 7429-90-5 | | | 58 - 90 |
| Chromium | 7440-47-3 | | | 30 |
| Nickel | 7440-02-0 | | | 12 |

Chemical formula Al (7429-90-5), Cr (7440-47-3), Ni (7440-02-0)

4. First aid measures

| | |
|---|--|
| If inhaled | Move to fresh air. Call a physician if symptoms develop or persist. |
| If on skin | Wash off with soap and water. Get medical attention if irritation develops and persists. |
| If in eyes | Rinse with water. If eye irritation persists: Get medical advice/attention. |
| If swallowed | Rinse mouth. Get medical attention if symptoms occur. |
| Most important symptoms/effects, acute and delayed | May cause an allergic skin reaction. Prolonged exposure may cause chronic effects. |
| Protection of first-aid responders | If exposed or concerned: get medical attention/advice. |
| Notes to physician | Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed. |

5. Fire-fighting measures

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|---|--|
| Extinguishing media | Powder. Dry sand. Water Spray or Fog. |
| Extinguishing media to avoid | Carbon dioxide (CO ₂). |
| Specific hazards | No unusual fire or explosion hazards noted. |
| Special fire fighting procedures | Move containers from fire area if you can do so without risk. |
| Protection of fire-fighters | Wear suitable protective equipment. |
| General fire hazards | No unusual fire or explosion hazards noted. |
| Specific methods | Use standard firefighting procedures and consider the hazards of other involved materials. |

6. Accidental release measures

| | |
|--|---|
| Personal precautions, protective equipment and emergency procedures | Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. For personal protection, see section 8 of the SDS. |
| Environmental precautions | Avoid discharge into drains, water courses or onto the ground. |
| Methods and materials for containment and cleaning up | Stop the flow of material, if this is without risk. For waste disposal, see section 13 of the SDS. |

7. Handling and storage

| | |
|--|--|
| Handling | |
| Technical measures (e.g. Local and general ventilation) | No specific recommendations. |
| Safe handling advice | Do not handle until all safety precautions have been read and understood. Wash hands thoroughly after handling. Use personal protection recommended in Section 8 of the SDS. |
| Contact avoidance measures | Strong acids. |
| Hygiene measures | Observe any medical surveillance requirements. Contaminated work clothing should not be allowed out of the workplace. |
| Storage | |
| Safe storage conditions | Store locked up. Store away from incompatible materials (see Section 10 of the SDS). |
| Safe packaging materials | No special precautions are necessary beyond normal good hygiene practices. See Section 8 of the SDS for additional personal protection advice when handling this product. |

8. Exposure controls/personal protection

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|---------------------------|--|
| Control parameters | Follow standard monitoring procedures. |
|---------------------------|--|

Occupational exposure limits

Japan. OELs - ISHL. (Workplace Environment Assessment Standards)

| Components | Type | Value | Form |
|--------------------------|------|-------------------------|-------|
| Aluminum (CAS 7429-90-5) | TLV | 0.025 mg/m ³ | Dust. |
| Nickel (CAS 7440-02-0) | TLV | 0.1 mg/m ³ | |

Japan. OELs - JSOH (Japan Society of Occupational Health: Recommendation of Occupational Exposure Limits)

| Components | Type | Value | Form |
|--------------------------|------|-----------------------|------------------|
| Aluminum (CAS 7429-90-5) | TWA | 2 mg/m ³ | Total dust. |
| | | 0.5 mg/m ³ | Respirable dust. |
| Chromium (CAS 7440-47-3) | TWA | 0.5 mg/m ³ | |
| Nickel (CAS 7440-02-0) | TWA | 1 mg/m ³ | |

US. ACGIH Threshold Limit Values

| Components | Type | Value | Form |
|--------------------------|------|-----------------------|----------------------|
| Aluminum (CAS 7429-90-5) | TWA | 1 mg/m ³ | Respirable fraction. |
| Chromium (CAS 7440-47-3) | TWA | 0.5 mg/m ³ | Inhalable fraction. |
| Nickel (CAS 7440-02-0) | TWA | 1.5 mg/m ³ | Inhalable fraction. |

Engineering measures

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. General ventilation normally adequate. Provide eyewash station.

Personal protective equipment

| | |
|---------------------------------|---|
| Respiratory protection | In case of inadequate ventilation, use respiratory protection. |
| Hand protection | Wear gloves to prevent metal cuts and skin abrasions during handling. |
| Eye protection | If contact is likely, safety glasses with side shields are recommended. |
| Skin and body protection | Use personal protective equipment as required. |

9. Physical and chemical properties

| | |
|--|---|
| Physical state | Solid. |
| Form | Solid. |
| Color | Grey metallic. |
| Odor | None. |
| Odor threshold | Not applicable. |
| Melting point/freezing point | 2453 °F (1345 °C) estimated / Not applicable. |
| Boiling point, initial boiling point, and boiling range | Not applicable. |
| Combustibility | None known. |
| Lower and upper explosion limit / flammability limit | |
| Explosive limit - lower (%) | Not applicable. |
| Explosive limit - lower (%) temperature | Not applicable. |
| Explosive limit - upper (%) | Not applicable. |
| Explosive limit - upper (%) temperature | Not applicable. |
| Flash point | Not applicable. |
| Auto-ignition temperature | Not applicable. |
| Decomposition temperature | Not applicable. |
| pH | Not applicable. |
| Kinematic viscosity | Not available. |
| Solubility(ies) | |
| Solubility (water) | Insoluble. |

| | |
|--|-------------------------------|
| Partition coefficient (n-octanol/water) (log value) | Not applicable. |
| Vapor pressure | Not applicable. |
| Density and/or relative density | |
| Density | 7.30 - 8.50 g/cm ³ |
| Relative density | Not applicable. |
| Vapor density | Not applicable. |
| Particle characteristics | Not available. |
| Other information | |
| Evaporation rate | Not applicable. |
| Explosive properties | Not explosive. |
| Oxidizing properties | Not oxidizing. |
| Surface tension | Not applicable. |
| Viscosity (Coefficient of viscosity) | Not applicable. |

10. Stability and reactivity

| | |
|---------------------------------------|---|
| Reactivity | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| Chemical stability | Material is stable under normal conditions. |
| Possibility of hazardous reactions | No dangerous reaction known under conditions of normal use. |
| Conditions to avoid | Contact with incompatible materials. |
| Incompatible materials | Strong acids. Strong oxidizing agents. |
| Hazardous decomposition products | No hazardous decomposition products are known. |

11. Toxicological information

| | |
|--------------------------------------|---|
| Acute toxicity | None known. |
| Skin corrosion/irritation | Not likely, due to the form of the product. |
| Serious eye damage/eye irritation | Not likely, due to the form of the product. |

Respiratory or skin sensitization

Japan Society for Occupational Health: Respiratory sensitizer

| | |
|--------------------------|------------------------------------|
| Chromium (CAS 7440-47-3) | 2 Probable respiratory sensitizer. |
| Nickel (CAS 7440-02-0) | 2 Probable respiratory sensitizer. |

Japan Society for Occupational Health: Skin sensitizer

| | |
|--------------------------|--------------------------|
| Chromium (CAS 7440-47-3) | 1 Known skin sensitizer. |
| Nickel (CAS 7440-02-0) | 1 Known skin sensitizer. |

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization May cause an allergic skin reaction.

Germ cell mutagenicity Not classified.

Carcinogenicity Suspected of causing cancer.

ACGIH Carcinogens

| | |
|--------------------------|--|
| Aluminum (CAS 7429-90-5) | A4 Not classifiable as a human carcinogen. |
| Nickel (CAS 7440-02-0) | A5 Not suspected as a human carcinogen. |

IARC Monographs. Overall Evaluation of Carcinogenicity

| | |
|--------------------------|---|
| Chromium (CAS 7440-47-3) | 3 Not classifiable as to carcinogenicity to humans. |
| Nickel (CAS 7440-02-0) | 2B Possibly carcinogenic to humans. |

Japan Society for Occupational Health: Carcinogen

| | |
|------------------------|---------------------------|
| Nickel (CAS 7440-02-0) | 1 Carcinogenic to humans. |
|------------------------|---------------------------|

NTP Report on Carcinogens

| | |
|------------------------|---|
| Nickel (CAS 7440-02-0) | Known To Be Human Carcinogen. Reasonably Anticipated to be a Human Carcinogen. |
|------------------------|---|

| | |
|--|---|
| Reproductive toxicity | Not classified. |
| Specific target organ toxicity - single exposure | Not classified. |
| Specific target organ toxicity - repeated exposure | Causes damage to organs through prolonged or repeated exposure. |
| Aspiration hazard | Not an aspiration hazard. |

12. Ecological information

Ecotoxicological data

| Product | Species | Test Results |
|----------------------------------|-----------|---------------------------------|
| Chromium Nickel Aluminum Targets | | |
| Aquatic | | |
| <i>Acute</i> | | |
| Fish | LC50 Fish | 0.3444 mg/l, 96 hours estimated |

| Components | Species | Test Results |
|------------------------|--|-------------------|
| Nickel (CAS 7440-02-0) | | |
| Aquatic | | |
| <i>Acute</i> | | |
| Fish | LC50 Rainbow trout,donaldson trout (Oncorhynchus mykiss) | 0.06 mg/l, 4 days |

| | |
|-------------------------------|---|
| Ecotoxicity | The product is not classified as environmentally hazardous. |
| Persistence and degradability | No data is available on the degradability of any ingredients in the mixture. |
| Bioaccumulation | No data available. |
| Mobility in soil | No data available for this product. |
| Hazardous to the ozone layer | No data available. |
| Other hazardous effects | No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component. |

13. Disposal considerations

| | |
|----------------------------|---|
| 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. |
| Local disposal regulations | Contract with a disposal operator licensed by the Law on Disposal and Cleaning. Dispose of contents/container in accordance with local/regional/national/international regulations. When your own wastewater treatment plant is not available, collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste. |

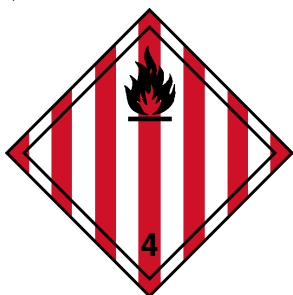
14. Transport information

IATA

| | |
|------------------------------|---|
| UN number | 3178 |
| UN proper shipping name | Flammable solid, inorganic, n.o.s. |
| Transport hazard class(es) | |
| Class | 4.1 |
| Subsidiary risk | - |
| Packing group | III |
| Environmental hazards | No. |
| ERG Code | 3L |
| Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |
| Other information | |
| Passenger and cargo aircraft | Allowed with restrictions. |
| Cargo aircraft only | Allowed with restrictions. |

IMDG

| | |
|--|---|
| UN number | 3178 |
| UN proper shipping name | FLAMMABLE SOLID, INORGANIC, N.O.S. |
| Transport hazard class(es) | |
| Class | 4.1 |
| Subsidiary risk | - |
| Packing group | III |
| Environmental hazards | |
| Marine pollutant | No. |
| EmS | F-A, S-G |
| Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |
| Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | Not applicable. |
| IATA; IMDG | |



| | |
|---------------------------------|--|
| National regulations | Follow regulation in section 15 for domestic transportation. |
| Emergency Response Guide Number | 133 |

15. Regulatory information

Industrial Safety and Health Act

Specified substances regulation

Class 2 designated chemical substances

NICKEL COMPOUNDS (POWDER, EXCLUDING NICKEL CARBONYL (ITEM NO. 24))

Notifiable substances

| | | |
|---|---------------------------|------------|
| ALUMINIUM | Table 9 Ordinance No. 37 | 58 - 90 % |
| CHROMIUM AND CHROMIUM COMPOUNDS (EXCLUDING CHROMIC ACID AND CHROMIC ACID SALTS AND DICHROMIC ACID AND DICHROMATE) | Table 9 Ordinance No. 142 | 5.0 - 30 % |
| NICKEL | Table 9 Ordinance No. 418 | 5.0 - 12 % |

Labeling substances

| | |
|---|------------|
| ALUMINIUM AND ITS WATER-SOLUBLE SALTS | 58 - 90 % |
| CHROMIUM (POWDER) | 5.0 - 30 % |
| CHROMIUM AND CHROMIUM COMPOUNDS (EXCLUDING CHROMIC ACID AND CHROMIC ACID SALTS AND DICHROMIC ACID AND DICHROMATE) | 5.0 - 30 % |

Poisonous and Deleterious Substances Control Act

Specified poisonous substances

Not regulated.

Poisonous substances

Not regulated.

Deleterious substances

Not regulated.

Act on the Regulation of Manufacture and Evaluation of Chemical Substances

Class I specified chemical substances

Not regulated.

Class II specified chemical substances

Not regulated.

Monitoring chemical substances

Not regulated.

Priority Assessment Chemical Substances (PACs)

Not regulated.

Reporting Exempted Substances

Not regulated.

Law concerning Pollutant Release and Transfer Register**Specified class 1 substances (substance name, ordinance number and content)**

NICKEL COMPOUNDS (AS NI) Ordinance No. 309 12 % (Nickel)

Class 1 substances (substance name, ordinance number and content)

CHROMIUM AND CHROMIUM(III) Ordinance No. 87 30 % (Chromium)

COMPOUNDS (AS CR)

NICKEL Ordinance No. 308 12 % (Nickel)

Class 2 substances (substance name, ordinance number and content)

Not regulated.

Ship Safety Law, Dangerous Goods Marine Transport and Storage Rule

Flammable solid materials

Air Law, Enforcement Rule

Flammable solid materials

Explosives Control Act

Not regulated.

Water Pollution Control Act

CHROMIUM

Sewage Act

CHROMIUM AND ITS COMPOUNDS, EXCEPT 2 MG/L
HEXAVALENT CHROMIUM COMPOUNDS (AS CR)

16. Other information**Bibliography**

ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
National Toxicology Program (NTP) Report on Carcinogens
Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2012
JIS Z 7252:2014 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)"
JIS Z 7253:2012 Hazard communication of chemicals based on GHS - Labelling and Safety Data Sheet (SDS)

Further information

Transportation Emergency
Call Chemtrec at:
International: 703.741.5970
Spain: 900.868.538
Switzerland: 0800.564.402

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Other information

Revised information in Section 16.