



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 | FeBCo-MgO |
| Synonyms | None. |
| Document number | 1WO |
| Materion Code | 1WO |
| Issue date | 14-August-2017 |
| Version number | 02 |
| Revision date | 12-January-2018 |
| Supersedes date | 14-August-2017 |

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

| | |
|----------------------|----------------|
| Identified uses | Not available. |
| Uses advised against | None known. |

1.3. Details of the supplier of the safety data sheet

Supplier

| | |
|----------------|---|
| Company name | Materion Advanced Chemicals Inc. |
| Address | 407 N. 13th Street 1316 W. St. Paul Avenue Milwaukee, WI 53233 United States |
| Division | Milwaukee |
| Telephone | 414.212.0257 |
| e-mail | advancedmaterials@materion.com |
| Contact person | Noreen Atkinson |

1.4. Emergency telephone number

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The mixture has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

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

Health hazards

| | | |
|---------------------------|------------|---|
| Respiratory sensitisation | Category 1 | H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| Skin sensitisation | Category 1 | H317 - May cause an allergic skin reaction. |
| Carcinogenicity | Category 2 | H351 - Suspected of causing cancer. |

Environmental hazards

| | | |
|--|------------|--|
| Hazardous to the aquatic environment, long-term aquatic hazard | Category 4 | H413 - May cause long lasting harmful effects to aquatic life. |
|--|------------|--|

Hazard summary

Suspected of causing cancer. Exposure to powder or dusts may be irritating to eyes, nose and throat. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. Prolonged exposure may cause chronic effects. Dangerous for the environment if discharged into watercourses. Occupational exposure to the substance or mixture may cause adverse health effects. The material as sold in solid form is generally not considered hazardous. However, if the process involves grinding, melting, cutting or any other process that causes a release of dust or fumes, hazardous levels of airborne particulate could be generated.

2.2. Label elements

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

| | |
|-----------|--------|
| Contains: | Cobalt |
|-----------|--------|

Hazard pictograms



Signal word

Danger

Hazard statements

| | |
|------|--|
| H317 | May cause an allergic skin reaction. |
| H334 | May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| H351 | Suspected of causing cancer. |
| 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. |
| P261 | Avoid breathing dust. |
| P272 | Contaminated work clothing should not be allowed out of the workplace. |
| P273 | Avoid release to the environment. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P284 | Wear respiratory protection. |

Response

| | |
|-------------|--|
| P302 + P352 | IF ON SKIN: Wash with plenty of water. |
| P304 + P340 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. |
| P308 + P313 | IF exposed or concerned: Get medical advice/attention. |
| P333 + P313 | If skin irritation or rash occurs: Get medical advice/attention. |
| P342 + P311 | If experiencing respiratory symptoms: Call a POISON CENTRE/doctor. |
| P362 + P364 | Take off contaminated clothing and wash it before reuse. |

Storage

| | |
|------|------------------|
| P405 | Store locked up. |
|------|------------------|

Disposal

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

Supplemental label information

100 % of the mixture consists of component(s) of unknown acute oral toxicity. 100 % of the mixture consists of component(s) of unknown acute dermal toxicity. 100 % of the mixture consists of component(s) of unknown acute inhalation toxicity. 100 % of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 100 % of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment. For further information, please contact the Product Stewardship Department at +1.800.862.4118.

2.3. Other hazards

Not a PBT or vPvB substance or mixture.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

General information

| Chemical name | % | CAS-No. / EC No. | REACH Registration No. | INDEX No. | Notes |
|--|---|------------------------|------------------------|--------------|-------|
| Cobalt | 1,0 - 49,9 | 7440-48-4 231-158-0 | - | 027-001-00-9 | |
| Classification: | Skin Sens. 1;H317, Resp. Sens. 1;H334, Carc. 2;H351, Aquatic Chronic 4;H413 | | | | |
| Other components below reportable levels | 50 - 99 | | | | |

List of abbreviations and symbols that may be used above

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

M: M-factor

PBT: persistent, bioaccumulative and toxic substance.

vPvB: very persistent and very bioaccumulative substance.

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition comments

The full text for all H-statements is displayed in section 16.

SECTION 4: First aid measures

General information

IF exposed or concerned: Get medical advice/attention. 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 If breathing is difficult, remove 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. If experiencing respiratory symptoms: Call a POISON CENTRE or doctor/physician.

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 Do not rub eyes. 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 Dusts may irritate the respiratory tract, skin and eyes. Coughing. Difficulty in breathing. May cause an allergic skin reaction. Dermatitis. Rash.

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 Powder. Dry sand.

Unsuitable extinguishing media Use class D extinguishing agents, dry sand or sodium chloride on 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 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. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of dust. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. 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 Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

6.3. Methods and material for containment and cleaning up Minimise dust generation and accumulation. Avoid the generation of dusts during clean-up. Collect dust using a vacuum cleaner equipped with HEPA filter. Prevent product from entering drains. Stop the flow of material, if this is without risk.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal.

Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers.

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

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimise dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Avoid release to the environment. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

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

| Components | Type | Value | Form |
|---------------------------------|------|----------------------|----------------------|
| Magnesium oxide (CAS 1309-48-4) | MAK | 5 mg/m ³ | Respirable fraction. |
| | | 5 mg/m ³ | Respirable fume. |
| | STEL | 10 mg/m ³ | Inhalable fraction. |
| | | 20 mg/m ³ | Inhalable fraction. |
| | | 20 mg/m ³ | Respirable fume. |
| | | 10 mg/m ³ | Respirable fraction. |

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

| Components | Type | Value | Form |
|------------------------|------|-----------------------|---------------------|
| Cobalt (CAS 7440-48-4) | STEL | 0,4 mg/m ³ | Inhalable fraction. |
| | TWA | 0,1 mg/m ³ | Inhalable fraction. |

Belgium. Exposure Limit Values.

| Components | Type | Value | Form |
|---------------------------------|------|------------------------|----------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,02 mg/m ³ | Dust and fume. |
| Magnesium oxide (CAS 1309-48-4) | TWA | 10 mg/m ³ | Fume. |

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

| Components | Type | Value | Form |
|---------------------------------|------|-----------------------|---------------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,1 mg/m ³ | |
| Iron (CAS 7439-89-6) | TWA | 6 mg/m ³ | Inhalable fraction. |
| Magnesium oxide (CAS 1309-48-4) | TWA | 10 mg/m ³ | |

Croatia. Dangerous Substance Exposure Limit Values in the Workplace (ELVs), Annexes 1 and 2, Narodne Novine, 13/09

| Components | Type | Value | Form |
|---------------------------------|------|-----------------------|------------------|
| Cobalt (CAS 7440-48-4) | MAC | 0,1 mg/m ³ | |
| Magnesium oxide (CAS 1309-48-4) | MAC | 4 mg/m ³ | Respirable dust. |
| | | 10 mg/m ³ | Total dust. |

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

| Components | Type | Value | Form |
|---------------------------------|------|-----------------------|----------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,1 mg/m ³ | Dust and fume. |
| Magnesium oxide (CAS 1309-48-4) | TWA | 10 mg/m ³ | Fume. |

Czech Republic. OELs. Government Decree 361

| Components | Type | Value |
|---------------------------------|---------|------------------------|
| Cobalt (CAS 7440-48-4) | Ceiling | 0,1 mg/m ³ |
| | TWA | 0,05 mg/m ³ |
| Iron (CAS 7439-89-6) | TWA | 10 mg/m ³ |
| Magnesium oxide (CAS 1309-48-4) | Ceiling | 10 mg/m ³ |
| | TWA | 5 mg/m ³ |

Denmark. Exposure Limit Values Components

| Components | Type | Value | Form |
|---------------------------------|------|------------------------|----------------|
| Cobalt (CAS 7440-48-4) | TLV | 0,01 mg/m ³ | Dust and fume. |
| Magnesium oxide (CAS 1309-48-4) | TLV | 6 mg/m ³ | |

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

| Components | Type | Value | Form |
|---------------------------------|------|------------------------|------------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,05 mg/m ³ | |
| Magnesium oxide (CAS 1309-48-4) | TWA | 5 mg/m ³ | Respirable dust. |
| | | 10 mg/m ³ | Total dust. |
| | | 1 mg/m ³ | Dust. |

Finland. Workplace Exposure Limits Components

| Components | Type | Value | Form |
|---------------------------------|------|------------------------|-------|
| Cobalt (CAS 7440-48-4) | TWA | 0,02 mg/m ³ | |
| Magnesium oxide (CAS 1309-48-4) | TWA | 10 mg/m ³ | Dust. |

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

| Components | Type | Value | Form |
|---------------------------------|------|----------------------|-------|
| Magnesium oxide (CAS 1309-48-4) | VME | 10 mg/m ³ | Fume. |

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 |
|---------------------------------|------|------------------------|----------------------|
| Boron (CAS 7440-42-8) | TWA | 0,75 mg/m ³ | Inhalable fraction. |
| Magnesium oxide (CAS 1309-48-4) | TWA | 4 mg/m ³ | Inhalable fraction. |
| | | 1,5 mg/m ³ | Respirable fraction. |

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

| Components | Type | Value | Form |
|---------------------------------|------|------------------------|----------------------|
| Magnesium oxide (CAS 1309-48-4) | AGW | 10 mg/m ³ | Inhalable fraction. |
| | | 1,25 mg/m ³ | Respirable fraction. |

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

| Components | Type | Value | Form |
|---------------------------------|------|-----------------------|----------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,1 mg/m ³ | Dust and fume. |
| Magnesium oxide (CAS 1309-48-4) | TWA | 5 mg/m ³ | Respirable. |
| | | 10 mg/m ³ | Inhalable |

Hungary. OELs. Joint Decree on Chemical Safety of Workplaces Components

| Components | Type | Value | Form |
|---------------------------------|------|-----------------------|-------------|
| Cobalt (CAS 7440-48-4) | STEL | 0,4 mg/m ³ | |
| | TWA | 0,1 mg/m ³ | |
| Magnesium oxide (CAS 1309-48-4) | STEL | 24 mg/m ³ | Respirable. |
| | TWA | 6 mg/m ³ | Respirable. |

Iceland. OELs. Regulation 154/1999 on occupational exposure limits Components

| Components | Type | Value | Form |
|---------------------------------|------|------------------------|----------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,02 mg/m ³ | Dust and fume. |
| Magnesium oxide (CAS 1309-48-4) | TWA | 6 mg/m ³ | |

Ireland. Occupational Exposure Limits Components

| Components | Type | Value | Form |
|---------------------------------|------|-----------------------|------------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,1 mg/m ³ | |
| Magnesium oxide (CAS 1309-48-4) | STEL | 10 mg/m ³ | Fume. |
| | TWA | 5 mg/m ³ | Fume. |
| | | 4 mg/m ³ | Respirable dust. |

Ireland. Occupational Exposure Limits Components**Type****Value****Form**

10 mg/m3

Total inhalable dust.

Italy. Occupational Exposure Limits Components**Type****Value****Form**

Cobalt (CAS 7440-48-4)

TWA

0,02 mg/m3

Magnesium oxide (CAS 1309-48-4)

TWA

10 mg/m3

Inhalable fraction.

Latvia. OELs. Occupational exposure limit values of chemical substances in work environment Components**Type****Value****Form**

Cobalt (CAS 7440-48-4)

TWA

0,5 mg/m3

Magnesium oxide (CAS 1309-48-4)

TWA

2 mg/m3

Dust.

2 mg/m3

Lithuania. OELs. Limit Values for Chemical Substances, General Requirements**Components****Type****Value**

Cobalt (CAS 7440-48-4)

TWA

0,05 mg/m3

Magnesium oxide (CAS 1309-48-4)

TWA

4 mg/m3

Netherlands. OELs (binding)**Components****Type****Value****Form**

Cobalt (CAS 7440-48-4)

TWA

0,02 mg/m3

Dust and fume.

Norway. Administrative Norms for Contaminants in the Workplace**Components****Type****Value****Form**

Cobalt (CAS 7440-48-4)

TLV

0,02 mg/m3

Fume.

Magnesium oxide (CAS 1309-48-4)

TLV

10 mg/m3

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

Cobalt (CAS 7440-48-4)

TWA

0,02 mg/m3

Magnesium oxide (CAS 1309-48-4)

TWA

10 mg/m3

Inhalable fraction.

Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796)**Components****Type****Value****Form**

Cobalt (CAS 7440-48-4)

TWA

0,02 mg/m3

Magnesium oxide (CAS 1309-48-4)

TWA

10 mg/m3

Inhalable fraction.

Romania. OELs. Protection of workers from exposure to chemical agents at the workplace**Components****Type****Value****Form**

Cobalt (CAS 7440-48-4)

STEL

0,1 mg/m3

Magnesium oxide (CAS 1309-48-4)

TWA

0,05 mg/m3

STEL

15 mg/m3

Fume.

TWA

5 mg/m3

Fume.

Slovakia. OELs. Regulation No. 300/2007 concerning protection of health in work with chemical agents**Components****Type****Value****Form**

Cobalt (CAS 7440-48-4)

TWA

0,05 mg/m3

Iron (CAS 7439-89-6)

TWA

6 mg/m3

Magnesium oxide (CAS 1309-48-4)

TWA

4 mg/m3

Respirable fraction.

10 mg/m3

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**

Cobalt (CAS 7440-48-4)

TWA

0,1 mg/m3

Inhalable fraction.

Spain. Occupational Exposure Limits Components

| Components | Type | Value | Form |
|---------------------------------|------|------------------------|----------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,02 mg/m ³ | |
| Magnesium oxide (CAS 1309-48-4) | TWA | 10 mg/m ³ | Dust and fume. |

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

| Components | Type | Value | Form |
|---------------------------------|------|------------------------|------------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,02 mg/m ³ | Inhalable dust. |
| Magnesium oxide (CAS 1309-48-4) | TWA | 5 mg/m ³ | Respirable dust. |
| | | 10 mg/m ³ | Inhalable dust. |

Switzerland. SUVA Grenzwerte am Arbeitsplatz Components

| Components | Type | Value | Form |
|---------------------------------|------|------------------------|---------------------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,05 mg/m ³ | Dust/aerosol, inhalable. |
| Magnesium oxide (CAS 1309-48-4) | TWA | 3 mg/m ³ | Respirable dust. |
| | | 3 mg/m ³ | Fume and respirable dust. |

UK. EH40 Workplace Exposure Limits (WELs) Components

| Components | Type | Value | Form |
|---------------------------------|------|-----------------------|------------------------------|
| Cobalt (CAS 7440-48-4) | TWA | 0,1 mg/m ³ | |
| Magnesium oxide (CAS 1309-48-4) | TWA | 4 mg/m ³ | Respirable dust and/or fume. |
| | | 10 mg/m ³ | Inhalable dust. |

Biological limit values**Finland. HTP-arvot, App 2., Biological Limit Values, (BRA/BGV) , Social Affairs and Ministry of Health Components**

| Components | Value | Determinant | Specimen | Sampling time |
|------------------------|------------|-------------|----------|---------------|
| Cobalt (CAS 7440-48-4) | 130 nmol/l | Cobalt | Urine | * |

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

France. Biological indicators of exposure (IBE) (National Institute for Research and Security (INRS, ND 2065) Components

| Components | Value | Determinant | Specimen | Sampling time |
|------------------------|---------|-------------|----------|---------------|
| Cobalt (CAS 7440-48-4) | 15 µg/l | Cobalt | Urine | * |
| | 1 µg/l | Cobalt | Blood | * |

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

Hungary. Chemical Safety at Workplace Ordinance Joint Decree No. 25/2000 (Annex 2): Permissible limit values of biological exposure (effect) indices Components

| Components | Value | Determinant | Specimen | Sampling time |
|------------------------|-----------------|-------------|---------------------|---------------|
| Cobalt (CAS 7440-48-4) | 0,03 mg/g | Cobalt | Creatinine in urine | * |
| | 0,058 µmol/mmol | Cobalt | Creatinine in urine | * |

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

Slovakia. BLVs (Biological Limit Value). Regulation no. 355/2006 concerning protection of workers exposed to chemical agents, Annex 2 Components

| Components | Value | Determinant | Specimen | Sampling time |
|------------------------|------------|-------------|---------------------|---------------|
| Cobalt (CAS 7440-48-4) | 20,03 µg/g | Cobalt | Creatinine in urine | * |
| | 30 µg/l | Cobalt | Urine | * |

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

Spain. Biological Limit Values (VLBs), Occupational Exposure Limits for Chemical Agents, Table 4 Components

| Components | Value | Determinant | Specimen | Sampling time |
|------------------------|---------|-------------|----------|---------------|
| Cobalt (CAS 7440-48-4) | 15 µg/l | Cobalto | Urine | * |
| | 1 µg/l | Cobalto | Blood | * |

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

Switzerland. BAT-Werte (Biological Limit Values in the Workplace as per SUVA) Components

| Components | Value | Determinant | Specimen | Sampling time |
|------------------------|---------|-------------|----------|---------------|
| Cobalt (CAS 7440-48-4) | 30 µg/l | Cobalt | 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. If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL (occupational exposure limit), suitable respiratory protection must be worn. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits.

Individual protection measures, such as personal protective equipment

General information

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

Eye/face protection

Chemical respirator with organic vapour cartridge, full facepiece, dust and mist filter.

Skin protection

- Hand protection

Wear appropriate chemical resistant gloves.

- Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection

Chemical respirator with organic vapour cartridge, full facepiece, dust and mist filter.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

Hygiene measures

Observe any medical surveillance requirements. 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. Contaminated work clothing should not be allowed out of the workplace.

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

Not available.

Form

Liquid. Powder.

Colour

Not available.

Odour

Not available.

Odour threshold

Not available.

pH

Not available.

Melting point/freezing point

1495 °C (2723 °F) estimated

Initial boiling point and boiling range

2861 °C (5181,8 °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

0,00001 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 | 580 °C (1076 °F) estimated |
| Decomposition temperature | Not available. |
| Viscosity | Not available. |
| Explosive properties | Not explosive. |
| Oxidising properties | Not oxidising. |

9.2. Other information

| | |
|-------------------------|----------------------------------|
| Density | 2,54 g/cm ³ estimated |
| Specific gravity | 2,54 estimated |

SECTION 10: Stability and reactivity

| | |
|---|---|
| 10.1. Reactivity | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| 10.2. Chemical stability | Material is stable under normal conditions. |
| 10.3. Possibility of hazardous reactions | No dangerous reaction known under conditions of normal use. |
| 10.4. Conditions to avoid | Contact with incompatible materials. |
| 10.5. Incompatible materials | Strong oxidising agents. Phosphorus. Chlorine. |
| 10.6. Hazardous decomposition products | No hazardous decomposition products are known. |

SECTION 11: Toxicological information

General information Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

Inhalation May cause allergy or asthma symptoms or breathing difficulties if inhaled. Dust may irritate respiratory system. Prolonged inhalation may be harmful.

Skin contact Dust or powder may irritate the skin. May cause an allergic skin reaction.

Eye contact Dust may irritate the eyes.

Ingestion May cause discomfort if swallowed. However, ingestion is not likely to be a primary route of occupational exposure.

Symptoms Dusts may irritate the respiratory tract, skin and eyes. Coughing. Difficulty in breathing. May cause an allergic skin reaction. Dermatitis. Rash.

11.1. Information on toxicological effects

| | |
|--|---|
| Acute toxicity | Not known. |
| 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 | 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. |

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

Cobalt (CAS 7440-48-4) 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 | 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 | May cause long lasting harmful effects to aquatic life. Based on available data, the classification criteria are not met for hazardous to the aquatic environment, acute hazard. |
| 12.2. Persistence and degradability | |
| 12.3. Bioaccumulative potential | No data available. |
| Partition coefficient n-octanol/water (log Kow) | Not available. |
| Bioconcentration factor (BCF) | Not available. |
| 12.4. Mobility in soil | No data available. |
| 12.5. Results of PBT and vPvB assessment | Not a PBT or vPvB substance or mixture. |
| 12.6. Other adverse effects | No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component. |

12.7. Additional information

Estonia Dangerous substances in groundwater Data

Cobalt (CAS 7440-48-4)

Cobalt (Co) 300 UG/L

Cobalt (Co) 5 UG/L

Estonia Dangerous substances in soil Data

Cobalt (CAS 7440-48-4)

Cobalt (Co) 20 mg/kg

Cobalt (Co) 300 mg/kg

Cobalt (Co) 50 mg/kg

SECTION 13: Disposal considerations

13.1. Waste treatment methods

| | |
|-------------------------------------|--|
| Residual waste | Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). |
| Contaminated packaging | Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. |
| EU waste code | The Waste code should be assigned in discussion between the user, the producer and the waste disposal company. |
| Disposal methods/information | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations. |
| Special precautions | Dispose in accordance with all applicable regulations. |

SECTION 14: Transport information

ADR

14.1. - 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

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

Not listed.

Other regulations

Pregnant women should not work with the product, if there is the least risk of exposure. The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended. Additional information is given in the Safety Data Sheet.

National regulations

Follow national regulation for work with chemical agents. Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended.

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

Not available.

Information on evaluation method leading to the classification of mixture

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

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.