SAFETY DATA SHEET
Cobalt (pieces)

1. Identification

Product identifier
Product name Cobalt (pieces)
Internal identification Replaces M-1000-035

Recommended use of the chemical and restrictions on use
Application Exterior surface coating.
Uses advised against No specific uses advised against are identified.

Details of the supplier of the safety data sheet
Supplier Kurt J Lesker Company
Manufacturer Kurt J Lesker Company
1925 Route 51
Jefferson Hills, PA 15025
+1 412-387-9200

Kurt J Lesker Company LTD
United Kingdom
15-16 Burgess Road
Hastings, East Sussex, TN35 4NR
England
Customer Service: +44 (0) 1424 458100
msds@lesker.com

Emergency telephone number
Emergency telephone North America [USA, Canada, Mexico]: 1-866-519-4752
Mainland China: (+86) 4001 2001 74
Europe: (int'l call prefix)-1-760-476-3961
Asia Pacific: (int'l call prefix)-1-760-476-3960
Middle East & Africa: (int'l call prefix)-1-760-476-3959

2. Hazard(s) identification

Classification of the substance or mixture
Physical hazards Not Classified
Environmental hazards Aquatic Chronic 4 - H413
Cobalt (pieces)

Pictogram

Signal word

Danger

Hazard statements

H317 May cause an allergic skin reaction.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H413 May cause long lasting harmful effects to aquatic life.

Precautionary statements

P261 Avoid breathing vapor/ spray.
P273 Avoid release to the environment.
P302+P352 If on skin: Wash with plenty of water.
P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.
P333+P313 If skin irritation or rash occurs: Get medical advice/ attention.
P342+P311 If experiencing respiratory symptoms: Call a poison center/ doctor.

Contains

Cobalt

Other hazards

This product does not contain any substances classified as PBT or vPvB.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Cobalt</th>
<th>0 - 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 7440-48-4</td>
<td></td>
</tr>
</tbody>
</table>

Classification

Resp. Sens. 1 - H334
Skin Sens. 1 - H317
Aquatic Chronic 4 - H413

The Full Text for all Hazard Statements are Displayed in Section 16.

4. First-aid measures

Description of first aid measures

General information

Get medical attention if any discomfort continues. Show this Safety Data Sheet to the medical personnel.

Inhalation

Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as collar, tie or belt. Rinse nose and mouth with water. Never give anything by mouth to an unconscious person. Get medical attention if symptoms are severe or persist. In the event of any sensitization symptoms developing, ensure further exposure is avoided.

Ingestion

Rinse mouth thoroughly with water. Get medical advice/attention if you feel unwell. Do not induce vomiting unless under the direction of medical personnel.

Skin Contact

It is important to remove the substance from the skin immediately. In the event of any sensitization symptoms developing, ensure further exposure is avoided. Remove contamination with soap and water or recognized skin cleansing agent. Get medical attention if symptoms are severe or persist after washing.

Eye contact

Rinse with water. Get medical attention if any discomfort continues.
Cobalt (pieces)

**Protection of first aiders**
First aid personnel should wear appropriate protective equipment during any rescue.

**Most important symptoms and effects, both acute and delayed**

**General information**
The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

**Inhalation**
May cause sensitization or allergic reactions in sensitive individuals.

**Ingestion**
May cause sensitization or allergic reactions in sensitive individuals.

**Skin contact**
May cause skin sensitization or allergic reactions in sensitive individuals. Prolonged contact may cause dryness of the skin.

**Eye contact**
No specific symptoms known. May be slightly irritating to eyes.

**Indication of immediate medical attention and special treatment needed**

**Notes for the doctor**
Treat symptomatically. May cause sensitization or allergic reactions in sensitive individuals.

### 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**
The product is not flammable. Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.

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

**Special hazards arising from the substance or mixture**

**Specific hazards**
None known.

**Hazardous combustion products**
Thermal decomposition or combustion products may include the following substances:
Harmful gases or vapors.

**Advice for firefighters**

**Protective actions during firefighting**
Avoid breathing fire gases or vapors. Evacuate area. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. Avoid discharge to the aquatic environment. Control run-off water by containing and keeping it out of sewers and watercourses. If risk of water pollution occurs, notify appropriate authorities.

**Special protective equipment for firefighters**
Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Standard Firefighter's clothing including helmets, protective boots and gloves will provide a basic level of protection for chemical incidents.

### 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**Personal precautions**
Wear protective clothing as described in Section 8 of this safety data sheet. No action shall be taken without appropriate training or involving any personal risk. Avoid inhalation of dust and vapors. Use suitable respiratory protection if ventilation is inadequate. Avoid contact with skin and eyes.

**Environmental precautions**

**Environmental precautions**
Avoid discharge into drains or watercourses or onto the ground. Avoid discharge to the aquatic environment.

**Methods and material for containment and cleaning up**
Cobalt (pieces)

Methods for cleaning up
Wear protective clothing as described in Section 8 of this safety data sheet. Clear up spills immediately and dispose of waste safely. Collect spillage with a shovel and broom, or similar and reuse, if possible. Collect and place in suitable waste disposal containers and seal securely. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. Dangerous for the environment. Do not empty into drains. For waste disposal, see Section 13.

Reference to other sections
For personal protection, see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.

7. Handling and storage

Precautions for safe handling
Read and follow manufacturer’s recommendations. Wear protective clothing as described in Section 8 of this safety data sheet. Keep away from food, drink and animal feeding stuffs. Keep container tightly sealed when not in use. Avoid discharge to the aquatic environment. Do not handle until all safety precautions have been read and understood. Do not handle broken packages without protective equipment. Do not reuse empty containers.

Advice on general occupational hygiene
Wash promptly if skin becomes contaminated. Take off contaminated clothing and wash before reuse. Wash contaminated clothing before reuse.

Conditions for safe storage, including any incompatibilities
Storage precautions
Keep only in the original container. Keep container tightly closed, in a cool, well ventilated place. Keep containers upright. Protect containers from damage.

Storage class
Miscellaneous hazardous material storage.

Specific end uses(s)
The identified uses for this product are detailed in Section 1.2.

8. Exposure Controls/personal protection

Control parameters
Occupational exposure limits
Cobalt
Long-term exposure limit (8-hour TWA): OSHA 0.1 mg/m³ dust and fume as Co
Long-term exposure limit (8-hour TWA): ACGIH 0.02 mg/m³ as Co
A3
ACGIH = American Conference of Governmental Industrial Hygienists.
A3 = Confirmed Animal Carcinogen with Unknown Relevance to Humans.

Cobalt (CAS: 7440-48-4)

Immediate danger to life and health
20 mg/m³

Exposure controls
Protective equipment

Immediate danger to life and health
20 mg/m³

Exposure controls
Protective equipment
Cobalt (pieces)

**Appropriate engineering controls**
Provide adequate ventilation. Observe any occupational exposure limits for the product or ingredients.

**Eye/face protection**
Unless the assessment indicates a higher degree of protection is required, the following protection should be worn: Tight-fitting safety glasses.

**Hand protection**
It is recommended that chemical-resistant, impervious gloves are worn. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. To protect hands from chemicals, gloves should comply with OSHA 1910.138 and be demonstrated to be impervious to the chemical and resist degradation. Considering the data specified by the glove manufacturer, check during use that the gloves are retaining their protective properties and change them as soon as any deterioration is detected. Frequent changes are recommended.

**Other skin and body protection**
May cause skin sensitization or allergic reactions in sensitive individuals. Wear appropriate clothing to prevent repeated or prolonged skin contact.

**Hygiene measures**
Wash hands thoroughly after handling. Wash at the end of each work shift and before eating, smoking and using the toilet. Do not eat, drink or smoke when using this product.

**Respiratory protection**
Ensure all respiratory protective equipment is suitable for its intended use and is NIOSH approved. Check that the respirator fits tightly and the filter is changed regularly. Gas and combination filter cartridges should comply with OSHA 1910.134. Full face mask respirators with replaceable filter cartridges should comply with OSHA 1910.134. Half mask and quarter mask respirators with replaceable filter cartridges should comply with OSHA 1910.134.

**Environmental exposure controls**
Keep container tightly sealed when not in use. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### 9. Physical and Chemical Properties

**Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Solid.</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Black.</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>No characteristic odor.</td>
</tr>
<tr>
<td><strong>Odor threshold</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Melting point</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Initial boiling point and range</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Evaporation rate</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Upper/lower flammability or explosive limits</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Vapor pressure</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Vapor density</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Relative density</strong></td>
<td>8.9 @ 25°C</td>
</tr>
<tr>
<td><strong>Bulk density</strong></td>
<td>Not available.</td>
</tr>
</tbody>
</table>
Cobalt (pieces)

**Solubility(ies)**
- Insoluble in water.

**Partition coefficient**
- Not applicable.

**Auto-ignition temperature**
- Not applicable.

** Decomposition Temperature**
- Not available.

**Viscosity**
- Not applicable.

**Molecular weight**
- 58.69

10. **Stability and reactivity**

**Reactivity**
- There are no known reactivity hazards associated with this product.

**Stability**
- Stable at normal ambient temperatures and when used as recommended. Stable under the prescribed storage conditions.

**Possibility of hazardous reactions**
- No potentially hazardous reactions known.

**Conditions to avoid**
- There are no known conditions that are likely to result in a hazardous situation.

**Materials to avoid**
- No specific material or group of materials is likely to react with the product to produce a hazardous situation.

**Hazardous decomposition products**
- Does not decompose when used and stored as recommended. Thermal decomposition or combustion products may include the following substances: Harmful gases or vapors.

11. **Toxicological information**

**Information on toxicological effects**

**Acute toxicity - oral**
- Based on available data the classification criteria are not met.

**Notes (oral LD₅₀)**
- Based on available data the classification criteria are not met.

**Acute toxicity - dermal**
- Based on available data the classification criteria are not met.

**Notes (dermal LD₅₀)**
- Based on available data the classification criteria are not met.

**Acute toxicity - inhalation**
- Based on available data the classification criteria are not met.

**Notes (inhalation LC₅₀)**
- Based on available data the classification criteria are not met.

**Skin corrosion/irritation**
- Based on available data the classification criteria are not met.

**Animal data**
- Based on available data the classification criteria are not met.

**Serious eye damage/irritation**
- Based on available data the classification criteria are not met.

**Respiratory sensitization**
- There is evidence that the product can cause respiratory hypersensitivity.

**Skin sensitization**
- May cause skin sensitization or allergic reactions in sensitive individuals.

**Germ cell mutagenicity**
- Genotoxicity - in vitro
- Based on available data the classification criteria are not met.

**Carcinogenicity**
- Based on available data the classification criteria are not met.
Cobalt (pieces)

IARC carcinogenicity
None of the ingredients are listed or exempt.

Reproductive toxicity
Reproductive toxicity - fertility
Based on available data the classification criteria are not met.

Reproductive toxicity - development
Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure
STOT - single exposure
Not classified as a specific target organ toxicant after a single exposure.

Specific target organ toxicity - repeated exposure
STOT - repeated exposure
Not classified as a specific target organ toxicant after repeated exposure.

Aspiration hazard
Aspiration hazard
Not relevant. Solid.

General information
The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

Inhalation
May cause sensitization or allergic reactions in sensitive individuals.

Ingestion
May cause sensitization or allergic reactions in sensitive individuals.

Skin Contact
May cause skin sensitization or allergic reactions in sensitive individuals. Prolonged contact may cause dryness of the skin.

Eye contact
No specific symptoms known.

Route of entry
Ingestion Inhalation Skin and/or eye contact

Target Organs
No specific target organs known.

Medical considerations
Skin disorders and allergies.

12. Ecological Information

Toxicity
Toxicity
Aquatic Chronic 4 - H413 May cause long lasting harmful effects to aquatic life.

Persistence and degradability
Persistence and degradability
The degradability of the product is not known.

Bioaccumulative potential
Bio-Accumulative Potential
No data available on bioaccumulation.

Partition coefficient
Not applicable.

Mobility in soil
Mobility
No data available.

Other adverse effects
Other adverse effects
None known.

13. Disposal considerations

Waste treatment methods
Cobalt (pieces)

General information
The generation of waste should be minimized or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of in a safe way. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Empty containers or liners may retain some product residues and hence be potentially hazardous.

Disposal methods
Dispose of surplus products and those that cannot be recycled via a licensed waste disposal contractor. Waste, residues, empty containers, discarded work clothes and contaminated cleaning materials should be collected in designated containers, labeled with their contents. Incineration or landfill should only be considered when recycling is not feasible.

14. Transport information

General
The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, DoT).

UN Number
Not applicable.

UN proper shipping name
Not applicable.

Transport hazard class(es)
No transport warning sign required.

Packing group
Not applicable.

Environmental hazards
Environmentally Hazardous Substance
No.

Special precautions for user
Not applicable.

Transport in bulk according to
Annex II of MARPOL 73/78 and the IBC Code
Not applicable.

15. Regulatory information

US Federal Regulations
SARA Section 302 Extremely Hazardous Substances Tier II Threshold Planning Quantities
None of the ingredients are listed or exempt.

CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA)
None of the ingredients are listed or exempt.

SARA Extremely Hazardous Substances EPCRA Reportable Quantities
None of the ingredients are listed or exempt.

SARA 313 Emission Reporting
None of the ingredients are listed or exempt.
Cobalt (pieces)

**CAA Accidental Release Prevention**
None of the ingredients are listed or exempt.

**FDA - Essential Chemical**
None of the ingredients are listed or exempt.

**FDA - Precursor Chemical**
None of the ingredients are listed or exempt.

**SARA (311/312) Hazard Categories**
None of the ingredients are listed or exempt.

**OSHA Highly Hazardous Chemicals**
None of the ingredients are listed or exempt.

**US State Regulations**
- **California Proposition 65 Carcinogens and Reproductive Toxins**
  None of the ingredients are listed or exempt.
- **California Air Toxics "Hot Spots" (A-I)**
  None of the ingredients are listed or exempt.
- **California Air Toxics "Hot Spots" (A-II)**
  None of the ingredients are listed or exempt.
- **California Directors List of Hazardous Substances**
  None of the ingredients are listed or exempt.
- **Massachusetts "Right To Know" List**
  None of the ingredients are listed or exempt.
- **Rhode Island "Right To Know" List**
  None of the ingredients are listed or exempt.
- **Minnesota "Right To Know" List**
  None of the ingredients are listed or exempt.
- **New Jersey "Right To Know" List**
  None of the ingredients are listed or exempt.
- **Pennsylvania "Right To Know" List**
  None of the ingredients are listed or exempt.

**Inventories**
- **US - TSCA**
  All the ingredients are listed or exempt.
- **US - TSCA 12(b) Export Notification**
  None of the ingredients are listed or exempt.

### 16. Other information

**Training advice**
Only trained personnel should use this material.

**Revision comments**
NOTE: Lines within the margin indicate significant changes from the previous revision.

**Issued by**
HS&E Manager.
Cobalt (pieces)

Revision date: 3/16/2017
Revision: 5
Supersedes date: 12/21/2015
SDS No.: 4642
SDS status: Approved.

Hazard statements in full:
- H317 May cause an allergic skin reaction.
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H413 May cause long lasting harmful effects to aquatic life.

End of SDS

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.