# SAFETY DATA SHEET
## Cobalt Iron Boron (pieces)

## 1. Identification

<table>
<thead>
<tr>
<th><strong>Product identifier</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product name</strong></td>
<td>Cobalt Iron Boron (pieces)</td>
</tr>
<tr>
<td><strong>Internal identification</strong></td>
<td>M-3000-051</td>
</tr>
</tbody>
</table>

### Recommended use of the chemical and restrictions on use

<table>
<thead>
<tr>
<th><strong>Application</strong></th>
<th>Physical vapor deposition of thin films</th>
</tr>
</thead>
</table>

**Uses advised against:**
This product is designed for use by technically competent persons. Any use of this product, other than for its stated use, should not be attempted without expert review.

### Details of the supplier of the safety data sheet

<table>
<thead>
<tr>
<th><strong>Supplier</strong></th>
<th>Kurt J Lesker Company</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer</strong></td>
<td>Kurt J Lesker Company</td>
</tr>
<tr>
<td></td>
<td>1925 Route 51</td>
</tr>
<tr>
<td></td>
<td>Jefferson Hills, PA 15025</td>
</tr>
<tr>
<td></td>
<td>+1 412-387-9200</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th><strong>Emergency telephone</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North America [USA, Canada, Mexico]</strong></td>
<td>1-866-519-4752</td>
</tr>
<tr>
<td><strong>Mainland China</strong></td>
<td>(+86) 4001 2001 74</td>
</tr>
<tr>
<td><strong>Europe</strong></td>
<td>(int'l call prefix)-1-760-476-3961</td>
</tr>
<tr>
<td><strong>Asia Pacific</strong></td>
<td>(int'l call prefix)-1-760-476-3960</td>
</tr>
<tr>
<td><strong>Middle East &amp; Africa</strong></td>
<td>(int'l call prefix)-1-760-476-3959</td>
</tr>
</tbody>
</table>

## 2. Hazard(s) identification

### Classification of the substance or mixture

<table>
<thead>
<tr>
<th><strong>Physical hazards</strong></th>
<th>Not Classified</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental hazards</strong></td>
<td>Aquatic Chronic 4 - H413</td>
</tr>
</tbody>
</table>

### Label elements
Cobalt Iron Boron (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.
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.
P362+P364 Take off contaminated clothing and wash it before reuse.

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>Boron (powder and pieces)</th>
<th>0 - 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 7440-42-8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Iron (pieces)</th>
<th>0 - 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 7439-89-6</td>
<td></td>
</tr>
</tbody>
</table>

<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
- Not Classified
- Resp. Sens. 1 - H334
- Skin Sens. 1 - H317
- Aquatic Chronic 4 - H413

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

Composition comments
The exact percentage is withheld as a trade secret in accordance with 29 CFR 1910.1200.

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.
Cobalt Iron Boron (pieces)

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.

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
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
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.

Protective actions during firefighting
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.
Cobalt Iron Boron (pieces)

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

Methods and material for containment and cleaning up

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

Usage precautions
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. 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)

Specific end use(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 as Co
Long-term exposure limit (8-hour TWA): ACGIH 0.02 mg/m³ as Co
A3
Cobalt Iron Boron (pieces)

OSHA = Occupational Safety and Health Administration.
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**

Provide adequate ventilation. Observe any occupational exposure limits for the product or ingredients.

**Appropriate engineering controls**

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

**Eye/face 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.

**Hand 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>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Solid.</td>
</tr>
<tr>
<td>Color</td>
<td>Various colors.</td>
</tr>
<tr>
<td>Odor</td>
<td>No characteristic odor.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Melting point</td>
<td>Not available.</td>
</tr>
</tbody>
</table>
Cobalt Iron Boron (pieces)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial boiling point and range</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Bulk density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>Insoluble in water.</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

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

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

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

Skin corrosion/irritation
Cobalt Iron Boron (pieces)

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
Based on available data the classification criteria are not met.

Genotoxicity - in vitro

Carcinogenicity
Based on available data the classification criteria are not met.

IARC carcinogenicity
None of the ingredients are listed or exempt.

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

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

Persistence and degradability
The degradability of the product is not known.
Cobalt Iron Boron (pieces)

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

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
Based on available knowledge of this material, it has been determined to be non-hazardous and will not pose a risk to persons or the environment in its provided form. However, any cutting, welding, melting, grinding, or use for deposition will produce dust, fume, or particulates containing component elements of this material. Exposure to these components may present significant health hazards. Note: Fine particulate may be a combustible dust which, when dispersed in air, may present an explosion hazard.
Cobalt Iron Boron (pieces)

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

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.

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.
Cobalt Iron Boron (pieces)

New Jersey "Right To Know" List
The following ingredients are listed or exempt:
Boron (powder and pieces)
Present.

Pennsylvania "Right To Know" List
None of the ingredients are listed or exempt.

Inventories
EU - EINECS/ELINCS
All the ingredients are listed or exempt.

Canada - DSL/NDSL
All the ingredients are listed or exempt.

US - TSCA
All the ingredients are listed or exempt.
Boron (powder and pieces)
Present.

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

Australia - AICS
All the ingredients are listed or exempt.

Japan - MITI
All the ingredients are listed or exempt.

Korea - KECI
All the ingredients are listed or exempt.

China - IECSC
All the ingredients are listed or exempt.

Philippines - PICCS
All the ingredients are listed or exempt.

New Zealand - NZIOC
All the ingredients are listed or exempt.

16. Other information

Training advice
Only trained personnel should use this material.

Revision date
1/19/2018

Revision
1

SDS No.
4882

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
Cobalt Iron Boron (pieces)

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.