## Material Safety Data Sheet

### Section 1. Chemical Product and Company Identification

<table>
<thead>
<tr>
<th>Common Name/Trade Name</th>
<th>Cobalt Metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog Number(s)</td>
<td>C1292</td>
</tr>
<tr>
<td>CAS#</td>
<td>7440-48-4</td>
</tr>
<tr>
<td>RTECS</td>
<td>GF8750000</td>
</tr>
<tr>
<td>TSCA</td>
<td>TSCA 8(b) inventory: Cobalt Metal</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>SPECTRUM LABORATORY PRODUCTS INC. 14422 S. SAN PEDRO STREET GARDENA, CA 90248</td>
</tr>
<tr>
<td>Commercial Name(s)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Synonym</td>
<td>Cobalt Metal Pieces 2&quot; and Finer</td>
</tr>
<tr>
<td>Chemical Name</td>
<td>Cobalt</td>
</tr>
<tr>
<td>Chemical Family</td>
<td>Not available.</td>
</tr>
<tr>
<td>Chemical Formula</td>
<td>Co</td>
</tr>
<tr>
<td>Supplier</td>
<td>SPECTRUM LABORATORY PRODUCTS INC. 14422 S. SAN PEDRO STREET GARDENA, CA 90248</td>
</tr>
</tbody>
</table>

### IN CASE OF EMERGENCY

CHEMTREC (24hr) 800-424-9300

CALL (310) 516-8000

### Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>TWA (mg/m³)</th>
<th>STEL (mg/m³)</th>
<th>CEIL (mg/m³)</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Cobalt Metal</td>
<td>7440-48-4</td>
<td>0.05</td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Toxicological Data on Ingredients:

**Cobalt Metal:**

- **ORAL (LD50):** Acute: 6171 mg/kg [Rat].

### Section 3. Hazards Identification

**Potential Acute Health Effects:** Slightly hazardous in case of skin contact (irritant), of ingestion. Non-irritating to the eyes. Non-hazardous in case of inhalation.

**Potential Chronic Health Effects:** Slightly hazardous in case of skin contact (sensitizer). **CARCINOGENIC EFFECTS:** Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available.

The substance may be toxic to kidneys, liver, skin, thyroid. Repeated or prolonged exposure to the substance can produce target organs damage.

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Continued on Next Page
### Section 4. First Aid Measures

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye Contact</strong></td>
<td>Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.</td>
</tr>
<tr>
<td><strong>Skin Contact</strong></td>
<td>In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.</td>
</tr>
<tr>
<td><strong>Serious Skin Contact</strong></td>
<td>Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.</td>
</tr>
<tr>
<td><strong>Serious Inhalation</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Ingestion</strong></td>
<td>Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.</td>
</tr>
<tr>
<td><strong>Serious Ingestion</strong></td>
<td>Not available.</td>
</tr>
</tbody>
</table>

### Section 5. Fire and Explosion Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flammability of the Product</strong></td>
<td>Non-flammable.</td>
</tr>
<tr>
<td><strong>Auto-Ignition Temperature</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Flash Points</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Flammable Limits</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Products of Combustion</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Fire Hazards in Presence of Various Substances</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Explosion Hazards in Presence of Various Substances</strong></td>
<td>Risks of explosion of the product in presence of mechanical impact: Not available.</td>
</tr>
<tr>
<td></td>
<td>Risks of explosion of the product in presence of static discharge: Not available.</td>
</tr>
<tr>
<td><strong>Fire Fighting Media and Instructions</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Special Remarks on Fire Hazards</strong></td>
<td>Pyrophoric cobalt decomposes acetylene in cold water and the metal becomes incandescent. When nitryl fluoride is passed at a mild warming temperature over cobalt, a glowing or white incandescence occurs. Pyrophoric cobalt, a black powder, burns brilliantly when exposed to air. Reaction of Bromine pentfluoride + cobalt powder at ambient or slightly elevated temperatures is violent, ignition often occurring.</td>
</tr>
<tr>
<td><strong>Special Remarks on Explosion Hazards</strong></td>
<td>Fused ammonium nitrate with powdered metals, including cobalt, is often violent and sometimes explosive reaction. Cobalt + hydrazinium nitrate causes an explosion.</td>
</tr>
</tbody>
</table>

### Section 6. Accidental Release Measures

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Small Spill</strong></td>
<td>Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.</td>
</tr>
<tr>
<td><strong>Large Spill</strong></td>
<td>Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.</td>
</tr>
</tbody>
</table>

*Continued on Next Page*
Section 7. Handling and Storage

Precautions
Keep locked up. Do not ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, organic materials.

Storage
Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection
Safety glasses. Lab coat. Gloves (impervious).

Personal Protection in Case of a Large Spill
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits
TWA: 0.02 (mg/m³) from ACGIH (TLV) [United States]
TWA: 0.1 (mg/m³) from OSHA (PEL) [United States]
TWA: 0.05 (mg/m³) from NIOSH [United States]
TWA: 0.02 (mg/m³) [Canada]
TWA: 0.1 [United Kingdom (UK)]

Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical state and appearance
Solid. (Metal solid. Metal pieces)

Molecular Weight
58.93 g/mole

pH (1% soln/water)
Not applicable.

Odor
Odorless.

Taste
Not available.

Color
Silver white. Silvery bluish-white. Grey.

Boiling Point
2375°C (4307°F) - 2870 C.

Melting Point
1490°C (2714°F) - 1495 C.

Critical Temperature
Not available.

Specific Gravity
8.92 (Water = 1)

Vapor Pressure
Not applicable.

Vapor Density
Not available.

Volatility
Not available.

Odor Threshold
Not available.

Water/Oil Dist. Coeff.
Not available.

Ionicity (in Water)
Not available.

Dispersion Properties
Not available.

Solubility
Insoluble in cold water, hot water.
Soluble in dilute acids.
Readily soluble in dilute nitric acid.

Section 10. Stability and Reactivity Data

Stability
The product is stable.

Instability Temperature
Not available.

Conditions of Instability
Incompatible materials

Incompatibility with various substances
Reactive with oxidizing agents, organic materials.

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## Section 11. Toxicological Information

### Routes of Entry

- Ingestion.

### Toxicity to Animals

- Acute oral toxicity (LD50): 6171 mg/kg [Rat].

### Chronic Effects on Humans

**CARCINOGENIC EFFECTS:** Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.

- May cause damage to the following organs: kidneys, liver, skin, thyroid.

### Other Toxic Effects on Humans

- Slightly hazardous in case of skin contact (irritant), of ingestion.
- Non-hazardous in case of inhalation.

### Special Remarks on Toxicity to Animals

- Not available.

### Special Remarks on Chronic Effects on Humans

- May affect genetic material (mutagenic).
- May cause cancer based on animal test data.

### Special Remarks on other Toxic Effects on Humans

**Acute Potential Health Effects:**

- Skin: May cause skin irritation in sensitive individuals
- Eyes: Not a hazard in the form of larger pieces. Dust causes eye irritation.
- Inhalation: Not an inhalation hazard in the form of larger pieces. Inhalation of dust or fumes may be harmful and cause respiratory tract irritation with coughing, difficulty breathing, shortness of breath.
- Ingestion: Low hazard. It may cause nausea, colicky abdominal pain, vomiting, hypermotility and diarrhea. It may affect the liver (diffuse hepatocellular necrosis), kidneys (acute renal failure, acute tubular necrosis), respiration (emphysema), blood, behavior/central nervous system (somnolence, ataxia)

**Chronic Potential Health Effects:**

- Skin: Prolonged or repeated skin contact may cause skin allergy (contact dermatitis).
- Inhalation: Prolonged or repeated inhalation of dust or fumes can cause an asthma-like allergy and anaphylactic reaction. Symptoms can include shortness of breath, wheezing, cough and/or chest tightness. Repeated exposure Cobalt dust may cause pneumonitis and may also scarring of the lungs (fibrosis) even if no symptoms are noticed.
- Ingestion: Prolonged or repeated ingestion may affect the heart (cardiomyopathy), thyroid (goiter), liver, and kidneys (acute renal failure, tubular necrosis, glomerulonephritis, hematuria), blood (polycythemia). It may also cause metabolic acidosis. It may also cause other symptoms similar to acute ingestion.

### Special Remarks on the Ecological Information

- Not available.

## Section 12. Ecological Information

### Ecotoxicity

- Ecotoxicity in water (LC50): >100 mg/l 96 hours [Fish (Brachydanio rerio)].

### BOD5 and COD

- Not available.

### Products of Biodegradation

- Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

### Toxicity of the Products of Biodegradation

- The product itself and its products of degradation are not toxic.

### Special Remarks on the Products of Biodegradation

- Not available.
Section 13. Disposal Considerations

Waste Disposal

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14. Transport Information

DOT Classification

Not a DOT controlled material (United States).

Identification

Not applicable.

Special Provisions for Transport

Not applicable.

DOT (Pictograms)

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations

Pennsylvania RTK: Cobalt Metal
Minnesota: Cobalt Metal
Massachusetts RTK: Cobalt Metal
Massachusetts spill list: Cobalt Metal
New Jersey: Cobalt Metal
New Jersey spill list: Cobalt Metal
California Director's List of Hazardous Substances: Cobalt Metal
TSCA 8(b) inventory: Cobalt Metal
TSCA 8(d) H and S data reporting: Cobalt Metal: Effective date: 6/01/87; Sunset date: 6/01/97
SARA 313 toxic chemical notification and release reporting: Cobalt Metal

California Proposition 65

Warnings

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.

Other Regulations

EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances (EINECS No. 231-158-0).
Canada: Listed on Canadian Domestic Substance List (DSL).
China: Listed on National Inventory.
Japan: Not listed on National Inventory (ENCS).
Korea: Listed on National Inventory (KECI).
Philippines: Listed on National Inventory (PICCS).
Australia: Listed on AICS.

Other Classifications

WHMIS (Canada)

CLASS D-2A: Material causing other toxic effects (VERY TOXIC).
Class D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC)

R42/43: May cause sensitization by inhalation and skin contact.
R53: May cause long-term adverse effects in the aquatic environment.

S22: Do not breathe dust.
S24: Avoid contact with skin.
S37: Wear suitable gloves.
S61: Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.)

Health Hazard 1
Fire Hazard 0
Reactivity 0
Personal Protection B

National Fire Protection Association (U.S.A.)

Health 1
Flammability 0
Reactivity 0
Specific hazard

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## Protective Equipment

- Gloves.
- Lab coat.
- Wear appropriate respirator when ventilation is inadequate.
- Safety glasses.

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### Section 16. Other Information

**MSDS Code**

- C4440

**References**

- Not available.

**Other Special Considerations**

- Major Uses: Heterogenous and homogeneous catalysts in hydro-treating and desulfurization oil and gas; mixed cobalt acetate/manganese-sodium bromide homogeneous catalyst for the production of terephthalic acid and dimethyl terephthalate; catalyst in the oxo synthesis (hydroformylation) for the production of alcohols and aldehydes for plastic and detergent production; used in alloys with iron, nickel, and other metals to make Alnico, an alloy of unusual magnetic strength; in Stellite alloys which are used for high-speed, heavy-duty, high temperature cutting tools; manufacture of cobalt salts; synthesis of heating fuels; catalyst in hydrocarbon refining; production of cobalt bearing alloys, cutting materials, wear-resistant materials, lacquers, varnishes, paint driers; production of inks, enamels, frits, glazes, glass decolorizer; in superalloys which are mainly used in aircraft gas turbine engines.

**Validated by Sonia Owen on 5/14/2012.**

**Verified by Sonia Owen.**

**Printed 7/2/2012.**

**CALL (310) 516-8000**

**Notice to Reader**

**Continued on Next Page**
All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.