Section 1: Product and Company Identification

Product Name: Cobalt Products
Synonym: None
Company Name
Ted Pella, Inc., P.O. Box 492477, Redding, CA 96049-2477
   Inside USA and Canada 1-800-237-3526 (Mon-Thu. 6:00AM to 4:30PM PST; Fri 6:00AM to 4:00PM PST)
   Outside USA and Canada 1-530-243-2200 (Mon-Thu. 6:00AM to 4:30PM PST; Fri 6:00AM to 4:00PM PST)
CHEMTREC USA and Canada Emergency Contact Number 1-800-424-9300 24 hours a day
CHEMTREC Outside USA and Canada Emergency Contact Number +1-703-741-5970 24 hours a day

Section 2: Hazard Identification

2.1 Classification of the substance or mixture
GHS Classification (29 CFR 1910.1200):
Cobalt - pieces, pellets, shot, sheet, foil, rod, wire, target: Not classified as hazard

2.2 Label Elements: Void on solids.

2.3 Other hazards
Classification as powder:

GHS Pictograms for powder

GHS08   GHS07

GHS Categories for powder
GHS07 – Irritant
   Skin Sens. 1   H317: May cause an allergic skin reaction.
GHS08 – Health
   Resp. Sens. 1   H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
   Carc. 2        H351: Suspected of causing cancer.

2.3 Label elements for powder

Hazard Pictograms

Signal Word: DANGER
Hazard Statements for powder
H317 May cause an allergic skin reaction.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H351 Suspected of causing cancer.

Precautionary Statements for powder
P261 Avoid breathing dust/fumes/gas/mist/vapors/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 In case of inadequate ventilation, wear respiratory protection.
P342+P311 If experiencing respiratory symptoms: Call a poison control center/doctor.
P363 Wash contaminated clothing after use.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards for powder continued
Cobalt powder/dust is flammable

Health Effects:
Powder form:
   NFPA Hazard Rating: Health: 2; Fire: 1; Reactivity: 0; Personal protection: E
   HMIS® Hazard Rating: Health: 2; Fire: 1; Reactivity: 0; Personal protection: E
   (0=least, 1=Slight, 2=Moderate, 3=High, 4=Extreme)
Other solid forms:
   NFPA Hazard Rating: ND
   HMIS® Hazard Rating: Health: 0; Fire: 0; Reactivity: 0
   (0=least, 1=Slight, 2=Moderate, 3=High, 4=Extreme)

Results of PBT and vPvB assessment: NA

Emergency overview
Appearance: Metallic grey, pieces, wire, disc or powder.
Immediate effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.
Potential health effects
Primary Routes of entry: Eyes, inhalation, ingestion.
Signs and Symptoms of Overexposure: Prolonged inhalation of cobalt dust, fumes or mist may cause serious respiratory illness. There are references in literature associating cobalt with interstitial fibrosis, a disease that can be fatal.
   Eyes: May cause irritation.
   Skin: May cause irritation. Single prolonged contact is essentially non-irritating. Repeated exposure may cause allergic dermatitis, usually occurring in the skin areas of friction. May cause cross-sensitivity to Chromium and Nickel.
   Ingestion: Amounts of ingested incidental to industrial handling are not likely to cause injury. Single dose oral toxicity is low. Ingestion of significant amounts of cobalt has been reported to have potential for causing blood, heart, thyroid and pancreatic damage.
   Inhalation: Inhalation may cause an irritation of the respiratory organs of sensitive persons resulting in obstruction of airways.
Chronic Exposure: Prolonged inhalation of cobalt dust, fumes or mist may cause serious respiratory illness.
Chemical Listed as Carcinogen or Potential Carcinogen: Classified A3 (Proven for animal.) by ACGIH. Cobalt is an OSHA Select carcinogen. NTP Report on Carcinogens lists only cobalt sulfate as "Reasonably anticipated to be a human carcinogen".
See Toxicological Information (Section 11)

**Potential environmental effects**
See Ecological Information (Section 12)

### Section 3: Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Principle Hazardous Component(s) (chemical and common name(s)) (Cas. No)</th>
<th>%</th>
<th>OSHA PEL mg/m³</th>
<th>ACGIH TLV mg/m³</th>
<th>NTP Carcinogen</th>
<th>IARC Carcinogen</th>
<th>OSHA regulated Carcinogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt (7440-48-4) EC. No. 231-158-0 Index No. 027-001-00-9</td>
<td>99.8</td>
<td>0.05¹</td>
<td>0.1</td>
<td>ND</td>
<td>2B</td>
<td>Yes</td>
</tr>
</tbody>
</table>

¹ For metal dust and fumes.

### Section 4: First Aid Measures

**If accidental overexposure is suspected**

- **Eye(s) Contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **Skin Contact:** Immediately wash with soap and water; rinse thoroughly.
- **Inhalation:** Supply fresh aid and call for a doctor. See medical treatment in case of complaints.
- **Ingestion:** If symptoms persist, consult a doctor.

**Note to physician**

- **Treatment:** ND
- **Medical Conditions generally Aggravated by Exposure:** ND

### Section 5: Fire Fighting Measures

- **Flash Point:** ND
- **Flammable Limits:** ND
- **Auto-ignition point:** ND
- **Fire Extinguishing Media:** Special powder for metal fires. Do not use water.
- **Special Fire Fighting Procedures:** None.
- **Unusual Fire and Explosion Hazards:** Powder of ≤3 microns is combustible. May generate toxic fumes.
- **Hazardous combustion products:** Toxic metal oxide fumes.
- **DOT Class (Powder form):** Flammable.

### Section 6: Accidental Release Measures

- **Steps to be Taken in Case Material is Released or Spilled:** Do not allow material to be released to environment without governmental permits. Do not allow material to reach sewage system or any water course. Do not allow to penetrate the ground/soil.
- **Waste Disposal Methods:** Dispose of waste according to Federal, State and Local Regulations.

### Section 7: Handling and Storage

- **Precautions to be taken in Handling and Storage:** Store in a cool, dry place and keep container tightly sealed. Ensure good ventilation in workplace. Prevent formation of dust. Do not store with acids or in proximity to other known incompatible materials (see section 10).
- **Storage temperature:** Room temperature to cool.
- **Storage Pressure:** NA

### Section 8: Exposure Controls / Personal Protection

- **Components with limit values that require monitoring in the workplace:**
PEL (USA) Long-term value: 0.01* mg/m$^3$. As Co; *for metal dust and fumes.
REL (USA) Long-term value: 0.05* mg/m$^3$. As Co; *for metal dust and fumes.
TLV (USA) Long-term value: 0.02 mg/m$^3$. As Co; BEI.
EL (Canada) Long-term value: 0.02 mg/m$^3$. IARC 2B.
EV (Canada) Long-term value: 0.1 mg/m$^3$. BEI.

Ingredients with biological limit values: 7440-48-4 (Cobalt 100%)

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

**Personal Protection Equipment**
Respiratory protection: Use suitable respirator when high concentrations are present.
Protective gloves: Impervious gloves. Check condition of gloves before use.
Skin protection: Protective work clothing.
Eye protection: Safety glasses.
Additional clothing and/or equipment: Safety shower and eye wash station.

**Exposure Guidelines**
See Composition/Information on Ingredients (Section 3)

**Section 9 Physical and Chemical Properties**
Appearance and Physical State: Grey solid in various forms
Odor (threshold): None (NA)
Specific Gravity (H$_2$O=1): 8.92 g/cm$^3$
Vapor Pressure (mm Hg): NA
Vapor Density (air=1): NA
Percent Volatile by volume: ND
Evaporation Rate (butyl acetate=1): NA
Boiling Point: 2927 ºC
Melting point: 1495 ºC
pH: NA
Solubility in Water: Not soluble
Molecular Weight: 58.93 g/mol

**Section 10: Stability and Reactivity**
Stability: Stable if used and stored properly.
Conditions to Avoid: ND
Materials to Avoid (Incompatibility): Hydrazinium nitrate, bromine pentafluoride, strong acids, oxidizers and acetylene.
Hazardous Decomposition Products: Metal oxide fumes.
Hazardous Polymerization: Will not occur.

**Section 11: Toxicological Information**
Results of component toxicity test performed:
LD/LC50 values for classification: Oral LD50 (Rat): 6171 mg/kg
Human experience: ND
This product **does** contain any compounds listed by NTP or IARC or regulated by OSHA as a carcinogen.
Section 12: Ecological Information
Ecological Information: Do not allow material to be released into the environment without proper government permits. Do not allow undiluted or large quantities to reach groundwater, water course, or sewage system. Avoid transfer to the environment. May cause long-lasting harmful effects to aquatic life.
Chemical Fate Information: ND

Section 13 Disposal Considerations
RCRA 40 CFR 261 Classification: ND
Consider recycling this material.
Federal, State and local laws governing disposal of materials can differ. Ensure proper disposal compliance with proper authorities before disposal.

Section 14: Transportation Information
Other solid forms are not regulated.

For powder/dust forms only.
US DOT: Proper shipping name: Metal powder, Flammable, n.o.s. (Cobalt metal, powder).
Hazard Class: 4.1
Packaging group: III
UN Number: UN3089
Limitations:
IATA: Proper shipping name: Metal powder, Flammable, n.o.s. (Cobalt metal, powder).
Hazard Class: 4.1
Packaging group: III
UN Number: UN3089
Limitations: Powder only
Domestic shipments only: ND
IMO: Proper shipping name: Metal powder, Flammable, n.o.s. (Cobalt metal, powder).
Class: 4.1
UN Number: UN3089
Packaging group: III
Marine Pollutant: No
Canadian TDG: Metal powder, Flammable, n.o.s. (Cobalt metal, powder).

Section 15: Regulatory Information
United States Federal Regulations
SARA: ND
SARA Title III (Section 313): Subject to reporting requirements.
RCRA: None
TSCA: Substance listed.
CERCLA: Substance listed.
State Regulations
California Proposition 65: Warning! This product contains the chemical(s) for which the State of California has found to cause cancer. Listed as Cobalt metal powder (7440-48-4).
International Regulations
Canada WHMIS: D2A – Very toxic material causing other toxic effects.
Europe EINECS Numbers: See section 3
Section 16: Other Information

Label Information: See section 2

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

European symbols needed: Xn - Sensitizing

Canadian WHMIS Symbols:

Abbreviations used in this document
NE= Not established
NA= Not applicable
NIF= No Information Found
ND= No Data

Disclaimer
Ted Pella, Inc. makes no warranty of any kind regarding the information furnished herein. Users should independently determine the suitability and completeness of information from all sources. While this data is presented in good faith and believed to be accurate, it should be considered only as a supplement to other information gathered by the user. It is the User's responsibility to assure the proper use and disposal of these materials as well as the safety and health of all personnel who may work with or otherwise come in contact with these materials.

SDS Form 0013F1V4