SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 PRODUCT IDENTIFIER:
   PRODUCT NAME: COBALT SULPHATE
   PRODUCT CODE: 100085
   Chemical Name: Cobalt sulphate heptahydrate
   CAS-No: 10026-24-1
   EINECS-No: 233-334-2
   Registration Number: 01-2119517426-41-0000

1.2 RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST:
   Identified uses
   Uses advised against
   See Section 7.3.
   None

1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET:
   Distributed by:
   Laguna Clay Company
   14400 Lomitas Ave
   City of Industry, CA 91746
   1-800-4Laguna
   info@lagunaclay.com
   www.lagunaclay.com

1.4 EMERGENCY TELEPHONE NUMBER:
   Carechem 24: +44 (0) 1235 239 670
   Finnish Poison Center +358 (0) 9 4711

2. HAZARDS IDENTIFICATION

2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

CLASSIFICATION ACCORDING TO DIRECTIVE 1999/45/EC OR 67/548/EEC
T; Carc. Cat 2; R49
Muta. Cat 3; R68
Repr. Cat 2; R60
Xn; R22
Xi; R36
Xn; R42/43
N; R50/53

CLASSIFICATION ACCORDING TO REGULATION (EC) NO 1272/2008
Acute oral toxicity Category 4; H302
PRODUCT NAME: COBALT SULPHATE

REVISION DATE: 08/01/2013 FORMER DATE: 05/21/2013 VERSION: 13.0 EN US

Serious eye damage/eye irritation
Respiratory sensitization
Skin sensitization
Carcinogenicity
Reproductive toxicity
Germ cell mutagenicity
Acute aquatic toxicity
Chronic aquatic toxicity

Category 2; H319
Category 1B; H334
Category 1; H317
Category 1B; H350i
Category 1B; H360F
Category 2; H341
Category 1; H400
Category 1; H410
M-Factor: 10

2.2 LABEL ELEMENTS:

SIGNAL WORD: DANGER

HAZARD STATEMENTS:
H302 - Harmful if swallowed. H317 - May cause an allergic skin reaction. H319 - Causes serious eye irritation. H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled. H341 - Suspected of causing genetic defects. H350i - May cause cancer by inhalation. H360F - May damage fertility. H410 - Very toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS:
P201 - Obtain special instructions before use. P202 - Do not handle until all safety precautions have been read and understood. P281 - Use personal protective equipment as required. P308+P313 - IF exposed or concerned: Get medical attention/advice. P405 - Store locked up. P501 - Dispose of contents/container to an approved waste disposal plant.

2.3 OTHER HAZARDS:
Not classified as PBT or vPvB.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CHEMICAL NAME:</th>
<th>PERCENT: EINECS NO:</th>
<th>REGISTRATION NUMBER:</th>
<th>WARNING SYMBOL, R PHRASES AND OTHER INFORMATION:</th>
<th>GHS CLASSIFICATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt sulphate heptahydrate 10026-24-1</td>
<td>95-100</td>
<td>233-334-2</td>
<td>01-2119517426-41-0000</td>
<td>Carc. Cat. 2; R49, Muta. Cat. 2; R68, Repr. Cat. 2; R60, Xi; R22, Xi; R36, R42/43, N; Acute Tox. 4; H302, Resp. Sens. 1B; H334, Eye Irr.2; H319, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410 M-Factor: 10</td>
</tr>
</tbody>
</table>
FURTHER INFORMATION:
Substance, inorganic salt
Cobalt Sulphate contains cobalt sulphate which has been included to the Candidate list for Substances of Very High Concern (SVHC).

4. FIRST AID MEASURES

4.1 DESCRIPTION OF FIRST AID MEASURES

EYE CONTACT:
Separate eyelids, wash the eyes thoroughly with water (15 min). If eye irritation persists, consult a specialist.

SKIN CONTACT:
Wash off with soap and plenty of water. Remove soiled or soaked clothing immediately. Wash contaminated clothing before re-use.

INHALATION:
Remove affected person from the immediate area. Ensure supply of fresh air. Irregular breathing/no breathing: artificial respiration. Consult a physician.

INGESTION:
Rinse mouth. Consult a physician.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED:
Ingestion: Abdominal pain. Vomiting. Skin/Eye contact: Redness.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED:
No special requirements.

5. FIRE FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

SUITABLE EXTINGUISHING MEDIA:
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment e.g.: Carbon dioxide (CO2), dry powder, foam, water spray.

UNSUITABLE EXTINGUISHING MEDIA:
None.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE:
In the event of fire the following can be released: Cobalt oxide dust. Cobalt sulphate dust. Sulphur oxides (SOx).

5.3 ADVICE FOR FIREFIGHTERS:
Wear self-contained breathing apparatus and protective suit. Collect contaminated fire extinguishing water separately. Neutralise with e.g. sodium hydroxide. Do not discharge into the drains/surface waters/groundwater.

6. ACCIDENTAL RELEASE MEASURES
6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURE:
Ensure adequate ventilation. Avoid breathing dust. Wear personal protective equipment. Avoid contact with skin, eyes and clothing.

6.2 ENVIRONMENTAL PRECAUTIONS:
Avoid dust formation. Do not discharge into the drains/surface waters/groundwater.

6.3 METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP:
Use mechanical handling equipment. Send in suitable containers for recovery or disposal.

6.4 REFERENCE TO OTHER SECTIONS:
For handling advice see section 7. For personal protection see section 8. For waste disposal see section 13.

### 7. HANDLING AND STORAGE

#### 7.1 PRECAUTIONS FOR SAFE HANDLING:
Avoid exposure - obtain special instructions before use. Provide good ventilation of working area (local exhaust ventilation if necessary). If workplace exposure limits are exceeded, respiratory protection approved for this particular job must be worn. Avoid contact with skin and eyes. Avoid dust formation. Contaminated work clothing should not be allowed out of the workplace. Wash hands and face before breaks and immediately after handling the product.

#### 7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES:
Always keep in containers of same material as the original one. Keep containers tightly closed in a dry, cool and well-ventilated place.

#### 7.3 SPECIFIC END USE(S):
- Manufacture of cobalt sulfate and use of cobalt sulfate in the production of cobalt carbonate
- Industrial use of cobalt sulfate in surface treatment processes
- Formulation and industrial use of cobalt sulfate as water treatment chemical, oxygen scavenger, corrosion inhibitor
- Manufacture and industrial use of batteries using cobalt sulfate
- Industrial use of cobalt sulfate in the manufacture of inorganic pigments and frits, glass, ceramic ware, varistors and magnets (calcination/sintering processes)
- Manufacture and industrial use of coatings and inks using cobalt sulfate as drier and/or pigment
- Industrial use of cobalt sulfate in the manufacture of textile dyes
- Industrial use of cobalt sulfate in the manufacture of chemicals and in other wet-chemical processes intermediate

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### 8.1 CONTROL PARAMETERS

<table>
<thead>
<tr>
<th>CHEMICAL NAME:</th>
<th>EXPOSURE LIMIT(S):</th>
<th>SOURCE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt sulphate heptahydrate</td>
<td>For metal dust and fume, as Co : 0.1 mg/m³ 0.02 mg/m³</td>
<td>OSHA PEL ACGIH TLV</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Derived No Effect Level (DNEL)</th>
<th>Oral</th>
<th>Inhalation</th>
<th>Dermal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry- Long Term- Local Effects</td>
<td>-</td>
<td>105.2 µg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Industry- Long Term- Systemic Effects</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Industry- Short Term- Local Effects</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Industry- Short Term- Systemic Effects</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Consumer- Long Term- Local Effects</td>
<td>-</td>
<td>16.6 µg/m³</td>
<td>-</td>
</tr>
</tbody>
</table>
PRODUCT NAME: COBALT SULPHATE  
REVISION DATE: 08/01/2013  
FORMER DATE: 05/21/2013  
VERSION: 13.0 EN US

| Consumer- Long Term- Systemic Effects | 25 µg/kg bw/day |
| Consumer- Short Term- Local Effects | - |
| Consumer- Short Term- Systemic Effects | - |

Predicted No Effect Concentration (PNEC)

<table>
<thead>
<tr>
<th>Compartment</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Compartment</td>
<td>0.51 µg Co/L (fresh water)</td>
</tr>
<tr>
<td>Marine Compartment</td>
<td>2.36 µg Co/L (marine water)</td>
</tr>
<tr>
<td>Aquatic Compartment- Sediment</td>
<td>11.2 mg Co/kg sediment dry wt</td>
</tr>
<tr>
<td>Aquatic Compartment-Sediment, Added Risk Approach</td>
<td>9.5 mg Co/Kg sediment dry wt</td>
</tr>
<tr>
<td>Marine Compartment- Sediment</td>
<td>9.5 mg Co/Kg sediment dry wt</td>
</tr>
<tr>
<td>Terrestrial Compartment</td>
<td>7.9 mg Co/kg Soil dw</td>
</tr>
<tr>
<td>Sewage Treatment Plant- Microorganisms</td>
<td>0.373 µg Co/L</td>
</tr>
<tr>
<td>Atmosphere Compartment</td>
<td>-</td>
</tr>
</tbody>
</table>

8.2 EXPOSURE CONTROLS

APPROPRIATE ENGINEERING CONTROLS:
Provide adequate ventilation.

PERSONAL PROTECTIVE EQUIPMENT:
EYE/FACE PROTECTION: Face-shield. Safety glasses.


RESPIRATORY PROTECTION: Use a respirator with filter model P3 (DIN 3181).

ENVIRONMENTAL EXPOSURE CONTROLS:
The employer shall fulfill requirements of IPPC Directive.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Crystalline</td>
</tr>
<tr>
<td>Colour</td>
<td>Red Brown</td>
</tr>
<tr>
<td>Odour</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>Not established.</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>735°C @ 1013 hPa</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>Not applicable.</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>The product is not flammable.</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>No data available.</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapour density</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Relative density</td>
<td>3.71</td>
</tr>
<tr>
<td>Solubility</td>
<td>376.7g/L @ 20°C. Soluble.</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

10.1 REACTIVITY:
Stable under recommended storage conditions.

10.2 CHEMICAL STABILITY:
Stable under recommended storage conditions.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS:
Stable under recommended storage conditions.

10.4 CONDITIONS TO AVOID:
Avoid dust formation. Keep away from heat.

10.5 INCOMPATIBLE MATERIALS:
Strong oxidizing agents.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS:
Sulphur oxides (SOx). Cobalt oxides.

11. TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

INFORMATION ON THE LIKELY ROUTES OF EXPOSURE:
Inhalation exposure. Dermal exposure. Oral exposure. Eye contact.

ACUTE TOXICITY:

Ingestion: LD50/oral/rat: 768 mg/kg
Main symptoms: Abdominal pain. Vomiting.

Inhalation: No data available. Adverse effects similar to ingestion will occur.
Main symptoms: Cough. Shortness of breath. Sore throat.

Skin contact: LD50/dermal: >2000 mg/kg Low acute toxicity.
Main symptoms: Redness.

Eye contact: Low acute toxicity. Main symptoms: Redness.

SKIN CORROSION/IRRITATION:
No data available.
SERIOUS EYE DAMAGE/EYE IRRITATION:
Causes serious eye irritation.

RESPIRATORY OR SKIN SENSITIZATION:
May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

GERM CELL MUTAGENICITY:
Suspected of causing genetic defects.

CARCINOGENICITY:
May cause cancer by inhalation. Tumours developed in rats and mice of both sexes at concentrations = 0.3 mg/m³ Cobalt sulfate hexahydrate.

REPRODUCTIVE TOXICITY:
May impair fertility.

SPECIFIC TARGET ORGAN SYSTEMIC TOXICITY (SINGLE EXPOSURE):
None known.

SPECIFIC TARGET ORGAN SYSTEMIC TOXICITY (REPEATED EXPOSURE):
None known.

ASPIRATION HAZARD:
Not applicable.

12. ECOLOGICAL INFORMATION

12.1 TOXICITY:
Very toxic to aquatic life. By analogy to similar materials:
Cobalt Chloride:
Fish: LC50 = 1.5 µg/l (Fresh Water);
Aquatic Invertebrates: LC50 = 0.61 mg/l (Fresh Water); 2.32 mg/l (Sea Water)
Algae: LC50 = 144 µg/l (Fresh Water); 24.1 µg/l (Sea Water)
EC10 (Fresh Water Fish) = 351.4 µg/l
NOEC Aquatic invertebrates = 5.47 µg/l (Fresh Water); 206 µg/l (Sea water)
NOEC Algae = 4.9 µg/l (Fresh water); 1.23 µg/l (Sea water)

12.2 PERSISTENCE AND DEGRADABILITY:
Not readily biodegradable. Persistent.

12.3 BIOACCUMULATIVE POTENTIAL:
Reference substance: Cobalt:
Aquatic plants: Bioconcentration factor (BCF): >100-5000
Aquatic invertebrates: BCF <300
Fresh water, Fish: BCF/BAF <10
Marine fish: BCF/BAF <10
The substance has a low potential for bioaccumulation.

12.4 MOBILITY IN SOIL:
Soluble in water.

12.5 RESULTS OF PBT AND vPvB ASSESSMENT:
Not classified as PBT or vPvB.
12.6 OTHER ADVERSE EFFECTS:
No data available.

13. DISPOSAL CONSIDERATIONS

13.1 WASTE TREATMENT METHODS:

EWC WASTE CODE: 06 03 14 - Solid salts and solutions other than those mentioned in 06 03 11 and 06 03 13. The listed waste code numbers, according to the European Waste Catalogue (EWC), are to be understood as a recommendation (2000/532/EC).

WASTE FROM RESIDUES / UNUSED PRODUCTS:
Contact manufacturer. Dispose of as special waste in compliance with local and national regulations.

CONTAMINATED PACKAGING:
Contaminated packaging should be emptied as far as possible. Packaging that cannot be cleaned should be disposed as special waste in compliance with local and national regulations.

14. TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th></th>
<th>LAND TRANSPORT:</th>
<th>SEA TRANSPORT:</th>
<th>AIR TRANSPORT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1 UN-Number</td>
<td>3077</td>
<td>3077</td>
<td>3077</td>
</tr>
<tr>
<td>14.2 UN proper shipping name</td>
<td>Environmentally hazardous substance, solid, n.o.s.</td>
<td>Environmentally hazardous substance, solid, n.o.s. (Cobalt Sulphate)</td>
<td>Environmentally hazardous substance, solid, n.o.s. (Cobalt Sulphate)</td>
</tr>
<tr>
<td>14.3 Transport hazard class(es)</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>14.4 Packing group</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>14.5 Environmental hazards</td>
<td>Environmentally Hazardous</td>
<td>Marine pollutant</td>
<td>Environmentally Hazardous</td>
</tr>
<tr>
<td>14.6 Special precautions for users</td>
<td>None.</td>
<td>EmS (Fire): F-A</td>
<td>None.</td>
</tr>
<tr>
<td>14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

15. REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENT REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE:

EU REGULATIONS: None.

 NATIONAL REGULATIONS:
PRODUCT NAME: COBALT SULPHATE
REVISION DATE: 08/01/2013 FORMER DATE: 05/21/2013 VERSION: 13.0 EN US

TSCA STATUS:
All components of this product are on the US TSCA Inventory.

TSCA 12(b) EXPORT NOTIFICATION:
No components of this product are subject to TSCA 12(b) export notification requirements.

SARA 302 EXTREMELY HAZARDOUS SUBSTANCE LIST:
This product does not contain greater than 1.0% of any chemical substance on the SARA Extremely Hazardous Substance List.

CLEAN AIR ACT S112 HAZARDOUS AIR POLLUTANTS:
Cobalt Compounds.

SARA (311, 312) HAZARD CLASS:
Acute health hazard. Chronic health hazard.

SARA SECTION 313 TOXIC CHEMICALS:
Cobalt Compounds 55%

15.2 CHEMICAL SAFETY ASSESSMENT:
A Chemical Safety Assessment has been carried out for this substance.

16. OTHER INFORMATION

LIST OF RELEVANT R-PHRASES:
R22 - Harmful if swallowed.
R36 - Irritating to eyes.
R42/43 - May cause sensitization by inhalation and skin contact.
R49 - May cause cancer by inhalation.
R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R60 - May impair fertility.
R68 - Possible risk of irreversible effects.

HAZARD STATEMENTS:
H302 - Harmful if swallowed
H317 - May cause an allergic skin reaction
H319 - Causes serious eye irritation
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H341 - Suspected of causing genetic defects
H350 - May cause cancer by inhalation
H360 - May damage fertility or the unborn child
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects.

METHOD USED FOR CLASSIFYING MIXTURE:
Not applicable.

SOURCES OF KEY DATA USED TO COMPILE THE DATASHEET:
Chemical safety report.

PREPARED BY:
Freeport Cobalt Oy

www.Lagunaclay.com 800-452-4862 info@lagunaclay.com
LIST OF ABBREVIATIONS USED IN THE SAFETY DATA SHEET:

Muta. Cat 3 = Mutagenicity Category 3
Repr. Cat. 2 = Reproductive Toxicity Category 2
Carc. Cat 2 = Carcinogenicity Category 2
Carc. 1B = Carcinogenicity Category 1B
Muta. 2 = Germ Cell Mutagenicity Category 2
Repr. 1B = Reproductive Toxicity Category 1B
Eye Irrit. 2 = Eye irritation Category 2
Acute Tox. 4 = Acute Toxicity Category 4
Resp. Sens. 1 = Respiratory Sensitization Category 1
Skin Sens. 1 = Skin Sensitization 1
Aquatic Acute 1 = Aquatic Acute Toxicity Category 1
Aquatic Chronic 1 = Aquatic Chronic Toxicity Category 1
PBT = Persistent, Bioaccumulative and Toxic
vPvB = very Persistent, very Bioaccumulative

REVISED INFORMATION:
This data sheet contains changes from the previous version in section(s): 1; 2; (Finnish version) 16;

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The information in this document is believed to be correct as of the date issued. However, no warranty of merchantability, fitness for any particular purpose, or any other warranty is expressed or is to be implied regarding the accuracy or completeness of this information, the results to be obtained from the use of this information or the product, the safety of this product, or the hazards related to its use. This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

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