1. PRODUCT AND COMPANY IDENTIFICATION

Product Identity  Cobalt impregnated silica gel
Manufacturer / Supplier  INEOS Silicas Ltd.
Address  P.O. Box 26
          Warrington
          Cheshire
          WA5 1AB
Phone Number  +44 1925 416100
Fax Number  +44 1925 416116
Emergency Phone Number  +44 1925 416100

2. COMPOSITION / INFORMATION ON THE COMPONENTS

<table>
<thead>
<tr>
<th>Component Name</th>
<th>Codes</th>
<th>Concentration</th>
<th>R Phrases</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Synthetic amorphous silica</td>
<td>112926-00-8</td>
<td>&gt; 94.00%</td>
<td>R49, R42/43, R22, R50/53</td>
<td>CC2, N</td>
</tr>
<tr>
<td>2. Cobalt chloride</td>
<td>7646-79-9</td>
<td>0.50%-2.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Water</td>
<td>7732-18-5</td>
<td>&lt; 5.00%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. HAZARD IDENTIFICATION

Main Hazards  May cause cancer by inhalation. May cause sensitisation by inhalation and skin contact. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

4. FIRST AID MEASURES

First Aid - Eyes  Wash immediately with copious amounts of water and obtain medical attention.
First Aid - Skin  Wash accidental spillage from skin. Obtain medical attention if symptoms develop.
First Aid - Ingestion  Do not induce vomiting. Wash out mouth with water. Drink 1 or 2 glasses of water (or milk). If large amount swallowed or symptoms develop obtain medical attention.
First Aid - Inhalation  Remove from source of exposure. Keep warm and at rest. Obtain medical attention if symptoms develop.

5. FIRE FIGHTING MEASURES

Extinguishing Media  Not applicable. Inorganic powder or granules. Not combustible.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions  Wear appropriate protective clothing. Dust mask if conditions are dusty. See section 8 for advice on personal protection.
Environmental Precautions  Try to prevent the material from entering drains or water courses. Advise Authorities if spillage has entered water course or sewer or has contaminated soil or vegetation.
Spillages  Contain spillage and where possible damp with water spray to minimise dust. Sweep or preferably vacuum up and collect in suitable containers for recovery or disposal.
7. HANDLING AND STORAGE

Handling
Avoid creating a dust. See section 8 for advice on personal protection.
A considerable static electrical charge can be built up during mechanical handling which may become a hazard in atmospheres containing flammable vapours. Advice on the control of static is given in British Standard BS 5958.

Storage
Bags and containers should be kept closed and in a dry place.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Standards
1. Synthetic amorphous silica
   Silica amorphous, total inhalable dust: UK EH40: OES 6 mg/m³ 8h TWA.
   Silica amorphous, respirable dust: UK EH40: OES 2.4 mg/m³ 8h TWA.
   Silica gel: ACGIH: TLV 10 mg/m³ 8h TWA.
   Precipitated silica: ACGIH: TLV 10 mg/m³ 8h TWA.

2. Cobalt chloride
   Cobalt and compounds as Co: UK EH40: MEL 0.1 mg/m³ 8h TWA.
   Cobalt and compounds as Co: ACGIH: TLV 0.02 mg/m³ 8h TWA.

Engineering Control Measures
Engineering methods to prevent or control exposure are preferred. Methods include process or personnel enclosure, mechanical ventilation (dilution and local exhaust), and control of process conditions.

Respiratory Protection
Avoid inhalation of dust. Wear suitable respiratory protective equipment if working in confined spaces with inadequate ventilation or whenever there is any risk of the exposure limits being exceeded. Advice on respiratory protective equipment is given in the HSE (Health and Safety Executive) publication HS(G)53.

Hand Protection
Wear suitable gloves.

Eye Protection
Wear suitable eye protection.

Body Protection
Wear suitable overalls.

Protection During Application
Handle in well ventilated conditions in accordance with good industrial hygiene and safety practices.
No eating, drinking or smoking in the workplace.
Practice good personal hygiene.
In the USA, ASTM E1156-88 (reapproved 1993) specifies standard practice for handling amorphous silica.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State
Granules.

Colour
Blue.

Odour
Odourless.

pH
3 - 10 at 5% w/w in water.

Melting Point (°C)
>1000

Flash Point (PMCC) (°C)
Not applicable.

Explosion Limits (%)
Not applicable.

Solubility in Water (kg/m³)
Insoluble.
9. PHYSICAL AND CHEMICAL PROPERTIES (continued)

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto-flammability (deg C)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Dust Explosion Data</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Hygroscopic.</td>
</tr>
<tr>
<td>Conditions to Avoid</td>
<td>None known.</td>
</tr>
<tr>
<td>Materials to Avoid</td>
<td>None known.</td>
</tr>
<tr>
<td>Hazardous Decomposition Products</td>
<td>None known.</td>
</tr>
</tbody>
</table>

11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity</td>
<td>The lethal dose for humans for synthetic amorphous silica is estimated at over 15000 mg/kg. Oral LD50 (rat) values 766 mg/kg have been reported for cobalt chloride products. Synthetic amorphous silica has little adverse effect on lungs and does not produce significant disease or toxic effect when exposure is kept below the permitted limits. However existing medical conditions (eg asthma, bronchitis) may be aggravated by exposure to dust. Effects of dust may be greater, and occur at lower levels of exposure in smokers compared to non-smokers. Inhalation of cobalt has been associated with sensitisation (asthma) and other pulmonary disorders.</td>
</tr>
<tr>
<td>Health Effects - Inhalation</td>
<td>Dust may cause discomfort and mild irritation.</td>
</tr>
<tr>
<td>Eye contact</td>
<td>Dust may have a drying effect on the skin.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>Cobalt compounds are potent skin sensitisers.</td>
</tr>
<tr>
<td>Skin Sensitisation</td>
<td>IARC assessment: Amorphous silica is not classifiable as to its carcinogenicity to humans (Group 3). IARC assessment: There is limited evidence for the carcinogenicity of cobalt (ii) chloride in experimental animals.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td></td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecotoxicity</td>
<td>Synthetic amorphous silica is virtually inert and has no known adverse effect on the environment. Cobalt is a List II substance in the EEC Directive 76/464 for the control of dangerous substances into the aquatic environment.</td>
</tr>
</tbody>
</table>

13. DISPOSAL

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Disposal</td>
<td>Most sewage works impose strict limits on the discharge of cobalt. This material is classified as hazardous waste under EEC Directive 91/689/EEC. Dispose of in accordance with all applicable local and national regulations. This material is classified as a special waste under the UK Special Waste Regulations 1996.</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION
14. TRANSPORT INFORMATION (continued)

UN Class
This product is not classified as dangerous goods under the
United Nations Transport Recommendations.

UN Packaging Group
No special packaging requirements.

15. REGULATORY INFORMATION

EC Classification Carcinogen, Category 2
Labelling Information Toxic

R phrases
R49 May cause cancer by inhalation.
R42/43 May cause sensitisation by inhalation and skin
contact.
R52/53 Harmful to aquatic organisms, may cause long-term
adverse effects in the aquatic environment.

S phrases
S22 Do not breathe dust.
S53 Avoid exposure - obtain special instructions before use.
S45 In case of accident or if you feel unwell, seek medical
advice immediately (show the label where possible).
S61 Avoid release to the environment. Refer to special
instructions/Safety data sheets.
S60 This material and its container must be disposed of as
hazardous waste.

EINECS Listing Preparation - all components listed
TSCA Listing Mixture - all components listed
AICS Listing Mixture - all components listed
DSL/NDSL (Canadian) Listing Mixture - all components listed on DSL

16. OTHER INFORMATION

MSDS first issued 12 February 1999
MSDS data revised 7 March 2001
Revisions Highlighted Manufacturer/Supplier

The information provided in this Safety Data Sheet is correct
to the best of our knowledge at the date of publication. It is
intended as a guide for safe handling, storage and use in
known industrial applications, but it is not a specification or
guarantee of specific properties, and no liability can be
accepted for any loss, injury or damage resulting from its use.
Customer Care Notice

Change in Classification of Blue Silica Gel

Further to the EC directive 98/98/EC, from 1st June 2000 cobalt chloride will be classed as a category 2 carcinogen and as such products using cobalt chloride will have to be identified as a carcinogen and a hazard to the environment.

If you have units containing the blue indicator based silica gel, it is necessary for you to take appropriate measures with regard to the drying and disposal of this product.

**Drying** - When using a forced air drying unit, i.e. Hawke Breather Dryer Type 110v particles may be blown out from the breather, operatives should therefore be suitably protected.

**Disposal** - If the product should become damaged or needs to be disposed of, it should be treated as a special waste; any waste management provider will be able to undertake this function. Following is a suggested contact - *Lanstar Limited, Sue Wright, 0161 775 2644*.

*In normal operation there is no hazard, this product is acceptable to remain in service indefinitely, the potential hazard is only with regard to drying and disposal.*

However, effective from 3rd April 2000 all Hawke Breathers will be supplied with Sorbsil Chameleon C orange silica gel which is **not** classed as a carcinogen.

Any queries please contact Hawke Sales on +44 (0) 161 308 3611 or e-mail them on sales@ehawke.com