1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Identification
Product Name: Q-CEL® Inorganic Microspheres
Other Names: Hollow Microspheres
Company: Potters Ballotini Ltd trading as PQ Hollow Spheres
Use: Speciality engineering additive in plastics. E.g. it is added to modify the density, impact resistance, wear resistance, provide thermal or acoustic insulation

Customer Service/Emergency Contact
PQ Hollow Spheres
ASK House
Northgate Avenue
Bury St Edmunds IP32 6BB
Suffolk
United Kingdom
Tel: +44 (0) 1284 715406
Fax: +44 (0) 1284 715401
E-mail: pwolf@pottersgroup.com

2. HAZARDS IDENTIFICATION

Emergency Overview:
Fine, white powder with no odour. Not combustible. Dusts can cause physical irritation to eyes and respiratory system. May cause dry skin and mild irritation.

Dangerous Goods information: Not a Dangerous Good according to the ADG Code.

Hazardous Substances Information: Not a Hazardous Substance according to the Criteria of the Australian NOHSC.

Poison Schedule: Not a Scheduled Poison

Acute Health Effects:
- Swallowed: May cause slight irritation to mouth, throat, and stomach. Dusts can cause physical irritation to eyes. May cause redness and tearing.
- Eye: May cause dry skin and mild skin irritation.
- Skin: Dusts may cause respiratory irritation. May cause sneezing. May cause dryness of the mucous membranes.

Chronic Health Effects:
- All Routes: Prolonged or repeated skin contact may cause dry skin. Defatting of the skin can result in irritation and dermatitis (inflammation of the skin).

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Identify of Ingredients</th>
<th>CAS No</th>
<th>Prop’n</th>
<th>Risk Phrases as 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Borosilicate Powder</td>
<td>50815-87-7</td>
<td>&gt;99.5%</td>
<td>-</td>
</tr>
<tr>
<td>Siloxane, Methyl Hydrogen (bonded to spheres)</td>
<td>63148-57-2</td>
<td>&lt;0.5%</td>
<td>-</td>
</tr>
<tr>
<td>Moisture (loss on drying at 105°C)</td>
<td>7732-18-5</td>
<td>&lt;0.5%</td>
<td>-</td>
</tr>
<tr>
<td>Loss on Ignition at 900°C</td>
<td></td>
<td>3-7%</td>
<td>-</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

- Swallowed: Immediately rinse mouth with water. Repeat until product is thoroughly removed. Give water to drink. Get medical attention if effects develop or persist.
- Eye: Immediately rinse with plenty of cold water for at least 15 minutes.
- Skin: Wash contaminated skin with plenty of water. Get medical attention if irritation effects develop or persist.
- Inhaled: Remove victim to fresh air. Get medical attention of health effects develop or persist.

First-Aid Facilities: Safety shower and eye wash facilities nearby
Advice to Doctor: Treat symptomatically as for physical irritation
5. FIRE FIGHTING MEASURES

Fire or Explosion Hazard: Solid, non-combustible powder. Electrostatic discharges may occur when pumping/transfer/pouring the dry powder.

Extinguishing Media: Any extinguishing media suitable for the surrounding area.

Combustion Product Hazards: No significant hazardous combustion products. Fire conditions may release siloxane decomposition products and dust clouds containing the microspheres.

Special Protective Precautions & Equipment: Eye & Respiratory protection where dust clouds are formed. No other special precautions required.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures: Do not breathe dust. Avoid contact with skin & eyes.

Small spill cleanup: Vacuum, shovel, sweep or mop up. Avoid raising dust clouds.

Large spill cleanup: Keep unnecessary people away. Avoid walking through the spilled material. Vacuum, scoop or shovel up. Avoid raising dust clouds. Place spillages in clean labelled containers for reuse, recycling or disposal. See Section 13 for Disposal Considerations

Special Issues: Spilled material may be a slipping hazard.

7. HANDLING AND STORAGE

Safe Handling: Avoid contact with eyes, skin and clothing. Avoid breathing dusts. Keep container closed. Use only in well ventilated areas. Promptly clean up any spills or residues.

Safe Storage: Keep containers closed at all times. Store in original containers or in clean metal or plastic containers and keep dry.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National Exposure Standards: No exposure standards have been established for the borosilicate glass or siloxane surface coating ingredients in this product by NOHSC (Worksafe Australia).

<table>
<thead>
<tr>
<th>Substance: Nuisance Dust, Inspirable</th>
<th>TWA ppm</th>
<th>STEL ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppm mg/3</td>
<td>- 10</td>
<td>-</td>
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</table>

This standard is the manufacturers recommendation for good practice. All atmospheric contamination should be minimised.

If heated above 150°C, the Siloxane surface coating will start decomposing and release trace amounts of Formaldehyde vapour.

Formaldehyde: 1ppm 1.2mg/m³ TWA 2ppm 2.5mg/m³ STEL

Formaldehyde is a Carcinogen Category 2 – Probable Human Carcinogen

Design & Engineering: Use in well ventilated area. Avoid generating and inhaling dusts. When transferring the product consider the potential for electrostatic charge build up and the need to dissipate.

Personal Protective Equipment: Avoid skin & eye contact. Avoid inhaling the dust. Follow normal industrial safety practises. The use of protective clothing and equipment depends on the degree and nature of the exposure. The following personal protective equipment should be used:

1. Safety Glasses, goggles or faceshields as appropriate.
2. Plastic, Rubber, Leather or Cotton gloves as appropriate.
4. Overalls, splash apron or similar protective apparel.
5. Respiratory protection to AS1715-1716 when dust levels are present. Wash contaminated clothing and protective equipment before storing and reusing. The use of barrier cream is recommended to minimise the skin drying effects of this material.

Where applicable refer to the following Standards:
AS/NZS1337 Eye Protectors for industrial applications
9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odour: Fine, White Powder, no odour

Chemical Formula: \( \text{NA}_2\text{SiO}_2/\text{NaBO}_2 \) (fused ingredients general formulae)

Melting Point/Boiling Point: \( \text{MP}: >350^\circ\text{C} \), \( \text{BP}: \text{Not determined} \)

Decomposition Temperature: At \( >150^\circ\text{C} \) the Siloxane Coating starts to decompose.

Vapour Pressure: Not determined

Relative Vapour Density: Not applicable

Specific Gravity or Density: Not applicable (as the microsphere is hollow)

Bulk Density: 150 – 500 kg/m\(^3\) (with narrow ranges for each grade)

Solubility: Insoluble in water

pH: 7-9 (of a 5% slurry when left for several hours) (estimated)

Percent Volatile: >0.5%

Octanol/Water Partition: Not applicable (not soluble in either fraction)

Co-efficient Corrosiveness: No corrosive effects known

Flammable Properties: Non combustible solid

Flashpoint: Not applicable

Flammability Limited (FL) (%): Not applicable

Autoignition Temp: Not applicable

Particle Size: Mean: 30-125 micrometres (with a narrower range for each grade)

10. STABILITY AND REACTIVITY

Chemical Stability: Stable

Conditions to Avoid: Dust Cloud Formation

Incompatible Materials: None in particular. However, strong oxidising agents may react with the Siloxane coating. Strong bases may eventually dissolve the microspheres. Hydrochloric Acid solutions will dissolve these microspheres.

Unsuitable Container Materials: None in particular

Hazardous Decomposition Products: If overheated: The Siloxane coating with start decomposing above 150°C and release trace formaldehyde vapours that may build up in enclosed areas and cause irritation.

Hazardous Reactions: None known

11. TOXICOLOGICAL INFORMATION

Toxicity Data: Acute Oral Toxicity: LD50 (rat): >5000 mg/kg (estimated)

Eye Irritation: May cause physical eye irritation

Skin Irritation: May cause physical skin irritation

Oral Toxicity: When a similar product was tested for acute oral toxicity to rats at a dosage level of 500 mg/kg body weight, all animals survived and gained weight.

Respiratory Toxicity: When a similar product was tested for respiratory toxicity in a 6-month intratracheal study in rats, no mortalities, untowards reactions, or observations correlated with exposure to the product. Minimal multifocal inflammation of the lung occurred in 90% of males and 80% of females. No appreciable increase in fibrous tissue was present in these lesions.

Eye Irritation: Not an Eye irritant requiring labelling with R36. When similar materials were tested for acute eye irritation in rabbits they caused iritis grade 1, redness was observed grade 1-2, chemosis grade 2 was observed as well as fluorescein stain retention. Two Q-CEL Microsphere products were tested for eye irritation in the USA in 2000. Test.1 5mg placed into the conjunctival sac: No corneal opacity was noted in any observation period. Iritis of 1 noted in 1 of 3 eyes at 1 hour, cleared by 24 hours.
Conjunctival irritation scores of 2 (redness), 2 (chemosis), 2 (discharge) at 1 hour note in 3 eyes that had cleared by 24 hours.

Test 2: 5mg placed in to the conjunctival sac: No corneal opacity or iritis was noted in any observation period. Conjunctival irritation scores 1-2 (redness), 0-2 (chemosis), 0-2 (discharge) and 1 hour noted in 3 eyes that had cleared by 24 hours.

Human Experience:

20 years of experience handling the product in a manufacturing facility have not lead to any reported skin, eye or respiratory irritation effects.

Skin Irritation:

When a similar product was tested for skin irritation potential, it caused very slight erythema to abraded skin. Its primary skin irritation index was 0.04, and so was not considered to be a primary skin irritant.

Carcinogenic Effects: Not listed as A Carcinogen by the WHO IARC, USA, NTP or USA OSHA.

12. ECOLOGICAL INFORMATION

General: Avoid contaminating waterways. Insoluble in water. Will float on water due to its hollow nature. Not expected to be an environmental hazard, but may physically block systems.

Ecotoxicity Data: The Boron content in this borosilicate matrix is not able to be released into the environment in quantities that cause harm. Note: Boron is an essential element for growth of plants, but at higher levels, greater than 0.75mg/l, boron is toxic to some plants, particularly citrus crops.

Persistence & Degradability: This material is stable and does not readily degrade (dissolve). It is not expected to bioaccumulate.

Mobility: Will float on water. Expected to be immobile in soil.

13. DISPOSAL CONSIDERATIONS

Disposal Methods & Containers: Disposal to be in accordance with Local, State & Federal EPA waste regulations. Normally suitable for disposal at approved land waste.

Landfill, Incineration: May be landfilled. Not suitable for incineration.

14. TRANSPORTATION INFORMATION

Road & Rail: Not defined as a Dangerous Good: by the Australian Code for the Transport of Dangerous Goods by Road & Rail.

Sea: Not a Dangerous Good according to the International Maritime Dangerous Goods Code (IMDG Code).

Air: Not a Dangerous Good according to the International Air Transport Association (IATA) Dangerous Goods Regulations.

15. REGULATORY INFORMATION

Labelling: Not a Workplace Hazardous
Not a Scheduled Poison
Not a Dangerous Good

Packaging: Any type. However, consider the potential for electrostatic charge dissipation.

Australian Chemical Control Schemes

NICNAS–AICS: All ingredients are on the Australian Inventory of Chemical Substances.

Aust. Pesticides & Veterinary Medicine Authority: Ag & Vet Chemicals: Not applicable

Therapeutic Goods Administration: Medicines: Not applicable

Food Standards Australian & New Zealand: Food: Not applicable

Chemicals Weapons Act: Not applicable

Ozone Depleting Substance Act: Not applicable
<table>
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<tr>
<th>16. OTHER INFORMATION</th>
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<tr>
<td><strong>MSDS Dates &amp; Revisions</strong></td>
</tr>
<tr>
<td>MSDS Original Preparation Date: 10th November 2004 (Draft 2)</td>
</tr>
<tr>
<td>MSDS Latest Revision Date: 14th February 2005</td>
</tr>
<tr>
<td>Sections changed in last revision: -</td>
</tr>
<tr>
<td>MSDS Approved: 15th December 2004</td>
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</tbody>
</table>

**Acronyms used:**
- NOHSC: Australian National Occupational Health and Safety Commission
- WHS: Workplace Hazardous Substances
- CAS No: Chemical Abstracts Service Registry Number
- UN No: United Nations Dangerous Goods Number

**MSDS Code used:** This MSDS has been prepared according to the National Code of Practise for the preparation of Material Safety Data Sheets (NOHSC: 2011 (2003))

This MSDS summarises to the best of our knowledge the health and safety hazard information on the product and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace, including in conjunction with other products. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact this company.

This MSDS applies to all range of products marketed under Q-Cel® trademarks.