This SDS adheres to the standards and regulatory requirements of Great Britain and may not meet the regulatory requirements in other countries.

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

Product identifier

Product name : Virkon® S

Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Disinfectant

Details of the supplier of the safety data sheet

Company : Antec International Limited
Windham Road
Chilton Industrial Estate
Sudbury / Suffolk - CO10 2XD
United Kingdom

Telephone : +44(0)1787 377 305
Telefax : +44(0)1787 310 846
E-mail address : sds-support@che.dupont.com

Emergency telephone number

Emergency telephone number : +44-(0)8456-006.640

Remarks : Antec International Limited is a wholly owned subsidiary of Dupont (UK) Ltd.

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

Irritant

R38: Irritating to skin.

Irritant

R41: Risk of serious damage to eyes.

Dangerous for the environment

R52: Harmful to aquatic organisms.

Label elements

[Illustration of hazard symbols]

R38 : Irritating to skin.
R41 : Risk of serious damage to eyes.
R52 : Harmful to aquatic organisms.

### Sensitising components
Contains: Dipotassium peroxodisulphate / Contains/ May produce an allergic reaction.

| S 2 | Keep out of the reach of children. |
| S22 | Do not breathe dust. |
| S24/25 | Avoid contact with skin and eyes. |
| S26 | In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. |
| S36/37/39 | Wear suitable protective clothing, gloves and eye/face protection. |
| S60 | This material and its container must be disposed of as hazardous waste. |

### Other hazards
no data available

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substances</th>
<th>Mixtures</th>
</tr>
</thead>
</table>
| Pentapotassium bis(peroxymonosulphate) bis(sulphate) (CAS-No.70693-62-8) (EC-No.274-778-7) | **Classification according Directive 67/548/EEC**  
Xn;R22  
C;R34  
R52  
**Classification according Regulation 1272/2008 (CLP)**  
Acute Tox. 4; H302  
Skin Corr. 1B; H314  
**Concentration**  
40 - 50 % |
| Sodium C10-13-alkylbenzenesulfonate (CAS-No.68411-30-3) (EC-No.270-115-0) | **Classification according Directive 67/548/EEC**  
Xn;R22  
Xi;R38  
R41  
**Classification according Regulation 1272/2008 (CLP)**  
Acute Tox. 4; H302  
Skin Irrit. 2; H315  
Eye Dam. 1; H318  
**Concentration**  
10 - 12 % |
| Sulphamidic acid (CAS-No.5329-14-6) (EC-No.226-218-8) | **Classification according Directive 67/548/EEC**  
Xi;R36/38  
R52  
R53  
**Classification according Regulation 1272/2008 (CLP)**  
Eye Irrit. 2; H319  
Skin Irrit. 2; H315  
Aquatic Chronic 3; H412  
**Concentration**  
4 - 6 % |
| Malic acid (CAS-No.6915-15-7) (EC-No.230-022-8) | **Classification according Directive 67/548/EEC**  
Xn;R22  
Xi;R37/38  
R41  
**Classification according Regulation 1272/2008 (CLP)**  
Acute Tox. 4; H302  
Skin Irrit. 2; H315  
Eye Dam. 1; H318  
STOT SE 3; H335  
**Concentration**  
7 - 10 % |
4. FIRST AID MEASURES

Description of first aid measures

General advice : Never give anything by mouth to an unconscious person. When symptoms persist or in all cases of doubt seek medical advice.

Inhalation : Remove from exposure, lie down. If victim has stopped breathing: Artificial respiration and/or oxygen may be necessary. Consult a physician.

Skin contact : Wash off immediately with plenty of water. Consult a physician.

Eye contact : Remove contact lenses. Rinse immediately with plenty of water and seek medical advice.

Ingestion : Do NOT induce vomiting. If conscious, drink plenty of water. Call a physician immediately.

Most important symptoms and effects, both acute and delayed

no data available

Indication of any immediate medical attention and special treatment needed

no data available

5. FIREFIGHTING MEASURES

Extinguishing media
**Suitable extinguishing media**: Foam, Dry powder, Carbon dioxide (CO2)

**Special hazards arising from the substance or mixture**

**Specific hazards during firefighting**: Do not allow run-off from fire fighting to enter drains or water courses.

**Advice for firefighters**

**Special protective equipment for firefighters**: Wear self-contained breathing apparatus and protective suit.

**Further information**: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures**

**Personal precautions**: Evacuate personnel to safe areas. Use personal protective equipment.

**Environmental precautions**: Try to prevent the material from entering drains or water courses.

**Methods and materials for containment and cleaning up**

**Methods for cleaning up**: Sweep up and shovel into suitable containers for disposal. Avoid dust formation. After cleaning, flush away traces with water.

**Other information**: Dispose of in accordance with local regulations.

### 7. HANDLING AND STORAGE

**Precautions for safe handling**

**Advice on safe handling**: Avoid dust formation in confined areas. For personal protection see section 8. Avoid contact with skin and eyes.

**Conditions for safe storage, including any incompatibilities**

**Requirements for storage areas and containers**: Protect from contamination. Store in original container. Keep in a dry, cool place.

**Advice on common storage**: Keep away from: Combustible material

**Other data**: Stable under recommended storage conditions.

**Specific end use(s)**

no data available
### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Control parameters

If sub-section is empty then no values are applicable.

#### Components with workplace control parameters

<table>
<thead>
<tr>
<th>Type of Exposure</th>
<th>Form of Exposure</th>
<th>Control Parameters</th>
<th>Update</th>
<th>Basis</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust (inhaling and respirable fraction)</td>
<td>TWA Inhalable dust.</td>
<td>10 mg/m³</td>
<td>2007</td>
<td>EH40 WEL</td>
<td></td>
</tr>
<tr>
<td>TWA Respirable dust.</td>
<td>4 mg/m³</td>
<td>2007</td>
<td>EH40 WEL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Derived No Effect Level**

- Pentapotassium bis(peroxymonosulphate) bis(sulphate):
  - Type of Application (Use): Workers
  - Exposure routes: Skin contact
  - Health Effect: Acute - systemic effects
  - Value: 80 mg/kg

- **Type of Application (Use): Workers**
  - Exposure routes: Inhalation
  - Health Effect: Acute - systemic effects
  - Value: 50 mg/m³

- **Type of Application (Use): Workers**
  - Exposure routes: Skin contact
  - Health Effect: Acute - local effects
  - Value: 0.449 mg/cm²

- **Type of Application (Use): Workers**
  - Exposure routes: Inhalation
  - Health Effect: Acute - local effects
  - Value: 50 mg/m³

- **Type of Application (Use): Workers**
  - Exposure routes: Skin contact
  - Health Effect: Long-term - systemic effects
  - Value: 20 mg/kg

- **Type of Application (Use): Workers**
  - Exposure routes: Inhalation
  - Health Effect: Long-term - systemic effects
  - Value: 0.28 mg/m³
**Type of Application (Use): Consumers**
- **Exposure routes:** Skin contact
  - **Health Effect:** Acute - systemic effects
  - **Value:** 40 mg/kg

- **Exposure routes:** Inhalation
  - **Health Effect:** Acute - systemic effects
  - **Value:** 25 mg/m³

- **Exposure routes:** Ingestion
  - **Health Effect:** Acute - systemic effects
  - **Value:** 10 mg/kg

- **Exposure routes:** Skin contact
  - **Health Effect:** Acute - local effects
  - **Value:** 0.224 mg/cm²

- **Exposure routes:** Inhalation
  - **Health Effect:** Acute - local effects
  - **Value:** 25 mg/m³

- **Exposure routes:** Skin contact
  - **Health Effect:** Long-term - systemic effects
  - **Value:** 10 mg/kg

- **Exposure routes:** Inhalation
  - **Health Effect:** Long-term - systemic effects
  - **Value:** 0.14 mg/m³

- **Exposure routes:** Ingestion
  - **Health Effect:** Long-term - systemic effects
  - **Value:** 10 mg/m³

- **Exposure routes:** Inhalation
  - **Health Effect:** Long-term - local effects
  - **Value:** 0.14 mg/m³

**Predicted No Effect Concentration**

- **Pentapotassium bis(peroxymonosulphate) bis(sulphate)**
  - **Value:** 0.022 mg/l
    - **Compartment:** Fresh water
  - **Value:** 0.002 mg/l
    - **Compartment:** Marine water
  - **Value:** 0.0109 mg/l
    - **Compartment:** Intermittent use/release
Exposure controls

Engineering measures: Provide local exhaust ventilation when handling material in bulk.

Eye protection: Tightly fitting safety goggles

Hand protection: Rubber gloves

Skin and body protection: Wear as appropriate: Apron Boots Remove and wash contaminated clothing before re-use.

Hygiene measures: Wash hands before breaks and immediately after handling the product. Regular cleaning of equipment, work area and clothing.

Respiratory protection: When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form: powder

Colour: pink

Odour: pleasant, sweet

pH: 2.4 - 2.7

Flash point: does not flash

Relative density: 1.07

Water solubility: 65 g/l at 20 °C

Other information
10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: Stable under normal conditions.

Possibility of hazardous reactions: No dangerous reaction known under conditions of normal use.

Conditions to avoid: Exposure to moisture.

Incompatible materials:
- Strong bases
- Combustible material
- Halide containing salts

Hazardous decomposition products:
- Chlorine
- Sulfur dioxide

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute oral toxicity

LD50 / rat : 4,123 mg/kg
Method: OECD Test Guideline 401

- Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  LD50 / rat : 500 mg/kg

- Polyphosphoric acids, sodium salts
  LD50 / rat : 3,053 mg/kg

- Sodium chloride
  LD50 / rat : 3,550 mg/kg

Acute inhalation toxicity

LC50 / 4 h rat : 3.7 mg/l
Method: aerosol

- Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  LC50 / 4 h rat : > 5 mg/l

- Sodium chloride
  LC50 / 4 h rat : > 10.5 mg/l

Acute dermal toxicity

LD50 / rabbit : 2,200 mg/kg
• Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  LD50 / rat : > 2,000 mg/kg

• Sodium chloride
  LD50 / rabbit : > 10,000 mg/kg

Skin irritation

Result: Mild skin irritation
Method: OECD Test Guideline 404
Moderate skin irritation

• Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  rabbit
  Classification: Causes burns.
  Result: Corrosive

• Polyphosphoric acids, sodium salts
  animals (unspecified species)
  Classification: Not classified as irritant
  Result: slight irritation

• Sodium chloride
  rabbit
  Classification: Not classified as irritant
  Result: No skin irritation

Eye irritation

Risk of serious damage to eyes.

• Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  rabbit
  Classification: Corrosive
  Result: Risk of serious damage to eyes.

• Sodium chloride
  rabbit
  Classification: Not classified as irritant
  Result: slight irritation

Sensitisation

guinea pig Buehler Test
Classification: Did not cause sensitization on laboratory animals.
Result: Animal test did not cause sensitization by skin contact.

guinea pig Maximisation Test
Classification: Did not cause sensitization on laboratory animals.
Result: Animal test did not cause sensitization by skin contact.

• Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  guinea pig
Classification: Not a skin sensitiser.
Result: Did not cause sensitization on laboratory animals.
There are rare or inconclusive reports of human skin sensitization. There are no reports of human respiratory sensitization.

- Sodium chloride
  mouse
  Classification: Not a skin sensitiser.
  Result: Did not cause sensitization on laboratory animals.

Repeated dose toxicity

- Polyphosphoric acids, sodium salts
  No adverse effect has been observed in chronic toxicity tests.

- Sodium toluenesulfonate
  Oral rat
  No toxicologically significant effects were found.

- Sodium chloride
  Oral rat
  Due to its physical properties, there is no potential for adverse effects.

Mutagenicity assessment

- Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  Animal testing did not show any mutagenic effects.

- Sodium C10-13-alkylbenzenesulfonate
  Animal testing did not show any mutagenic effects.

- Malic acid
  Animal testing did not show any mutagenic effects.

- Polyphosphoric acids, sodium salts
  Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

- Sodium toluenesulfonate
  Animal testing did not show any mutagenic effects.

- Sodium chloride
  Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

- Dipotassium peroxodisulphate
  Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Carcinogenicity assessment

- Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  No data available

- Sodium C10-13-alkylbenzenesulfonate
  Did not show carcinogenic effects in animal experiments.
Malic acid
   Not classifiable as a human carcinogen.

Polyphosphoric acids, sodium salts
   Animal testing did not show any carcinogenic effects.

Sodium toluenesulfonate
   Animal testing did not show any carcinogenic effects. Information given is based on data obtained from similar substances.
   Not classifiable as a human carcinogen.

Sodium chloride
   Animal testing did not show any carcinogenic effects.

Dipotassium peroxodisulphate
   no data available

Toxicity to reproduction assessment

No toxicity to reproduction

Pentapotassium bis(peroxymonosulphate) bis(sulphate)
   no data available

Sodium C10-13-alkylbenzenesulfonate
   No toxicity to reproduction

Malic acid
   No toxicity to reproduction

Polyphosphoric acids, sodium salts
   No toxicity to reproduction

Sodium toluenesulfonate
   no data available

Sodium chloride
   No toxicity to reproduction

Dipotassium peroxodisulphate
   no data available

Assessment teratogenicity

Polyphosphoric acids, sodium salts
   Animal testing showed no developmental toxicity.

Sodium chloride
   No toxicity to reproduction

Dipotassium peroxodisulphate
   no data available
12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish

- Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  LC50 / 96 h / Cyprinodon variegatus (sheepshead minnow): 1.09 mg/l

- Sodium chloride
  LC50 / 96 h / Lepomis macrochirus (Bluegill sunfish): 5,840 mg/l
  LC50 / 96 h / Carassius auratus (goldfish): 7,341 mg/l
  LC50 / 96 h / Pimephales promelas (fathead minnow): 10,610 mg/l

Toxicity to aquatic plants

- Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  ErC50 / 72 h / Algae: > 1 mg/l

- Sodium chloride
  IC50 / 96 h / Lemna minor (duckweed): 6,870 mg/l

Toxicity to aquatic invertebrates

- Pentapotassium bis(peroxymonosulphate) bis(sulphate)
  EC50 / 48 h / Daphnia: 3.5 mg/l

- Sodium chloride
  EC50 / 48 h / Daphnia magna (Water flea): 874 mg/l

Chronic toxicity to fish

- Sodium chloride
  NOEC / 7 d / Pimephales promelas (fathead minnow): 4,000 mg/l
  NOEC / 33 d / Pimephales promelas (fathead minnow): 252 mg/l

Chronic toxicity to aquatic Invertebrates

- Sodium chloride
  NOEC / 21 d / Daphnia magna (Water flea): 314 mg/l
  NOEC / 7 d / Ceriodaphnia Dubia (water flea): 354 mg/l

Persistence and degradability

Biodegradability

Expected to be biodegradable

Bioaccumulative potential

no data available
Mobility in soil
no data available

Results of PBT and vPvB assessment
no data available

Other adverse effects
no data available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Product : Dispose of as special waste in compliance with local and national regulations. The product should not be allowed to enter drains, water courses or the soil.

Contaminated packaging : If recycling is not practicable, dispose of in compliance with local regulations.

14. TRANSPORT INFORMATION

Further information : Not classified as dangerous in the meaning of transport regulations.

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

no data available

Chemical Safety Assessment

no data available

16. OTHER INFORMATION

Text of R-phrases mentioned in Section 3

R 8 Contact with combustible material may cause fire.
R22 Harmful if swallowed.
R34 Causes burns.
R36/37/38 Irritating to eyes, respiratory system and skin.
R36/38 Irritating to eyes and skin.
R37/38 Irritating to respiratory system and skin.
R38 Irritating to skin.
R41 Risk of serious damage to eyes.
R42/43 May cause sensitization by inhalation and skin contact.
R52 Harmful to aquatic organisms.
R53 May cause long-term adverse effects in the aquatic environment.

Full text of H-Statements referred to under section 3.
<table>
<thead>
<tr>
<th>H272</th>
<th>May intensify fire; oxidiser.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H302</td>
<td>Harmful if swallowed.</td>
</tr>
<tr>
<td>H314</td>
<td>Causes severe skin burns and eye damage.</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation.</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage.</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>H334</td>
<td>May cause allergy or asthma symptoms or breathing difficulties if inhaled.</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation.</td>
</tr>
<tr>
<td>H412</td>
<td>Harmful to aquatic life with long lasting effects.</td>
</tr>
</tbody>
</table>

Other information

Significant change from previous version is denoted with a double bar.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The above information relates only to the specific material(s) designated herein and may not be valid for such material(s) used in combination with any other materials or in any process or if the material is altered or processed, unless specified in the text.