Octamethylcyclotetrasiloxane (D4)

This document is a high-level summary intended to provide the general public with an overview of product safety for this substance. It is not intended to replace the Safety Data Sheet or legally required safety information, which is available from Dow Corning and should be referred to for full details of recommended safety procedures for each type of use. Where there is any inconsistency in the information provided herein and the Safety Data Sheet/legally required information, the latter shall prevail.

1. Substance Name and Chemical Identity

- **Chemical Name:** Octamethylcyclotetrasiloxane (D4)
- **CAS Number:** 556-67-2
- **Molecular formula:** C₈H₂₄O₄Si₄
- **Common name:** D4

2. Uses and Applications

D4 is a cyclic organic silicon substance that has the following uses:

- Use as a monomer ('building block') in the production of silicone polymers. Silicone polymers may be oils, greases, rubbers and resins and have a wide-range of uses.
- Use as an intermediate (starting material) in the production of other organosilicon substances.
- Use in non-metal surface treatment.
- Use in electronics applications.
- Use in textiles applications.
- Use in personal care products.
- Use in household care products.
- Use as a laboratory chemical in research and development activities.

The majority of these applications take place in industrial settings; however, personal care and household care products containing D4 may be used by professionals and consumers.

In personal care products D4 is used as a base fluid or solvent for other larger molecules. It is ideal for this use due to being odourless, easy to spread, tasteless, non-greasy and non-stinging. D4 may be used in a wide variety of products including antiperspirants, deodorants, skin creams, lotions, bath oils, suntan and shaving products, make-up and nail polishes.

In household care products, much like personal care products, D4 is used as a base fluid or solvent for other larger molecules. Typically, it is used in products such as washing and cleaning products, solid and spray polishes, wax blends, and in automotive aesthetic products.
3. Physical/chemical properties

D4 is a liquid at room temperature and atmospheric pressure, with a melting point of 17.7°C, and a boiling point of 175°C. D4 is a moderately volatile, flammable, high-boiling liquid which is poorly soluble in water. The substance is classified for flammability under the Globally Harmonised System (GHS) as:

| Flammable Liquid Category 3 | H226: Flammable liquid and vapour |

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>Colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>Odourless</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>296.61 g/mol</td>
</tr>
<tr>
<td>Melting/boiling point</td>
<td>17.7°C/175°C</td>
</tr>
<tr>
<td>Density</td>
<td>0.95 g/cm³ at 25°C</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>132 Pa at 25°C</td>
</tr>
<tr>
<td>Flammability</td>
<td>Yes</td>
</tr>
<tr>
<td>Flash point</td>
<td>51 to 61 °C</td>
</tr>
<tr>
<td>Self-ignition temperature</td>
<td>384 to 387°C at 101.3 kPa</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not explosive</td>
</tr>
</tbody>
</table>

4. Health information

D4 is classified for reproductive toxicity under the Globally Harmonised System (GHS) as:

| Reproductive Category 2         | H361: Suspected of damaging fertility or the unborn child |

5. Environmental information

D4 is classified for hazards to the aquatic environment under the Globally Harmonised System (GHS) as:

| Aquatic Chronic Category 4      | H413: May cause long lasting harmful effects to aquatic life | No pictogram required |

Full quantitative risk assessment has been carried out which concludes that no risk to environment is present if the substance is used under the conditions specified in the extended Data Safety Sheet.
6. Exposure potential

**Consumer exposure:** Consumers may come into contact with D4 whilst using personal care or household products containing the substance.

D4 concentrations in household care products range from less than 0.1% to up to 50%, although the majority are in the range of 1 – 5%.

In personal care products, low levels of D4 may be present as an impurity (up to 1 – 2%) in products containing silicone polymers. D4 may also be present as a base fluid in formulated personal care products at less than 10% by weight.

**Workplace exposure:** This refers to potential for worker exposure at manufacturing sites or industrial workplaces. Exposure of personnel in facilities that manufacture D4 is considered low, as processes are highly controlled and automated and strict containment measures at sites producing D4 are in place. Exposure of workers at other locations, such as formulation sites, is also minimised by appropriate measures as set out in the Safety Data Sheet.

For professional use of products containing D4, such as washing and cleaning products and polishes and waxes, no special handling measures are required. Laboratory applications of the substance involve the use of very small quantities of the material and all procedures are to be carried out in a fume cupboard.

**Environmental releases:** Consumer and professional uses of personal care products containing D4 result in 100% loss of the substance to the environment. The majority of this loss (90%) is to air, where the substance will degrade; the remainder is lost to waste water.

Manufacturing occurs under controlled conditions, with only very small releases to air and waste water. Releases to the environment from other industrial locations, such as formulation sites, are limited by use of appropriate measures as set out in the Safety Data Sheet.

7. Risk management recommendations

**Consumer and professional risk management:** Consumer and professional uses of personal care products containing D4 result in 100% loss of the substance to the environment. The majority of this loss (90%) is to air, where the substance will degrade; the remainder is lost to waste water.

Manufacturing occurs under controlled conditions, with only very small releases to air and waste water. Releases to the environment from other industrial locations, such as formulation sites, are limited by use of appropriate measures as set out in the Safety Data Sheet.

**Industrial risk management:** For more detailed information please refer to the extended safety data sheet for information on protecting workers and limiting environmental exposure at industrial sites. In summary, when using this chemical, there must be adequate ventilation. Suitable respiratory protection must be worn if the product is handled in large quantities in confined spaces, chemical-resistant clothing and gloves, and safety glasses or other suitable eye protection must be worn. Avoid sources of ignition and keep containers tightly closed, in a dry and cool place.

8. Conclusions

The manufacturing and use of D4 does not pose a risk to humans or the environment if instructions in the Safety Data Sheet are followed.

9. Contact Information

For further information on this substance or product safety summaries in general, please contact:

Dow Corning EH&S Team