Product Safety Assessment

SunSpheres™ SPF Booster

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Names

- SunSpheres™ SPF booster
- SunSpheres LCG polymer
- RohmSphere™ SPF booster
- SunSpheres PGL polymer
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Product Overview

- SunSpheres™ SPF boosters are styrene/acrylic copolymer liquid solutions or powders manufactured by Rohm and Haas, a wholly owned subsidiary of The Dow Chemical Company. For further details, see Product Description.
- SunSpheres SPF boosters are added to sunscreen formulations and daily-wear SPF products to increase the effective sun protection value (SPF) and UVA absorbance of these products. The technology involved in SunSpheres polymers has become the key formulating tool in creating higher SPF sunscreen products (SPF >15). For further details, see Product Uses.
- Occupational exposure is possible during the manufacture of these polymers, as well as during sunscreen formulation or manufacture. Consumers may use products containing these sun-protection boosters. For further details, see Exposure Potential.
- SunSpheres SPF boosters are nonirritating, nontoxic, and nonphotosensitizing to the skin. In the manufacturing setting, inhalation of vapors, mist, or dusts may irritate the nose, throat, and lungs. Prolonged inhalation may cause headache or nausea. Skin or eye contact with dusts or vapor during manufacturing may cause irritation. For further details, see Health Information.
- SunSpheres SPF boosters are expected to slowly degrade in the environment. They are unlikely to accumulate in the food chain, and are practically non-toxic to aquatic organisms on an acute basis. For further details, see Environmental Information.
- SunSpheres SPF boosters are stable under recommended storage conditions. Exposure to temperatures well above recommended processing temperatures can cause these polymers to decompose. Thermal decomposition may yield acrylic monomers. For further details, see Physical Hazard Information.

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Manufacture of Product

- **Capacity** – Rohm and Haas, a wholly owned subsidiary of The Dow Chemical Company, produces SunSpheres™ SPF boosters in quantities sufficient to meet market demand at facilities in the Croydon, Pennsylvania, U.S.
- **Process** – SunSpheres SPF boosters are manufactured using proprietary technology.

Product Description

SunSpheres™ SPF boosters are styrene/acrylic copolymers. They are inert, hollow spheres that scatter sunlight. When added to a sunscreen formulation, they increase the sun protection value (SPF) of the active sunscreen ingredient by as much as 75%. SunSpheres SPF boosters are marketed in powder form or as a liquid emulsion (26–28% solids in water).

Product Uses

SunSpheres™ SPF boosters are added to sunscreen formulations and daily-wear SPF products to increase the effective sun protection value (SPF) and UVA absorbance of these products. SunSpheres SPF boosters can be used in a wide range of sun-care and daily-wear SPF products containing UV-active ingredients. Some examples are:

- UVA/UVB sunscreens and water-resistant sunscreens
- Makeup creams and lotions
- Hand and face creams and lotions
- Alpha-hydroxy acid products
- Medicated and moisturizing creams
- Leave-on cosmetics

Exposure Potential

SunSpheres™ SPF boosters are used in the production of consumer sunscreens and cosmetics. Based on the uses for these products, the public could be exposed through:

- **Workplace exposure** – Exposure can occur in polymer manufacturing facilities or facilities that use these polymers to make other products. Avoid breathing process fumes. Monomer vapors can be released when the material is heated during processing operations. Where vapor, mist, or dusts may occur, wear a properly fitted NIOSH-approved half-mask, air-purifying respirator. To reduce the potential for dust explosions, maintain good housekeeping and electrically bond and ground equipment. Each facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit unnecessary exposure. See Health Information.

- **Consumer exposure to products containing SunSpheres SPF boosters** – SunSpheres SPF boosters are not sold directly to consumers, but they will be present in some sunscreens or cosmetics used by the public. Always read the product information before use and follow the label/use instructions. See Health Information.

- **Environmental releases** – SunSpheres SPF boosters will be slowly released to the environment during use of consumer products containing them. Small amounts may be released to sewers and enter wastewater treatment plants. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, contain the material if possible. Spilled polymer may cause a slipping hazard.

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Evacuate personnel upwind of spill/leak. For spills of SunSpheres™ powder, remove all sources of ignition and use water spray to keep dusting to a minimum. Transfer spilled material to suitable containers for recovery or disposal. Keep spills and cleaning runoff out of municipal sewers and open bodies of water. Use appropriate safety equipment. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Prevent any unnecessary entry into the area. SunSpheres liquid products are not combustible. Dusts from SunSpheres powder formulation at sufficient concentrations can form explosive mixtures with air. Use a water spray, carbon-dioxide extinguisher, or dry-chemical extinguisher to fight fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, request the relevant Safety Data Sheet from Rohm and Haas.

**Health Information**¹⁹,²⁰,²¹

SunSpheres™ SPF booster is safe to use in personal-care formulations. It has been shown to be nonirritating, nontoxic, and nonphotosensitizing.

**Eye contact** – Monomer vapors or dusts generated during processing may cause slight eye irritation.

**Skin contact** – Prolonged or repeated skin contact during manufacturing can cause slight skin irritation.

**Inhalation** – In the manufacturing setting, inhalation of vapors, mist, or dusts may irritate the nose, throat, and lungs. Prolonged inhalation may cause headache or nausea.

**Ingestion** – Based on compositionally similar materials, SunSpheres LCG polymer is expected to be nontoxic by single oral exposure.

For more information, review the relevant Safety Data Sheet at Rohm and Haas.

**Environmental Information**²²,²³,²⁴

SunSpheres™ SPF boosters are nonvolatile (do not evaporate), inert, and do not dissolve in water. If introduced into the environment, these polymers are expected to remain in soil or float in water. Although the polymers are essentially non-biodegradable, they are expected to slowly degrade in the environment, including degradation by physical action or by exposure to sunlight.

SunSpheres SPF boosters are not likely to accumulate in the food chain (bioconcentration potential is low) and are nontoxic to fish and other aquatic organisms.

For more information, request the relevant Safety Data Sheet from Rohm and Haas.

**Physical Hazard Information**²⁵,²⁶

SunSpheres™ SPF boosters are stable under recommended storage conditions. Exposure to temperatures well above recommended processing temperatures (greater than 177°C/350°F) can cause these polymers to decompose. Thermal decomposition may yield acrylic monomers. For

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SunSpheres™ powder, avoid ignition sources and electrically ground and bond all handling equipment. Prevent SunSpheres products from freezing as product stability may be affected.

Spilled material can create slippery conditions.

For more information, request the relevant Safety Data Sheet from Rohm and Haas.

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**Regulatory Information**

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of SunSpheres™ SPF boosters. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, or by contacting the Dow Customer Information Group.

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**Additional Information**

- Contact Us ([www.dow.com/assistance/dowcig.htm](http://www.dow.com/assistance/dowcig.htm))

For more business information about SunSpheres™ SPF boosters, visit Dow’s Household Goods and Personal Care web site.

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**References**

7. SunSpheres Hollow Sphere Technology: SPF Boosters for More Aesthetically-Pleasing Formulations, Rohm and Haas Personal Care, Form PC0172005_Global, August 2008, pages 2, 11, and 12.

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8 SunSpheres™ LCG Polymer Safety Data Sheet, Rohm and Haas Company, November 14, 2007, pages 1–2 and 4.
9 SunSpheres Powder Safety Data Sheet, Rohm and Haas Company, November 15, 2007, pages 1–2 and 5.
10 SunSpheres LCG Polymer Safety Data Sheet, Rohm and Haas Company, November 14, 2007, page 5.
14 SunSpheres Hollow Sphere Technology: SPF Boosters for More Aesthetically-Pleasing Formulations, Rohm and Haas Personal Care, Form PC0172005_Global, August 2008, pages 2, 4, and 11.
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17 SunSpheres LCG Polymer Safety Data Sheet, Rohm and Haas Company, November 14, 2007, pages 2–3 and 5.
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20 SunSpheres Powder Safety Data Sheet, Rohm and Haas Company, November 15, 2007, pages 1, 2, and 5.
21 SunSpheres Hollow Sphere Technology: SPF Boosters for More Aesthetically-Pleasing Formulations, Rohm and Haas Personal Care, Form PC0172005_Global, August 2008, pages 2 and 11–12.
22 SunSpheres LCG Polymer Safety Data Sheet, Rohm and Haas Company, November 14, 2007, page 5.
24 SunSpheres Hollow Sphere Technology: SPF Boosters for More Aesthetically-Pleasing Formulations, Rohm and Haas Personal Care, Form PC0172005_Global, August 2008, page 11.

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