Product Safety Assessment

ACULYN™ 44 and 46 Rheology Modifiers

Product Safety Assessment documents are available at www.dow.com/productsafety/finder/.

Select a Topic:
Names
Product Overview
Manufacture of Product
Product Description
Product Uses
Exposure Potential
Health Information
Environmental Information
Physical Hazard Information
Regulatory Information
Additional Information
References

Names
Trade Name
• ACULYN™ 44 polymer
• ACULYN 46 polymer
• ACULYN 46N polymer

INCI Name
• PEG-150/decyl alcohol/SMDI copolymer
• PEG-150/stearyl alcohol/SMDI copolymer

Product Overview

• ACULYN™ 44 and 46 rheology modifiers are water-based polymer formulations designed for personal-care applications. A "rheology modifier" enhances the flow characteristics of a liquid. ACULYN 44 and 46 rheology modifiers are nonionic associative thickeners. They work together with hydrophobic surfactants, pigments, particulates, and dyes. These products are formulated as colorless or milky-white liquids. For further details, see Product Description.

• ACULYN 44 and 46 rheology modifiers are added to personal-care formulations to improve product stability and flow quality. These polymers impart a soft, nongreasy, nonsticky feel to personal-care products. Applications include facial creams and lotions, shampoos and conditioners, sunscreens, and anti-perspirants. For further details, see Product Uses.

• Worker exposure to ACULYN rheology modifiers is possible during manufacture, transport, or use. Consumers may use personal-care products that contain these polymers. For further details, see Exposure Potential.

• The polymers in ACULYN 44 and 46 rheology modifiers have a well-established toxicological profile and are safe for normal use. In the industrial setting, eye or skin contact with undiluted product may cause slight irritation. Inhalation of product vapor or mist during processing may cause irritation of the nose, throat, and lungs. For further details, see Health Information.

• ACULYN 44 and 46 rheology modifiers are polymer resins suspended in water. If released to the environment, the polymers would be expected to be inert. Due to their high molecular weight, these polymers are not expected to accumulate in the food chain and have no known ecotoxicological effects on fish or other aquatic organisms. For further details, see Environmental Information.

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• ACULYN 44 and 46 rheology modifiers are stable under recommended storage and use conditions. Avoid contact with strong oxidizing agents. For further details, see Physical Hazard Information.

Back to top

Manufacture of Product
• **Locations** – Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, manufactures ACULYN™ rheology modifiers at facilities in Bristol, Pennsylvania, USA in quantities sufficient to meet global demand.
• **Process** – ACULYN 44 and 46 rheology modifiers are produced and formulated in batch operations from stearyl alcohol, a diisocyanate, and a polyethylene glycol using proprietary technology. The general structure of ACUYN 44 and 46 polymers is shown below.

![Chemical structure](image)

Back to top

Product Description²,³
ACULYN™ 44 and 46 rheology modifiers are thickening agents designed for use in water-based personal-care products. These products are nonionic “associative” thickeners based on hydrophobically modified ethoxylated urethane (HEUR). Associative thickeners work together with hydrophobic surfactants, pigments, particulates, and dyes. ACULYN 44 and 46 rheology modifiers are formulated as dispersions of polymer in water. These formulations contain 20 to 40% solids and may contain additives such as propylene glycol: a moisturizer and humectant.

Back to top

Product Uses⁴,²,³
ACULYN™ 44 and 46 rheology modifiers are globally approved for use in personal-care formulations. ACULYN 44 and 46 rheology modifiers improve product stability and flow quality in the following types of personal-care products:
• **Hair care** – shampoos, conditioners, hair bleaches and dyes, permanent wave formulations
• **Skin care** – lotions and creams, moisturizers
• **Sunscreens**
• **Facial creams and cosmetics**
• **Acne-treatment products** – benzoyl peroxide lotions
• **Anti-aging facial creams** – alpha-hydroxy acid creams

Back to top

Exposure Potential¹,⁵
ACULYN™ 44 and 46 rheology modifiers are used in the production of personal-care products. Based on this, exposure could occur through:
• **Workplace exposure** – Those working with ACULYN rheology modifiers in manufacturing and/or formulating operations could be exposed during maintenance, sampling, testing, or other procedures. Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit exposure. See Health Information.
• **Consumer exposure to ACULYN™ 44 and 46 rheology modifiers** – These polymers are not sold for direct consumer use, but they are formulated at low levels into personal-care products, such as hair- and skin-care items, used by the general public. The polymers in ACULYN™ 44 and 46 rheology modifiers have a well-established toxicological profile and are safe for normal use. Always read and follow product label instructions. See Health Information.

• **Environmental releases** – Because these polymers are formulated into personal-care products, small quantities could enter wastewater-treatment facilities when consumer products are washed off or discarded. If released to water the polymer component would initially disperse in water, and eventually settle into the sediment. These polymers will degrade slowly in the environment and will likely be removed by biological wastewater-treatment facilities by adsorbing onto sludge. These polymers are not acutely toxic to fish or other aquatic organisms. See Environmental, Health, and Physical Hazard Information.

• **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the focus is on immediate containment to prevent contamination of soil and surface or ground water. Evacuate personnel upwind and away of spill or leak. Wear appropriate protective equipment when handling spills of these products. Dike the spill and absorb with inert solids such as sand or soil. Collect liquids and solid diking material in suitable separate containers. Spilled material can create slippery conditions. See Environmental, Health, and Physical Hazard Information.

• **In case of fire** – Isolate the fire and deny unnecessary entry. ACULYN™ 44 rheology modifier is combustible. ACULYN™ 46 rheology modifier will not burn until all water has evaporated. Use extinguishing measures appropriate for the surrounding fire. Alcohol-containing foam, carbon-dioxide or dry-chemical extinguishers, or a fine water spray is suitable for fighting fires of ACULYN™ 44 rheology modifier. Firefighters should wear positive-pressure, self-contained breathing apparatus and protective firefighting clothing. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

### Health Information

ACULYN™ 44 and 46 polymers are safe and appropriate for use in a broad range of rinse-off and leave-on personal-care applications.

**Eye contact** – Direct contact with undiluted product can cause slight irritation.

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

**Inhalation** – Inhalation of product vapor or mist during processing can cause irritation of the nose, throat, and lungs. Headache and nausea are also possible.

For more information, see the relevant Safety Data Sheet.

### Environmental Information

The polymers in ACULYN™ 44 and 46 rheology modifiers would be expected to be inert in the environment. If released to surface waters, polymer would initially remain dispersed in water and eventually settle into the sediment. These polymers will likely be removed by biological wastewater-treatment facilities by adsorbing onto sludge biosolids. Although polymers are

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generally considered non-biodegradable, they are likely to degrade slowly in the environment, including degradation by physical action or upon exposure to sunlight.

Because of their high molecular weight, these polymers would not be expected to accumulate in the food chain (low bioconcentration potential). ACULYN™ 44 and 46 polymers are nontoxic to fish and other aquatic organisms on an acute basis.

Propylene glycol, a component of ACULYN 44 formulation, is readily biodegradable, has a low tendency to accumulate in the food chain (low bioconcentration potential), and is nontoxic to fish and toxic to aquatic invertebrates on an acute basis.

For more information, see the relevant Safety Data Sheet.

Back to top

Physical Hazard Information

ACULYN 44 and 46 rheology modifiers are stable under recommended storage and use conditions. Avoid contact with strong oxidizing agents. Keep these products from freezing.

Vapors can be evolved when products are heated during processing operations.

For more information, see the relevant Safety Data Sheet.

Back to top

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of ACULYN™ 44 and 46 rheology modifiers. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Technical Data Sheet, or Contact Us.

Back to top

Additional Information

- Contact Us (www.dow.com/assistance/thoughts.htm)

For more business information about ACULYN rheology modifiers, visit the Dow ACULYN for Personal Care webpage at www.dow.com/products/product_line_detail.page?product-line=1000056&display-mode=highlight&region=&start-index=0&all-results=

Back to top
References

1. ACULYN™ 44 Polymer Material Safety Data Sheet, Rohm and Haas Company
2. ACULYN 44 Rheology Modifier/Stabilizer: An Excellent Thickener for Inorganic Sunscreen Formulations Brochure, Rohm and Haas Company, Form No. PC0122002A_EUR
3. ACULYN 46 Rheology Modifier/Stabilizer: An Efficient Shear Thinning Thickener Compatible with Cations, Brochure, Rohm and Haas Company, Form No. PC0132002A_EUR
4. ACULYN for Personal Care webpage (www.dow.com/products/product_line_detail.page?product-line=1000056&display-mode=highlight&region=&start-index=0&all-results)
5. ACULYN 46 [Polymer] Material Safety Data Sheet, Rohm and Haas Company
NOTICES:

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