Technical Data Sheet

ACULYN™ 2051 Rheology Modifier

Thickening and emulsifying polymer in dimethicone

INCI NAME: Sodium Polyacrylate (and) Dimethicone (and) Cyclopentasiloxane (and) Trideceth-6 (and) PEG/PPG 18/18 Dimethicone

Features & Benefits

- Multifunctional product: thickening and emulsifying
- Ready to use for controlling the rheology of aqueous formulations
- Silicone carrier provides instant perception of improved aesthetics
- Ease of formulation/cold processing
- Gives smooth, non-greasy and non-sticky formulations
- Freeze/thaw stable

Applications

Can be used in a wide range of personal care applications:

- Skin care
- Sun care
- Color cosmetics
- Leave-in hair conditioners
- Hair styling products

Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

Property	Unit	Result
Appearance		Viscous, opaque liquid; white to light yellow
Viscosity at 25°C, 1% in water, (Brookfield RVT, 20 rpm)	cP	15,000 to 30,000
Viscosity at 25°C, (Brookfield LVT, 30 rpm)	cP	1,500 to 4,000
Flashpoint	°C	> 100
pH, 1% in water		5.5 to 6.5
Shelf life at or below 30°C (86°F), in unopened containers		18 months
Freeze/thaw stability at -30°C (-22°F)		Three cycles

Description

ACULYN™ 2051 Rheology Modifier is an inverse (water-in-oil) emulsion of sodium polyacrylate in dimethicone. The emulsion contains two surfactants, one to stabilize the thickening agent and one that helps bring the polymer into contact with the aqueous phase of the formulation.

When the product is added to water, the polymer expands into the water phase to thicken and give stability to the preparation. As the formulation thickens, the oil phase ingredients are emulsified and stabilized.

How To Use

ACULYN 2051 Rheology Modifier should be mixed before use. Oil-in-water emulsions can be prepared by adding ACULYN 2051 Rheology Modifier to the oil phase and then mixing with the water phase. The oil phase containing ACULYN 2051 Rheology Modifier can be added to the water phase, or the water phase can be added to the oil phase. If the water phase is added to the oil phase, the emulsion inverts as the water phase is added, and this can reduce the particle size of the final emulsion. Alternatively, ACULYN 2051 Rheology Modifier can be added after the oil phase and water phase have been combined. Regardless of which technique is used, the mixer speed should be increased as the formulation thickens to maintain good mixing.

The effective pH range of 5.5 to 11 (Figure 1) allows the use of ACULYN 2051 Rheology Modifier in a variety of personal care formulations. The recommended addition level is 2 to 6%.

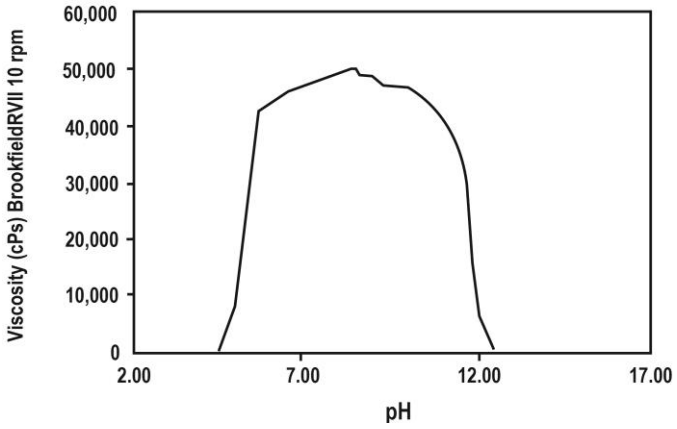

Figure 1: Viscosity of an Aqueous Gel Containing 5% Thickening Agent Versus pH.

How To Use (Cont.)

ACULYN 2051 Rheology Modifier can emulsify and stabilize silicone and organic oil phases. The level of oil that can be emulsified depends on the level of the thickening agent (Figure 2), which will determine final viscosity and stability. For example, the thickening agent can typically emulsify from 20% to 50% oil, depending on its type. It can be used with high solvent content (30% ethanol, isopropyl alcohol or acetone, 50% glycerin or propylene glycol). Thickening efficiency is reduced in the presence of electrolytes (Figure 3).

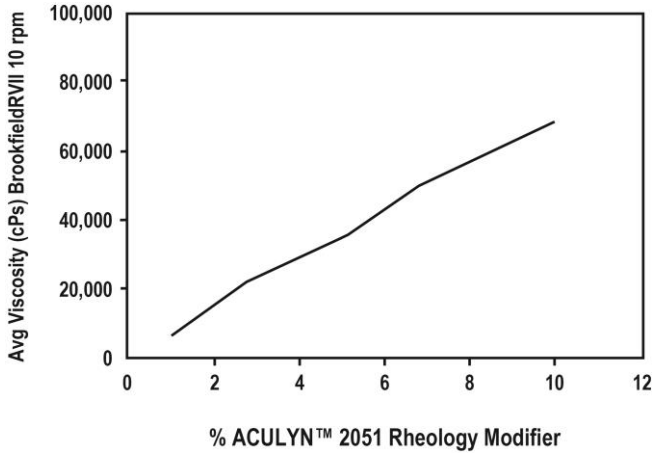

Figure 2: Average Viscosity of an Aqueous Gel Versus Thickening Agent Content.

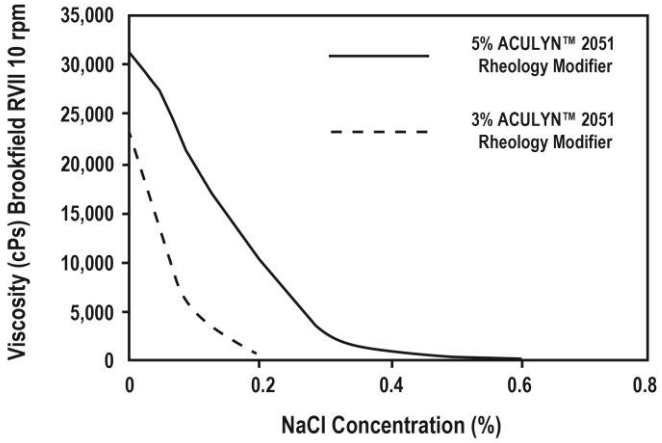

Figure 3: Viscosity of an Aqueous Gel Containing 5% Thickening Agent Versus Sodium Chloride Concentration.

The material has a noticeable shear-thinning effect. Its higher viscosity at low shear translates to maximum emulsion stability, while viscosity drop with shear allows the product to be easily dispensed and spread onto the skin or hair (Figure 4).

How To Use (Cont.)

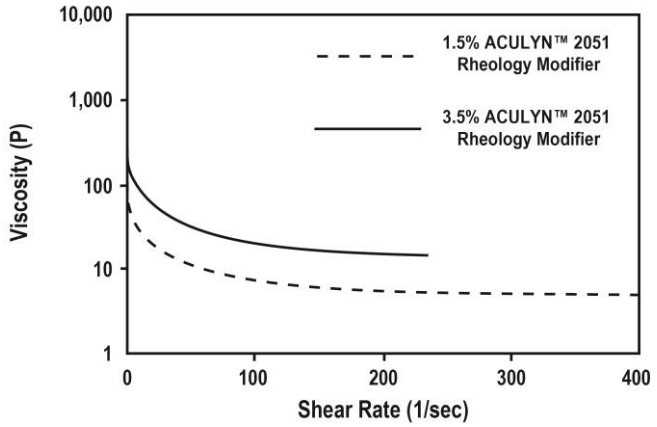

Figure 4: Rheological Profile Based on Two Levels of Thickening Agent.

Handling Precautions

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT WWW.CONSUMER.DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

Usable Life And Storage

When stored at or below 30°C (86°F) in the original unopened containers, this product has a usable life of 18 months from the date of production. It demonstrates freeze/thaw stability over three cycles at -30°C (-22°F).

Packaging Information

This product is available in 25 kg pails and 130 kg drums.

Samples are available in 500 g bottles.

Limitations

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

Health And Environmental Information

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, www.consumer.dow.com or consult your local Dow representative.

http://www.consumer.dow.com

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