

## ANTIL® HS 60

Hydrophilic emollient and thickening agent for shampoos, shower and bath preparations

- skin smoothing properties
- improves skin feel
- very good thickening properties
- provides shear thinning rheology for improved distribution and quick foaming
- low temperature dependence of the thickening effect
- foam stabilizing properties
- cold processable in every step of production
- free of polyethylene glycol and alkanolamides
- preservative-free

Personal Care

## INCI name (CTFA name)

Cocamidopropyl Betaine; Glyceryl Laurate

### Chemical and physical properties (not part of specifications)

Form	viscous liquid, thixotropic
Content Glyceryl Laurate	approx. 20 %
Content Cocamidopropyl Betaine	approx. 30 %
Appearance	turbid

### Properties

ANTIL® HS 60 combines the properties of a thickener, superfatting agent and secondary surfactant in one product. *Cocamidopropyl Betaine* and *Glycerol Monolaurate* are combined in a liquid, easy to handle raw material for superior and mild shampoos, shower baths and other kind of body cleansing preparations.

*Cocamidopropyl Betaine* is a well documented secondary surfactant for toiletries and essential additive for hair shampoos, shower and foam baths. It

- improves the physiological compatibility of anionic surfactants,
- supports skin and hair conditioning,
- simplifies the thickening of surfactant formulations, and
- provides excellent foam properties.

*Glycerol Monolaurate* is a compound of the natural skin lipids and is well known as a very pleasant refatting agent. The trend to natural products increases the interest in this additive. In comparison with homologues having longer alkyl chains, the lauric acid ester shows good solubility in aqueous systems and no negative influence on foam behaviour.

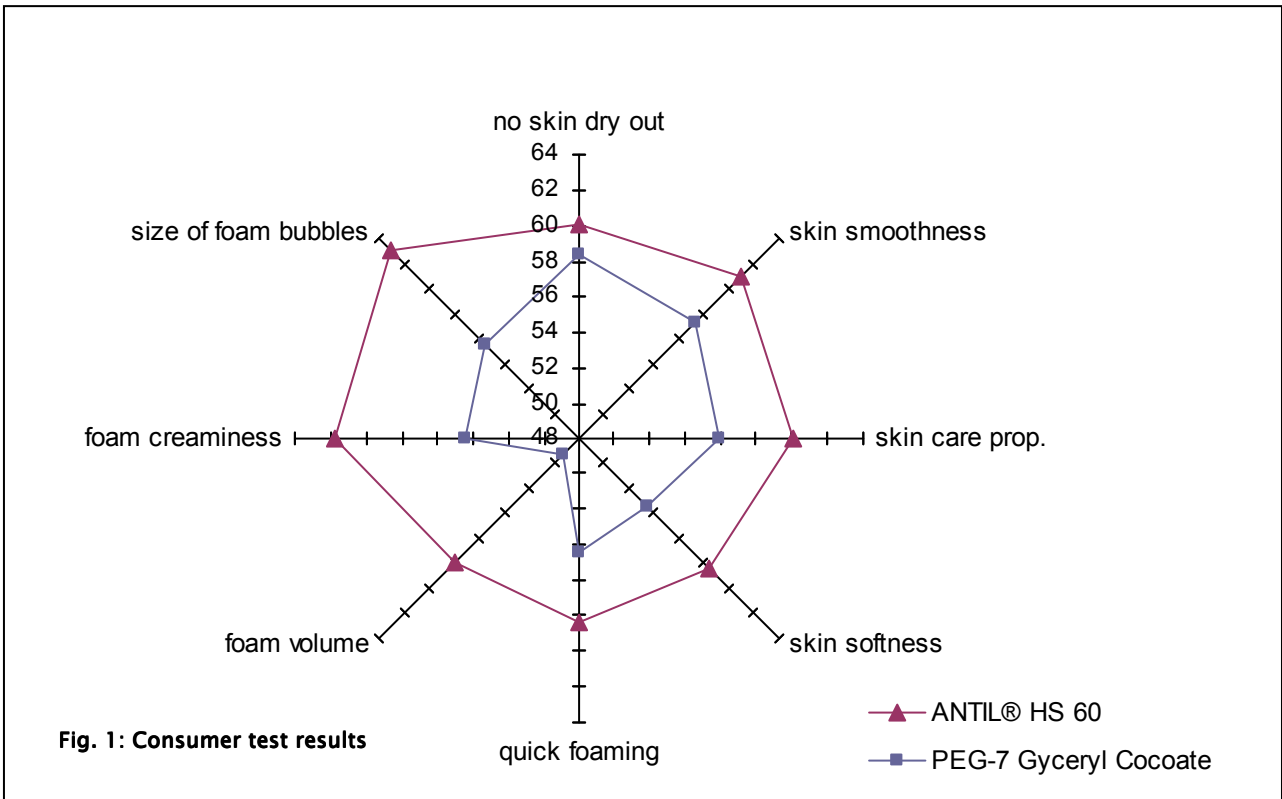
As a solid, *Glycerol Monolaurate* cannot be processed cold. With ANTIL® HS 60, *Glycerol Monolaurate* becomes cold processable.

ANTIL® HS 60 is

- clearly soluble,
- cold processable in every step of the production,
- free of polyethylene glycol and alkanolamines, and
- preservative-free.

### Consumer Test

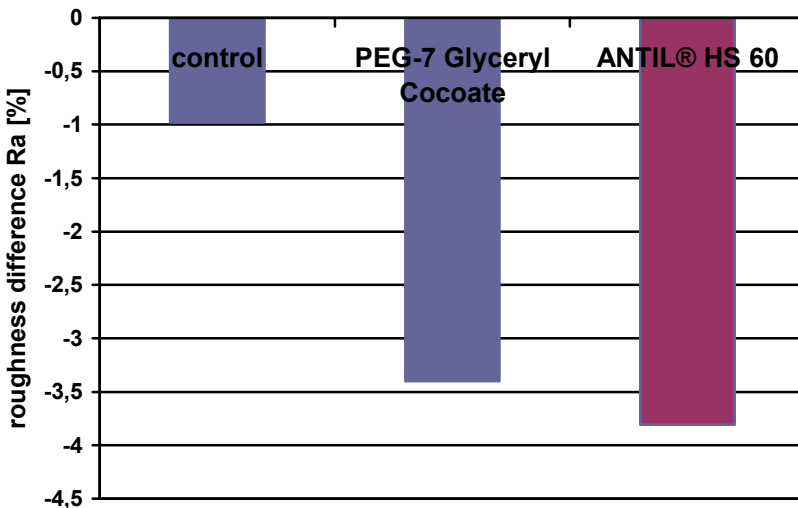
ANTIL® HS 60 improves the foam quality and has excellent skin conditioning properties. In a consumer test, ANTIL® HS 60 achieved superior ratings in comparison to PEG-7 Glyceryl Cocoate for skin care and foam properties. The tested shower gels were based on the surfactants SLES/CAPB (9 % / 3 % active). The included skin conditioning agents to compare were ANTIL® HS 60 (0.5 % active Glyceryl Laurate) and 2.0 % PEG-7 Glyceryl Cocoate. A panel of 84 persons used the shower gels 5 times and filled out a questionnaire. The results are shown in Figure 1 as judgement numbers. The formulation including ANTIL® HS 60 scores significantly better in all parameters.



**Skin smoothing properties**

ANTIL® HS 60 outperforms PEG-7 Glyceryl Cocoate regarding the skin smoothness. Using the FOITS method (Fast optical in vivo topometry of human skin, Institute Dr. Schrader, Germany), the skin surface was measured before and after a 3-time-

treatment with 4 % active diluted in SLES. For comparison, a field was washed only with water (control). The results in Figure 2 show that ANTIL® HS 60 provides a stronger reduction of skin roughness than PEG-7 Glyceryl Cocoate.



**Fig. 2: Measurement of the skin roughness (FOITS)**

**Rheology**

ANTIL® HS 60 provides a pleasant shear thinning rheology (meaning, the viscosity decreases with the shear rate).

This is an advantage over polymeric thickeners, which are based on high ethoxylated fat derivatives (e.g. PEG-150 Distearate). These types of thickeners provide Newtonian flow behaviour, where the viscosity is independent of the shear rate.

The rheological properties of these thickeners are perceived as gel like and solid structure. Figure 3 shows the comparison of the flow behaviours. The viscosity of a formulation with ANTIL® HS 60 decreases with increasing shear rate. Formulations thickened in this method are flowable, feel softer, foam faster and are easily distributed and diluted on the skin and hair.

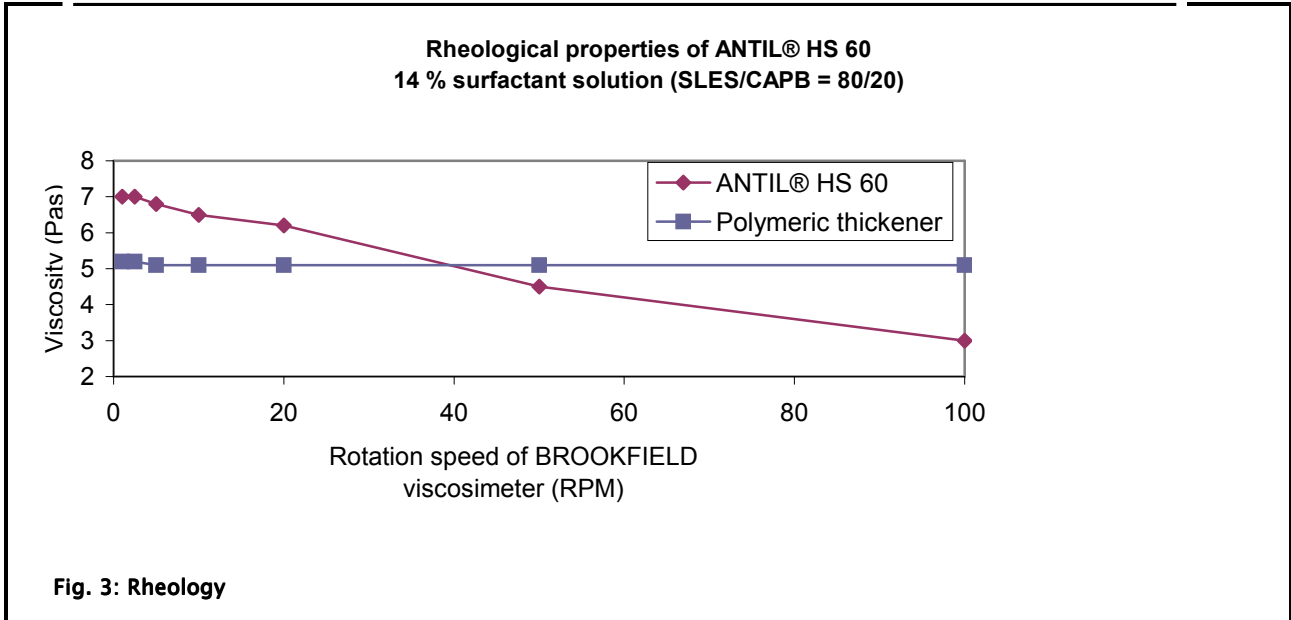


Fig. 3: Rheology

**Temperature dependence of the viscosity**

At elevated temperatures the thickening effect of ANTIL® HS 60 is more stable than that of polymeric thickeners.

This is especially important for formulations which contain pearlizing agents or other dispersed ingredients as they often separate at elevated temperatures.

Figure 4 shows a comparison of the different thickening agent's viscosities with temperature as a variable.

The polymeric thickener provides very high viscosity at 10 °C and very low at 40 °C. With ANTIL® HS 60 the viscosity remains nearly the same over the whole temperature range.

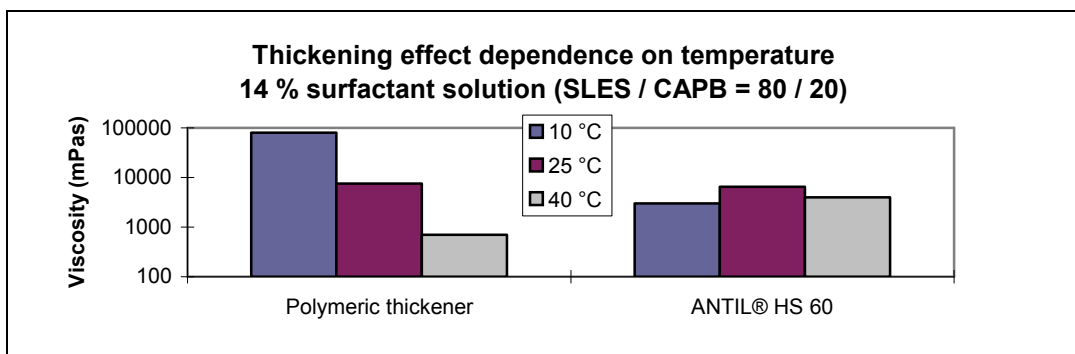


Fig. 4: Temperature dependence of the viscosity

### **Application**

By formulating with ANTIL® HS 60, the active content of the other surfactants in the formula can be reduced (e.g. by 1.5 % when using 5 % ANTIL® HS 60).

ANTIL® HS 60 can be used as a thickening agent with good skin conditioning properties – or as an emollient with good thickening properties – in formulations such as shampoos and body washes. Due to its flow behaviour, pumping is easier and no strings are formed making it is especially suitable to thicken liquid soaps for dispenser packs.

### **Processing**

ANTIL® HS 60 can be dispersed in water by slight stirring, requiring no additional mechanical energy (self-dispersing).

ANTIL® HS 60 is easily soluble in surfactant solutions. Clear formulations are obtained in combination with other surfactants (e.g. anionic and/or amphoteric).

ANTIL® HS 60 can be added during every step of production.

### **Packaging**

720 kg pallet (4 x 180 kg drum)

### **Storage**

ANTIL® HS 60 tends to crystallize partially below 15 °C. In the event crystals form, heat to 35 °C and homogenize.

### **Hazardous goods classification**

Information concerning

- classification and labelling according to regulations for transport and for dangerous substances,
- protective measures for storage and handling,
- measures in accidents and fires,
- toxicity and ecological effects

is given in our material safety data sheets.

## Guide Line Formulations

<b>Moisturizing Body Wash BK 209/2</b>	
<b>Phase A</b>	
Water	17.6 %
TEGOCEL® fluid HPM 4000	0.7 %
<b>Phase B</b>	
Sodium Laureth Sulfate (28 %)	38.0 %
TEGOSOFT® PC 31 (Polyglycerin-3 Caprate)	0.3 %
REWOTERIC® AM C (Sodium Cocoamphoacetate)	25.0 %
REWOPOL® SB CS 50 B (Disodium PEG-5 Laurylcitrate Sulfosuccinate; Sodium Laureth Sulfate)	4.0 %
ANTIL® HS 60 (Cocamidopropyl Betaine; Glyceryl Laurate)	2.0 %
Glycerin	3.0 %
<b>Phase C</b>	
Myristic Acid	5.3 %
TEGOSOFT® TN (C12-15 Alkyl Benzoate)	1.8 %
Sunflower (Helianthus Annuus) Oil	1.8 %
Lactic Acid, 80 %	0.5 %
<b>Preparation:</b> Disperse the TEGOCEL® fluid HPM 4000 in the water. Prepare phases A and B separately. Add A to B while stirring. Heat phases A/B to 65 °C and mix C into A/B. Cool down while stirring gently. Adjust pH to approximately 6.	

<b>Mild Hair &amp; Body Shampoo, PEG- and sulfate-free, Ecocert conform AK 98/11</b>	
Plantacare 1200 UP (Lauryl Glucoside, Cognis)	11.7 %
Plantacare 2000 (Decyl Cocoate, Cognis)	5.3 %
Water	61.0 %
TEGOSOFT® LSE 65 K Soft (Sucrose Cocoate)	2.0 %
TEGO® Betain F 50 (Cocamidopropyl Betaine)	18.0 %
ANTIL® HS 60 (Cocamidopropyl Betaine; Glyceryl Laurate)	2.0 %
Preservative, Perfume	q.s.
<b>Preparation:</b> Heat the Plantacare 1200 UP to 40 °C. Add the other ingredients in the given order and mix homogeneously.	

<b>Pearlized Liquid Soap UK 28/8/1</b>	
Sodium Laureth Sulfate (28 %)	40.0 %
TEGOSOFT® LSE 65 K Soft (Sucrose Cocoate)	3.0 %
Perfume	0.3 %
Water	44.8 %
TEGO® Betain F 50 (Cocamidopropyl Betaine)	6.4 %
TEGO® Pearl N 100 (Glycol Distearate; Steareth-4)	3.0 %
ANTIL® HS 60 (Cocamidopropyl Betaine; Glyceryl Laurate)	2.5 %
Preservative	q.s.
<b>Preparation:</b> Mix the ingredients in the given order.	

<b>Shower Bath - PEG-free FM 11124</b>	
REWOTERIC® AM C (Sodium Cocoamphoacetate)	15.0 %
REWOPOL® SB F 12 P (Disodium Lauryl Sulfosuccinate)	3.8 %
Water	61.7 %
TEGOSOFT® LSE 65 K Soft (Sucrose Cocoate)	2.5 %
ANTIL® HS 60 (Cocamidopropyl Betaine; Glyceryl Laurate)	4.0 %
TEGO® Betain F 50 (Cocamidopropyl Betaine)	13.0 %
<b>Preparation:</b> Mix the ingredients in the given order. Adjust the pH value with Citric Acid to 5.5. Finally add preservatives as required.	

<b>Creamy Anti-Dandruff Shampoo UK 73/3</b>	
<b>Phase A</b>	
TEGIN® G 1100 Pellets (Glycol Distearate)	3.0 %
Sodium Laureth Sulfate (28 %)	40.0 %
<b>Phase B</b>	
Perfume	0.3 %
Zinc-Pyrion NF (48%) (Zinc Pyrithione, WeylChem)	2.0 %
ABIL® B 88183 (PEG/PPG-20/6 Dimethicone)	0.5 %
<b>Phase C</b>	
Water	40.3 %
TEGO® Carbomer 141 (Carbomer)	0.2 %
NaOH, 25%	~ 0.1 %
<b>Phase C</b>	
TEGO® Betain F 50 (Cocamidopropyl Betaine)	10.0 %
ANTIL® HS 60 (Cocamidopropyl Betaine; Glyceryl Laurate)	3.7 %
<b>Preparation:</b>	
<b>A:</b> Heat the ingredients to approximately 65°C until the TEGIN® G 1100 is melted. Cool down while stirring to approximately 45°C.	
<b>B:</b> Add the ingredients in the given order to phase A.	
<b>C:</b> Dissolve the TEGO® Carbomer in the water. Neutralize the solution with NaOH. Add C to phase A+B.	
<b>D:</b> Add the ingredients in the given order.	

<b>PEG-free Conditioning Shampoo for long hair UM 289/8/3</b>	
Water	60.2 %
Polyquaternium-10 (Polymer JR 400, Amerchol)	0.3 %
TEGOSOFT® PC 41 (Polyglyceryl-4 Caprate)	2.0 %
Ammonium Lauryl Sulfate (34 %)	20.0 %
Perfume	0.5 %
ABIL® Quat 3272 (Quaternium-80)	0.5 %
TEGO® Betain F 50 (Cocamidopropyl Betaine)	10.0 %
ANTIL® HS 60 (Cocamidopropyl Betaine; Glyceryl Laurate)	3.5 %
TEGO® Pearl S 33 (Sodium C 14-16 Olefin Sulfonate; Glycol Distearate; Cocoamidopropyl Betaine; Sorbitan Laurate)	3.0 %
Preservative, NaCl	q.s.
<b>Preparation:</b>	
Add the Polymer JR 400 to the water and stir until it is totally swollen. Then add the other ingredients in the given order.	

H 05/08

This information and all further technical advice are based on Evonik Goldschmidt GmbH's present knowledge and experience. However, Evonik Goldschmidt GmbH assumes no liability for providing such information and advice including the extent to which such information and advice may relate to existing third party intellectual property rights, especially patent rights. In particular, Evonik Goldschmidt GmbH disclaims all CONDITIONS AND WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. EVONIK GOLDSCHMIDT GMBH SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INDIRECT OR INCIDENTAL DAMAGES (INCLUDING LOSS OF PROFITS) OF ANY KIND. Evonik Goldschmidt GmbH reserves the right to make any changes according to technological progress or further developments. It is the customer's responsibility and obligation to carefully inspect and test any incoming goods. Performance of the product(s) described herein should be verified by testing and carried out only by qualified experts. It is the sole responsibility of the customer to carry out and arrange for any such testing. Reference to trade names used by other companies is neither a recommendation, nor an endorsement of any product and does not imply that similar products could not be used. (Status: February, 2008)