

# APG®

## For Personal Care Applications

December 2009

Product Line Europe				
Product properties	Plantacare® 1200 UP	Plantacare® 818 UP	Plantacare® 2000 UP	Plantacare® 810 UP
INCI	Lauryl Glucoside	Coco-Glucoside	Decyl Glucoside	Caprylyl/Capryl Glucoside
Appearance	Cloudy, viscous, aqueous solution	Cloudy, viscous, aqueous solution	Cloudy, viscous, aqueous solution	Yellowish, slightly cloudy and viscous liquid
Active substance [%]	50 – 53	51 – 53	51 – 55	62 – 65
Water content [%]	47 – 50	47 – 49	45 – 49	35 – 38
Viscosity [mPas]	2,000 – 4,000 [40 °C]	2,500 – 6,000 [20 °C]	1,000 – 6,000 [20 °C]	500 – 1,500 [40 °C]
pH value [20% in 15% isopropanol]	11.5 – 12.5 [non-preserved]	11.5 – 12.5 [non-preserved]	11.5 – 12.5 [non-preserved]	11.5 – 12.5 [non-preserved]
Storage temperature	> 38°C < 45°C	> 15°C < 40°C	> 10°C < 40°C	< 40 °C
Main application	Liquid soap, shower gel, shampoo, toothpaste	Liquid soap, shower gel, foam bath, shampoo	Shampoo, shower gel, facial cleanser	Shampoo, shower gel, mouthwash

# APG®

## Product Line for Personal Care

 **BASF**  
The Chemical Company

Product Line Americas			
Product properties	Plantaren® 1200 N UP	Plantacare® 818 UP	Plantaren® 2000 N UP
INCI	Lauryl Glucoside	Coco-Glucoside	Decyl Glucoside
Appearance	Hazy pale yellow, viscous liquid	Cloudy, viscous, aqueous solution	Hazy pale yellow liquid
Active substance [%]	48 – 52	51 – 53	48 – 52
Water content [%]	48 – 52	47 – 49	48 – 52
Viscosity	18,000 – 20,000 [cps]	2,500 – 6,000 [mPas] [20 °C]	600 – 1,000 [cps]
pH value [20% in 15% isopropanol]	11.5 – 12.5 [non-preserved]	11.5 – 12.5 [non-preserved]	11.5 – 12.5 [non-preserved]
Storage temperature	> 35°C < 45°C	> 15°C < 40°C	> 10°C < 40°C
Main application	Liquid soap, shower gel, shampoo, toothpaste, bubble bath	Liquid soap, shower gel, foam bath, shampoo	Shampoo, shower gel, face cleanser

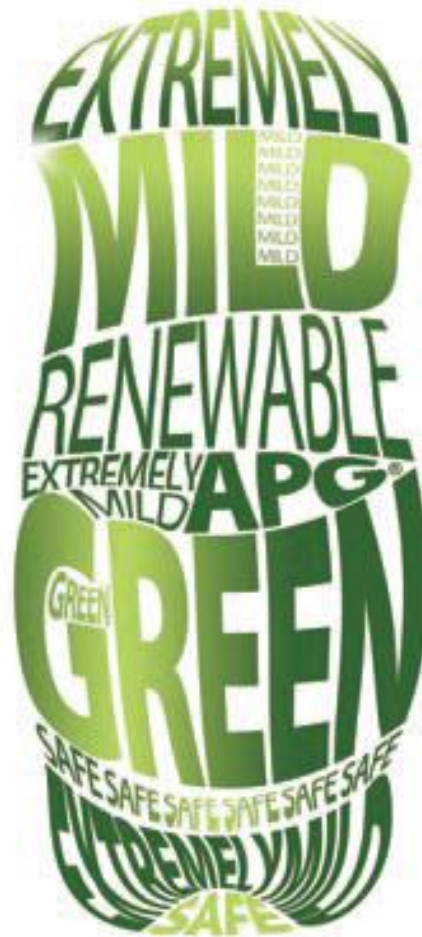
# APG®

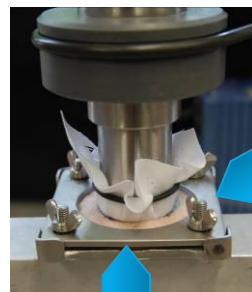
## Product Line for Personal Care

 **BASF**  
The Chemical Company

Product Line Asia Pacific				
Product properties	Plantacare® 1200 UP	Plantacare® 818 UP	Plantacare® 2000 UP	Plantacare® 810 UP
INCI	Lauryl Glucoside	Coco-Glucoside	Decyl Glucoside	Caprylyl/Capryl Glucoside
Appearance	Cloudy, viscous, aqueous solution	Cloudy, viscous, aqueous solution	Cloudy, viscous, aqueous solution	Yellowish, slightly cloudy and viscous liquid
Active substance [%]	50 – 53	51 – 53	51 – 55	62 – 65
Water content [%]	47 – 50	47 – 49	45 – 49	35 – 38
Viscosity [mPas]	2,000 – 4,000 [40 °C]	2,500 – 6,000 [20 °C]	1,000 – 6,000 [20 °C]	500 – 1,500 [40 °C]
pH value [20% in 15% isopropanol]	11.5 – 12.5 [non-preserved]	11.5 – 12.5 [non-preserved]	11.5 – 12.5 [non-preserved]	11.5 – 12.5 [non-preserved]
Storage temperature	> 38°C < 45°C	> 15°C < 40°C	> 10°C < 40°C	< 40 °C
Main application	Liquid soap, shower gel, shampoo, toothpaste	Liquid soap, shower gel, foam bath, shampoo	Shampoo, shower gel, facial cleanser	Shampoo, shower gel, mouthwash

# APG® for Body Wash





Textile with surfactant solution to cleanse the skin

Porcine skin  
Treated with soil  
(artificial sebum,  
beeswax, charcoal)



Rotating cylinder

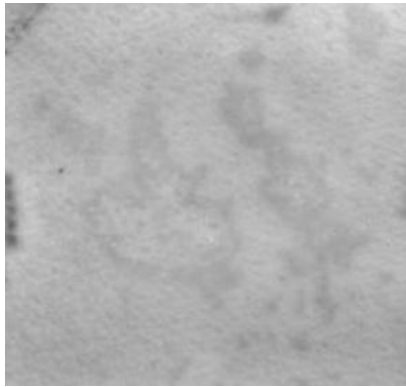


- Method to determine the skin cleansing efficacy of surfactants was established using porcine skin
- Use of a soil consisting of artificial sebum according to Bey, beeswax, and charcoal
- Detection by image analysis
- Comparison of the cleansing efficacy using solutions of sodium laureth sulfate and Plantacare® 1200 (both 12% active)
- Viscosity of the sodium laureth sulfate solution was adjusted to exclude viscosity effects

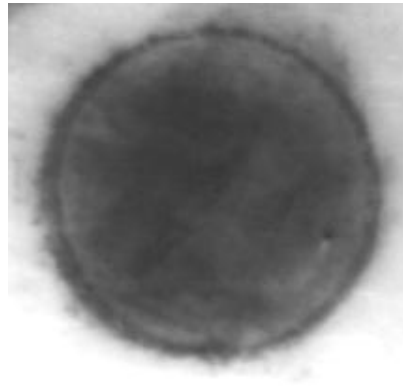
# APG<sup>®</sup>

## Intense and gentle cleansing

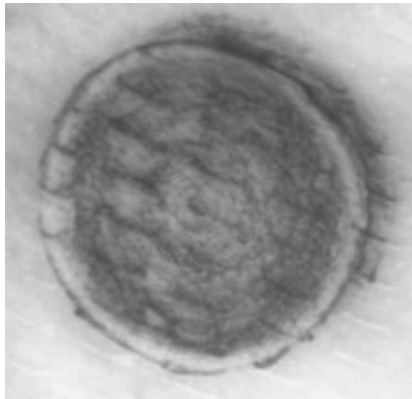
**BASF**  
The Chemical Company



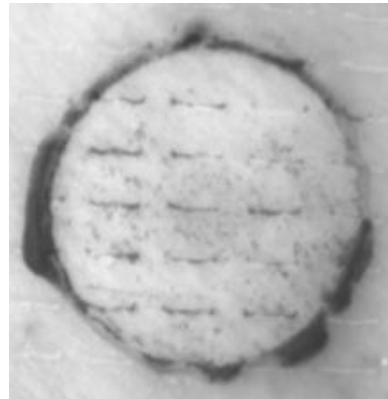
Pre-washed skin



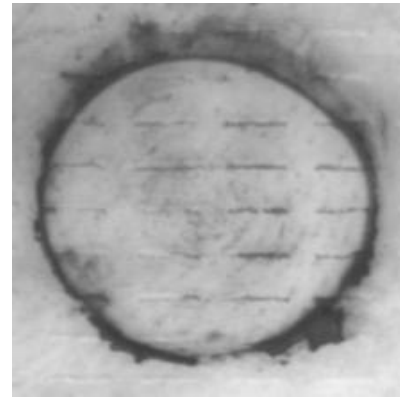
Treated with soil



Washed with water

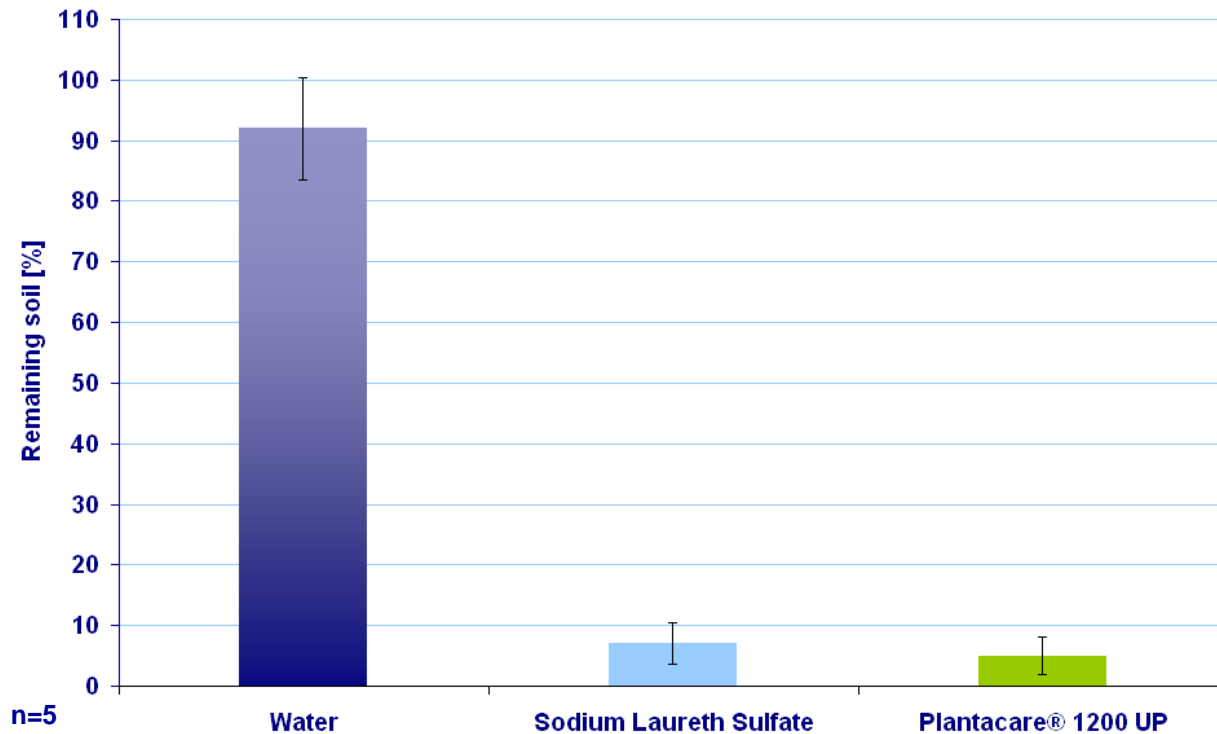


Washed with  
Sodium Laureth Sulfate



Washed with  
Plantacare<sup>®</sup> 1200 UP

### Deep pore cleansing

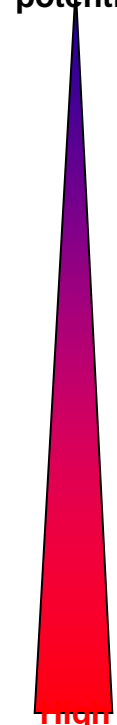


Alkyl polyglucoside owns a comparable cleansing efficacy to other main surfactants while also providing the additional benefit of exceptional mildness in personal care applications.

### Acute eye irritation test: Histology at 10 min. & 3 h

12% AS applied to 3D human cornea equivalent models

Low irritation potential



High irritation potential

PBS\*/  
negative control

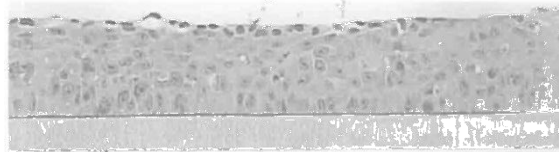


10 minutes



3 hours

Coco-  
Glucoside

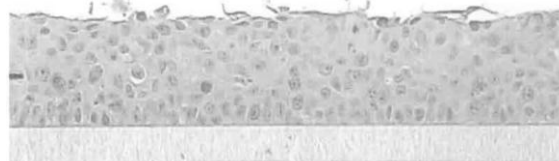


10 minutes

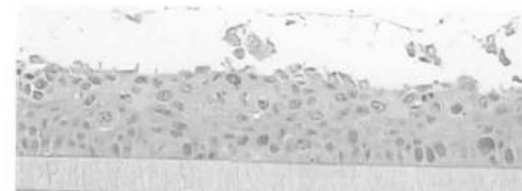


3 hours

Sodium Laureth  
Sulfate

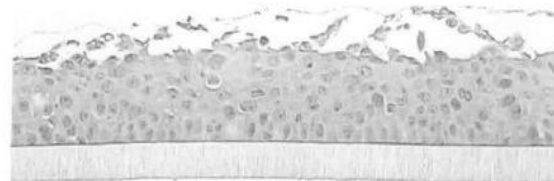


10 minutes

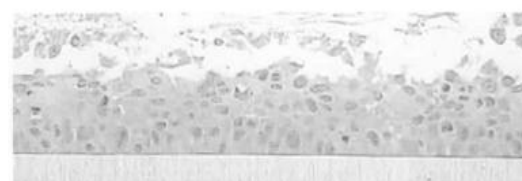


3 hours

Ammonium  
Lauryl Sulfate



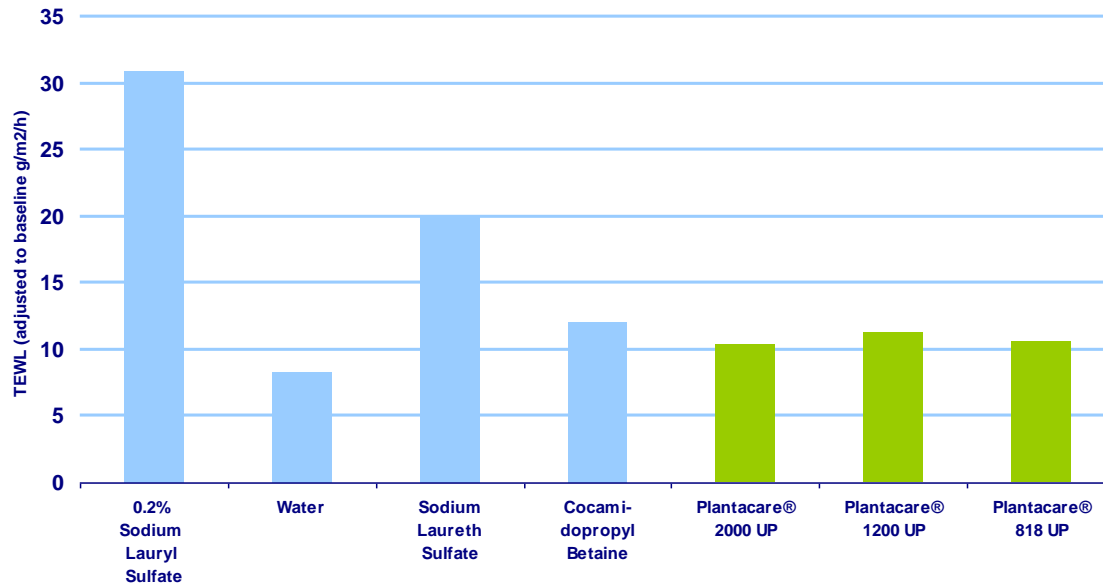
10 minutes



3 hours

### Soap Chamber Test: TEWL on day 5

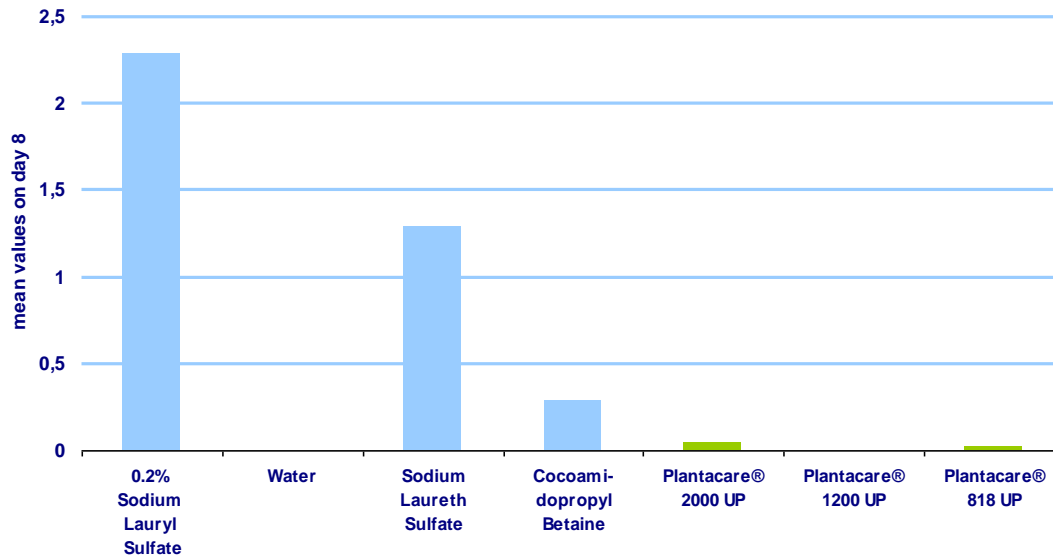
1% AS, pH 6.5; repeated occlusive applications (5 consecutive days), forearms, 22 volunteers  
 The positive control SDS was tested with 0.2% active substance content (AS)



The cumulative irritation potential of surfactants assessed by Transepidermal water loss (TEWL) on day 5 shows lower irritation potential of alkyl polyglucosides in comparison to other surfactants tested.

### Soap Chamber Test: Dryness on day 8

1% AS, pH 6.5; forearms, 22 volunteers; skin dryness assessed on day 8  
 The positive control SDS was tested with 0.2% active substance content (AS)



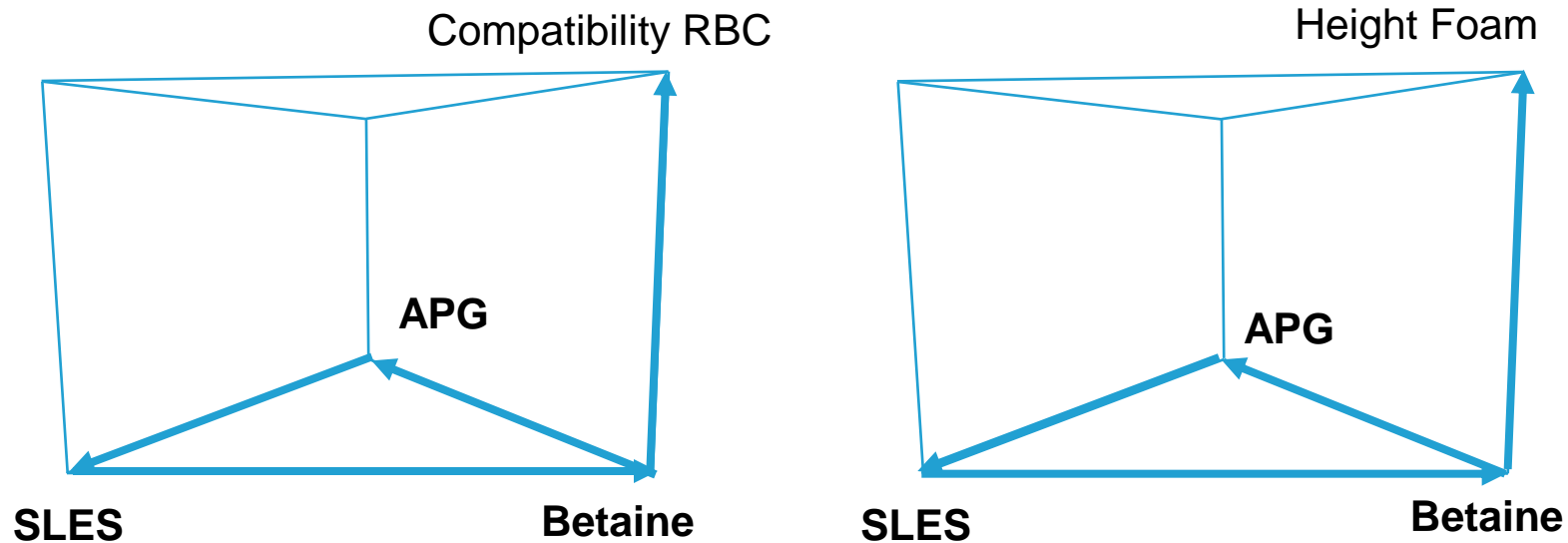
Skin dryness assesses on day 8 shows confirmed that alkyl polyglucosides are the surfactants with lowest dryness mean value in comparison to other surfactants tested.

# APG®

## Optimized Balance of Mildness and Foam

**BASF**  
The Chemical Company

FAST (Formulation Assisting Software Toolkit)

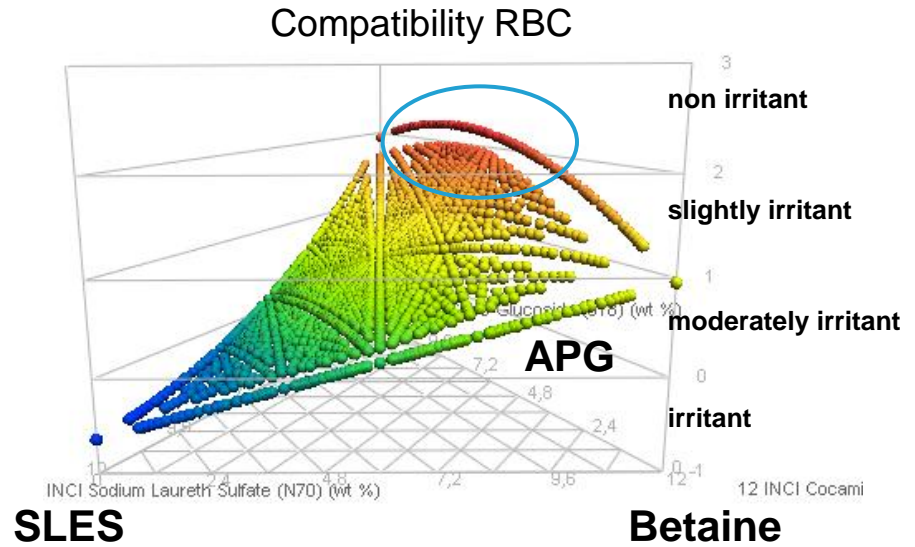
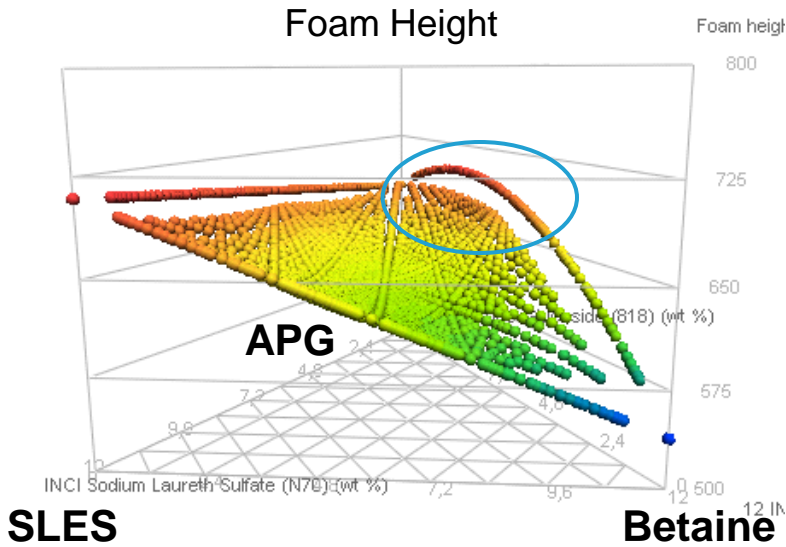


Total active matter 12%

### Foaming Performance

SITA Foam/ 2% Product Solution/ 2,68 mmol Ca<sup>2+</sup>/ 30° C/ 1000rpm

### Mucous Membrane Compatibility

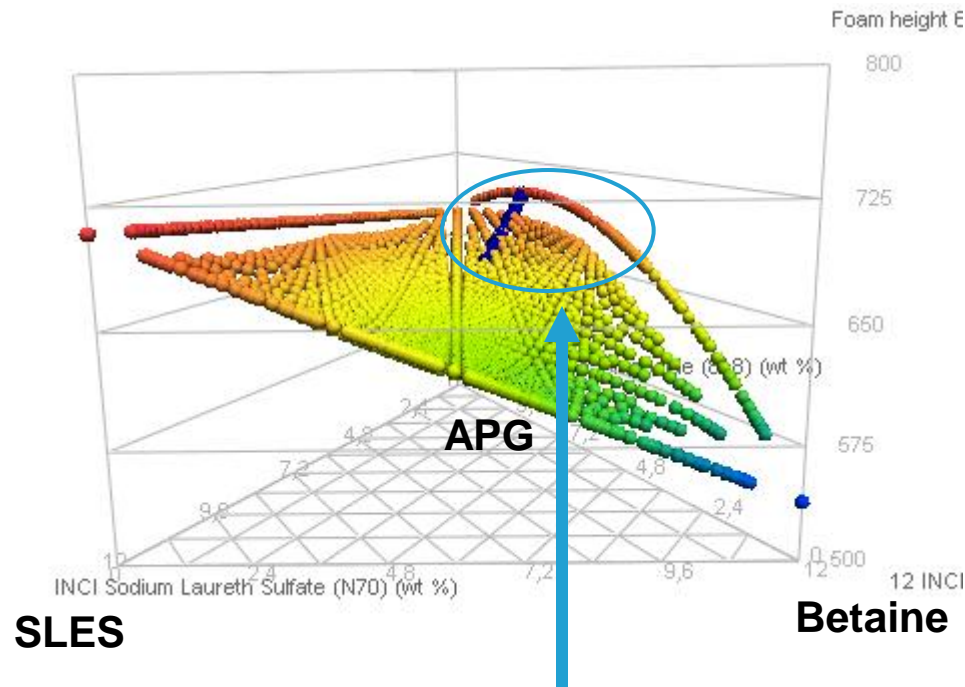


Total active matter 12%

# APG®

## Optimized Balance of Mildness and Foam

**BASF**  
The Chemical Company



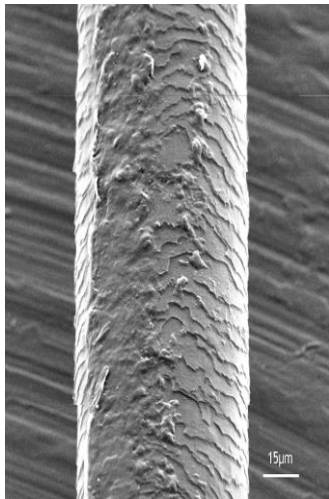
“APG® in combinations with Cocamidopropyl betaine (3,6% CAPB:8,4% Plantacare® 818) represents the best option for achieving good foam and skin compatibility” Maximise Foam and Maximise Compatibility (minimum slightly irritant).

# APG® for Shampoo

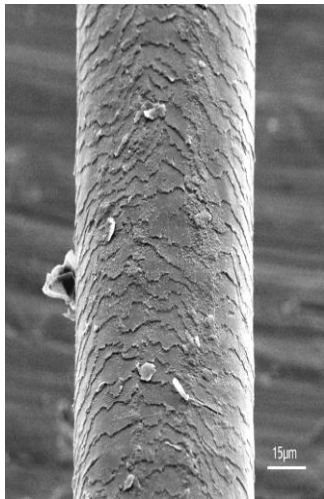


### Scanning Electron Microscopy (SEM) images

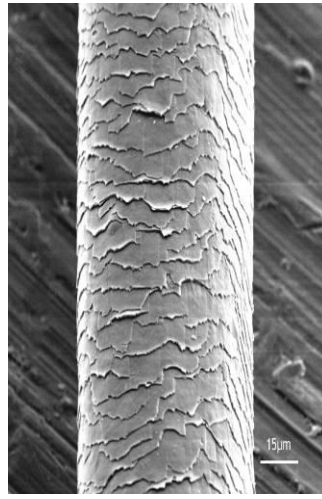
3 ml of surfactant solution (at 10 %) was used per hair tress.  
After foaming, the shampoo was in contact during 3 minutes and thereafter the hair tress was rinsed under tap water during one minute.



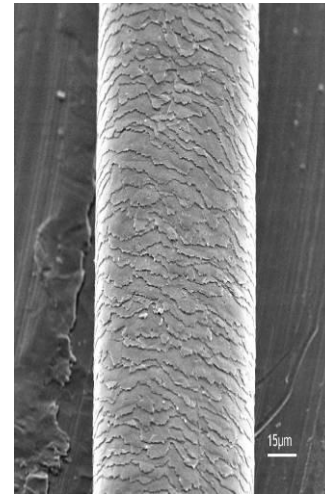
**Sebum**



**Water**



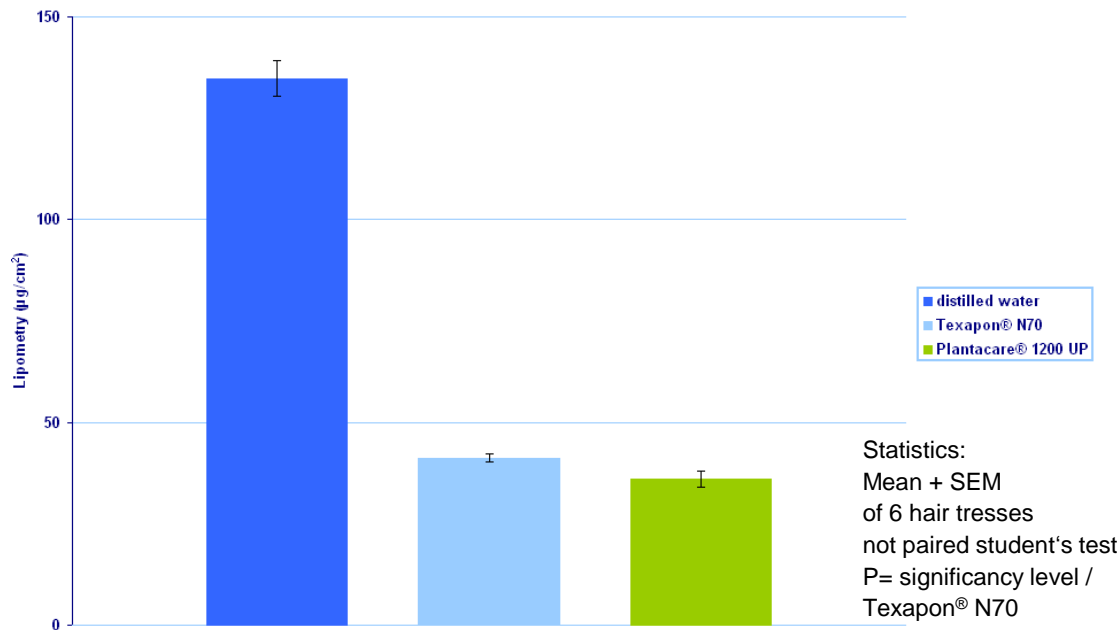
**Sodium Laureth Sulfate**



**Plantacare<sup>®</sup> 1200 UP**

Washing with Plantacare<sup>®</sup> 1200 UP the surface layer of the hair cuticle remains uniform, the hair fiber has very regular and smooth aspect and is clean.

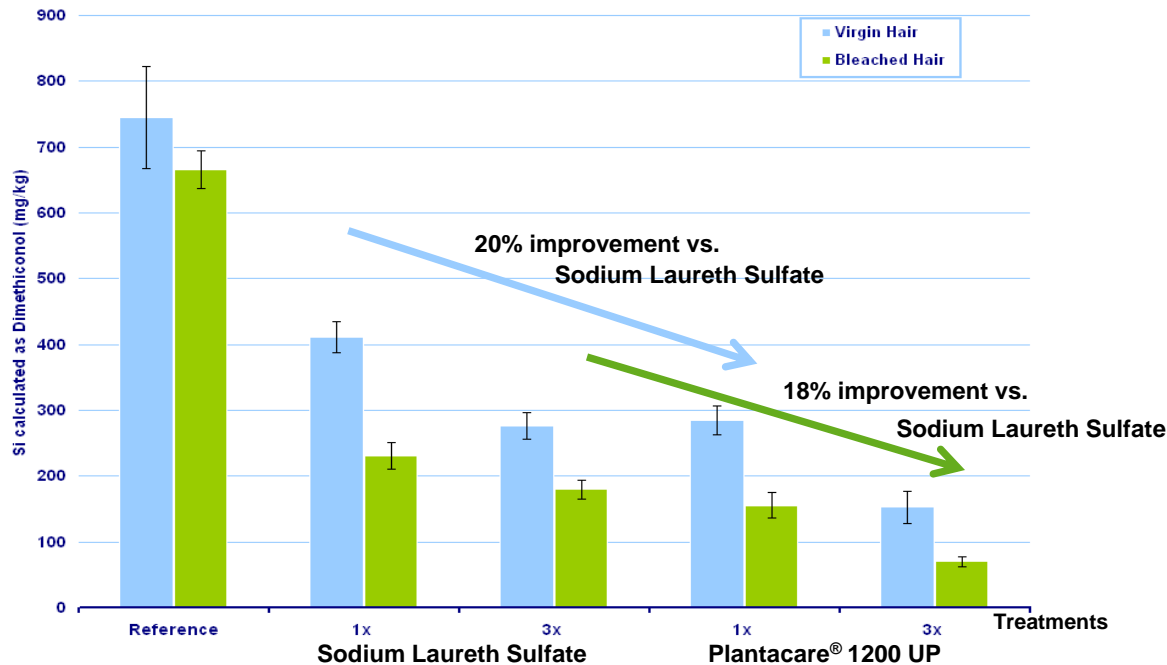
### Deep pore cleansing



Cleansing efficacy of Plantacare® 1200 UP shows comparable effects to Sodium Laureth Sulfate. This underlines the suitability of Alkyl polyglucoside as an effective natural-source shampoo surfactant that is gentle to hair fibers.

### Stripping Shampoo

All hair strands (virgin and bleached) were firstly treated with silicone shampoo (Dove 2 in 1 containing 1,2 % dimethiconol). Afterwards they were cleansed with 10 % active matter solution of Sodium Laureth Sulfate and Plantacare® 1200 UP one and three times respectively.



Plantacare® 1200 UP shows high efficacy in removing chemical residues from the hair.

# APG<sup>®</sup>

## Excellent Foam Height

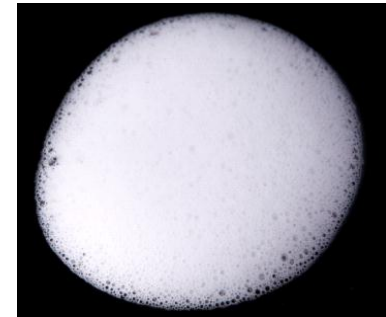
**BASF**  
The Chemical Company

12% active matter; 10 sec., 2.000 rpm, water hardness 2,68 mmol Ca 2+



5:1

SLS: Cocamidopropyl Betaine



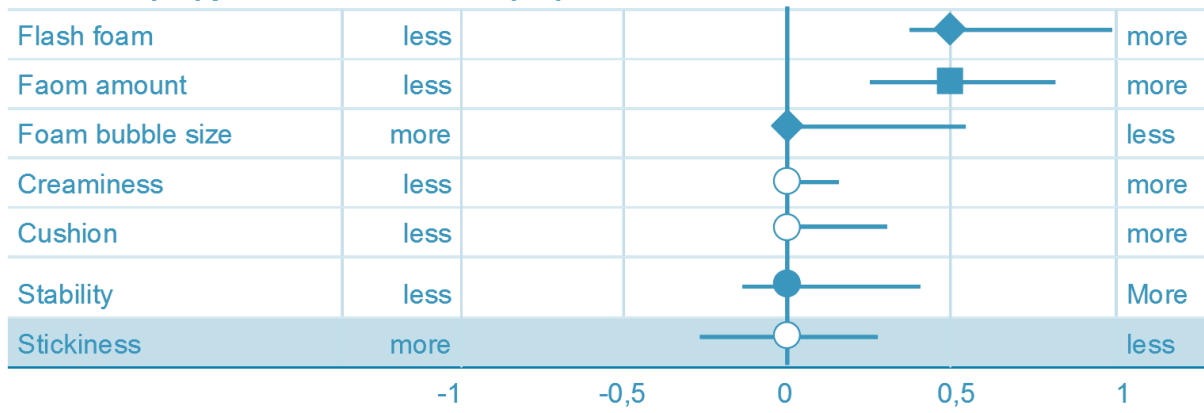
5:1

SLS: Plantacare<sup>®</sup> 2000 UP

Plantacare<sup>®</sup> 2000 UP is a non ionic surfactant that improves the foam properties of shampoos: good stable qualitative and quantitative foam.

### Wet hair

Pairwise comparison of the product Plantacare® 818 UP with reference product Cocamidopropyl Betaine for different properties



Filled symbol: Wilcoxon test

- Not significant
- Significance > 95%
- Significance > 99%

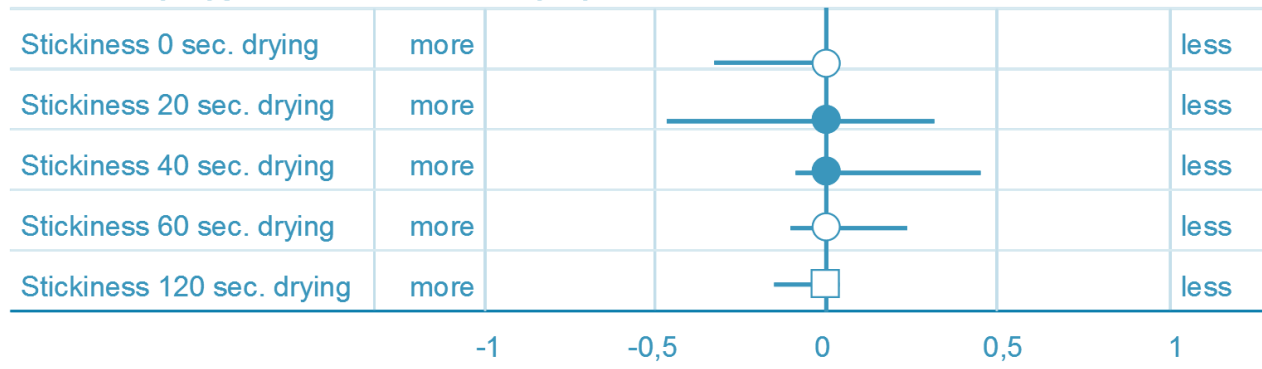
Empty symbol: 90% lower confidence bound (l.c.b) for zero values

- l.c.b. < 0,66667
- l.c.b. > 0,66667

As main surfactant in a shampoo, APG® showed no difference in terms of stickiness in hair drying compared to Cocamidopropyl Betaine.

### Hair drying

Pairwise comparison of the product Plantacare® 818 UP with reference product Cocamidopropyl Betaine for different properties



Filled symbol: Wilcoxon test

- Not significant
- ◆ Significance > 95%
- Significance > 99%

Empty symbol: 90% lower confidence bound (l.c.b) for zero values

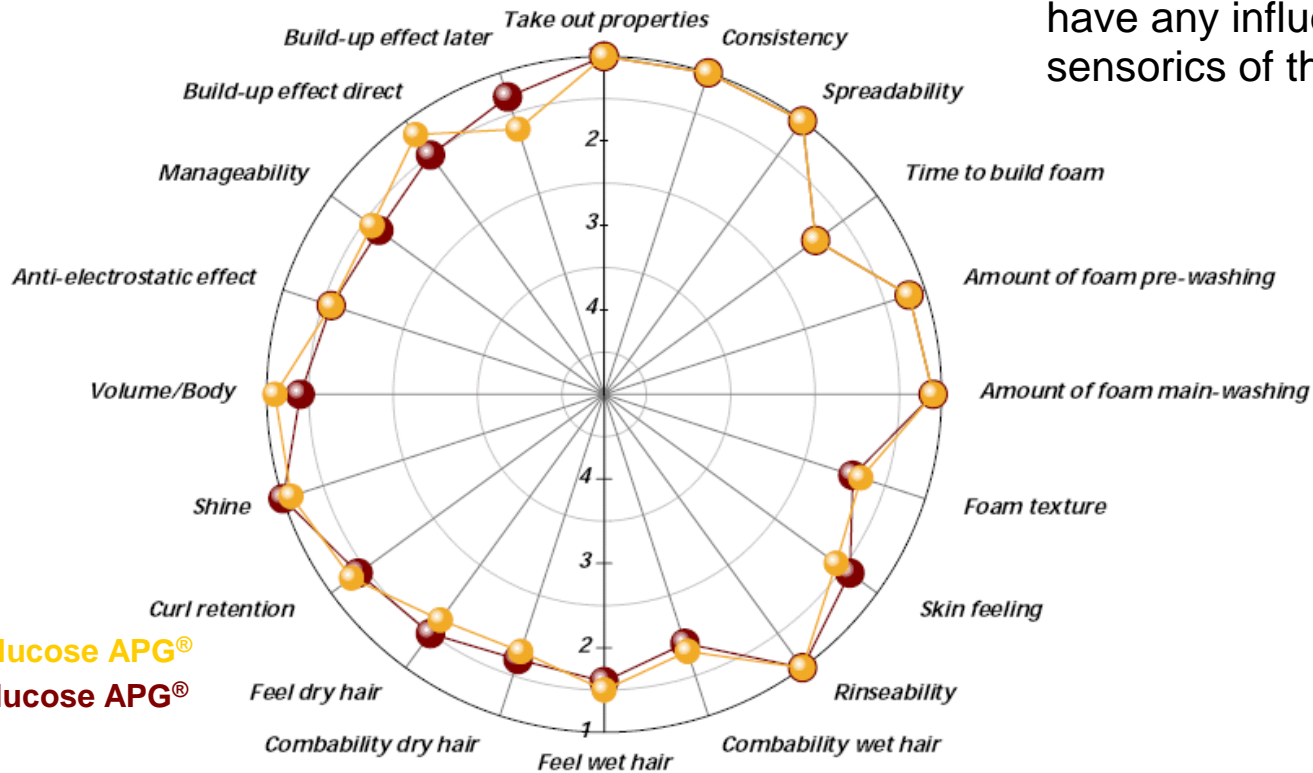
- l.c.b. < 0,66667
- l.c.b. > 0,66667

As main surfactant in a shampoo, APG® showed no difference in terms of stickiness in hair drying compared to Cocamidopropyl Betaine

### Half-Head test results

Mean value (n=10)

1 - very good, 2 - good, 3 - satisfactory, 4 - poor, 5 - very poor



Free polyglucose does not have any influence on the sensorics of the product.

- High-polyglucose APG®
- Low-polyglucose APG®

This document, or any answers or information provided herein by BASF, does not constitute a legally binding obligation of BASF. While the descriptions, designs, data and information contained herein are presented in good faith and believed to be accurate, it is provided for your guidance only. Because many factors may affect processing or application/use, we recommend that you make tests to determine the suitability of a product for your particular purpose prior to use. It does not relieve our customers from the obligation to perform a full inspection of the products upon delivery or any other obligation. The claims and supporting data provided in this publication have not been evaluated for compliance with any jurisdiction's regulatory requirements and the results reported may not be generally true under other conditions or in other matrices. Users must evaluate what claims and information are appropriate and comply with a jurisdiction's regulatory requirements. **NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESIGNS, DATA, OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS. IN NO CASE SHALL THE DESCRIPTIONS, INFORMATION, DATA, OR DESIGNS PROVIDED BE CONSIDERED A PART OF OUR TERMS AND CONDITIONS OF SALE.**