# BETADET® S-20

# BETADET® SHR

**VERY MILD SURFACTANT**
**GREAT FORMULATION STABILITY**
**ENHANCED FOAM VOLUME**
**IMPROVED THICKENING EFFECT**

## SULTAINES: MILD AMPHOTERIC SURFACTANTS FOR PERSONAL CARE

KAO SURFACTANTS TECHNOLOGY AT YOUR SERVICE

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# BETADET® S-20 & BETADET® SHR Foam, Viscosity & Mildness enhancers

**BETADET® S-20 and BETADET® SHR are very mild co-surfactants for personal care formulations.**

Hydroxysultaines are highly effective amphoteric Surfactants that improve the performance of final cosmetic products. They are extremely mild cosurfactants that increase the performance of personal care formulations compared to alkylbetaines and amidopropyl betaines.

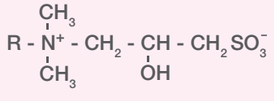
## MAIN FEATURES

- Vegetable origin
- Preservative-free
- Biodegradable
- Compatible with anionic, non-ionic and cationic surfactants
- Provide excellent thickening
- Foam booster and foam stabilizer
- Extremely mild for the eyes and skin
- Stable at a wide range of pH and temperatures
- Good ecotoxicological profile
- Biocidal activity

## TECHNICAL DATA

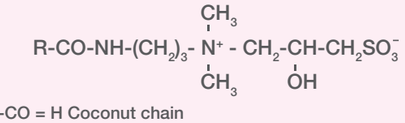
| | BETADET® S-20 | BETADET® SHR |
|---|---|---|
| **Appearance** (25ºC) | Colorless to light yellow transparent liquid | |
| **Dry Matter** (%) | 43 - 47 | 49 - 51 |
| **Viscosity** (20ºC, cP) | < 50 | < 200 |
| **pH** | 6.0 - 8.0 (1% in water) | 7.0 - 8.0 (as it is) |

### BETADET® S-20 Lauryl Hydroxysultaine




R= $C_{12}$

### BETADET® SHR Cocamidopropyl Hydroxysultaine




R-CO = H Coconut chain

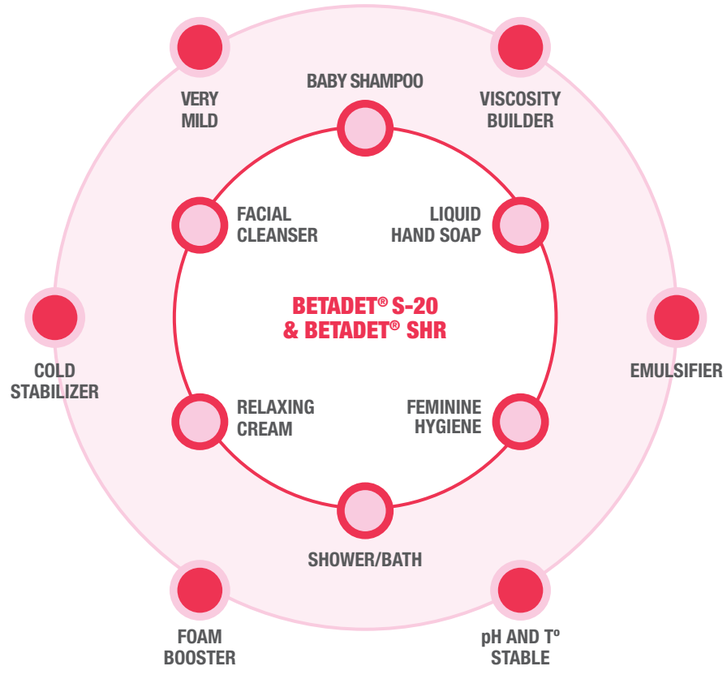
## CHARACTERISTICS

BETADET® S-20 and BETADET® SHR are recommended as secondary surfactants for very mild and high foaming products, achieving higher foam volumes than alkyl betaines or alkyl amidopropyl betaines. These products are easier to thicken when combined with SLES, thus reducing the amount of electrolytes needed to obtain a desired viscosity compared to other amphoteric surfactants. Hydroxysultaines show excellent stability at extreme pH's thus allowing their use in cosmetics formulations were alkali (i.e. depilatories) or acid media are necessary. Both products are also very stable to hard water, improving the behavior of some sensitive anionic surfactants under extreme conditions. Additionally, BETADET® S-20 shows a highlighted ability to reduce the freezing point of final formulations making them more stable at low temperatures, which helps to obtain clear stable final products.

PROPERTIES

APPLICATION

BETADET® S-20 and BETADET® SHR are liquid, colorless and transparent concentrated amphoteric surfactants, very easy to handle, with low viscosity at room temperature.



# MAIN PROPERTIES

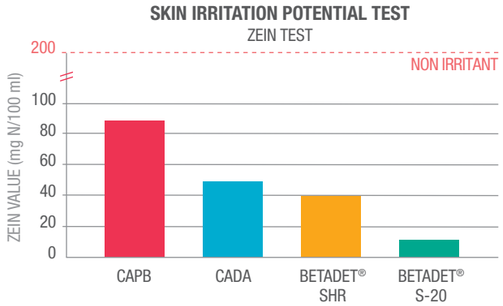
In order to compare the properties of BETADET® S-20 and BETADET® SHR with other betaines, a Model Formula has been studied with standard levels of anionic surfactant (SLES), non-ionic thickener (CDEA) and the Amphoteric Surfactant as the variable. pH has been adjusted to 6.5 in all cases.

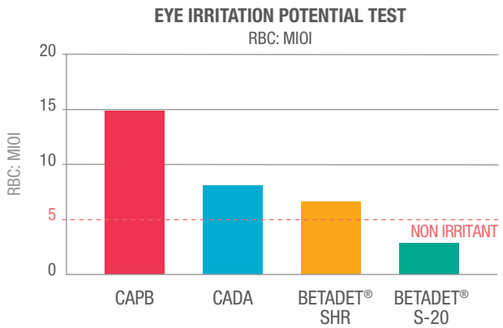
| MODEL FORMULA | % in active matter (a.m.) |
|---|---|
| **Sodium Laureth Sulfate** | 10.0 |
| **Cocamide DEA** | 1.5 |
| **AMPHOTERIC SURFACTANT** | 3.0 |
| **Deionized Water** | Up to 100 |

## MILDNESS

There's an ever-growing awareness over consumers of rinse-off products to buy the correct one for their skin. Babies, elders, people with sensitive epidermis… all of them need very mild formulations to avoid dryness, itchiness or even rashes on their skin. The mildness of amphoteric surfactants is well known but hydroxysultaines are especially mild to the eyes and skin, as it can be seen in the graphs.

BETADET® S-20 and BETADET® SHR are excellent options to formulate a wide variety of very mild end products such as intimate hygiene cleansers or no-tears baby shampoos. They both show detoxifying properties, reducing the irritation produced by anionic surfactants.



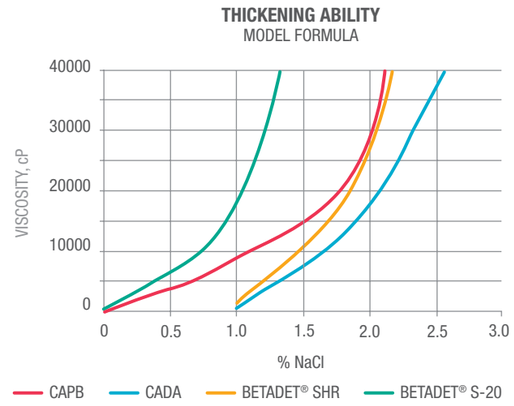




Ref. C-100

| BABY SHAMPOO | % |
|---|---|
| **EMAL® 270D** Sodium Laureth Sulfate | 12.0 |
| **BETADET® S-20** Lauryl Hydroxysultaine | 7.0 |
| **LEVENOL® H&B** Glycereth-2 Cocoate | 2.0 |
| **AKYPO® FOAM RL 40** Sodium Laureth-5 Carboxylate | 1.5 |
| **AMIDET® N** PEG-4 Rapeseedamide | 1.5 |
| **EDTA.$Na_2$** | 0.05 |
| **Additives*** | q.s. |
| **Deionized Water** | Up to 100 |

## THICKENING ABILITY

BETADET® S-20 has a great thickening ability in SLES-based rinse-off products and even in other anionic-based formulations. It achieves higher viscosity levels when compared with alkyl betaines, alkyl amidopropyl betaines and alkyl amphodiacetates so less amount of product (or electrolytes) can be used. BETADET® SHR shows a viscosity profile close to cocamidopropyl betaine and better than disodium cocoamphodiacetate, in SLES based formulations.




CAPB: Cocamidopropyl Betaine
CADA: Disodium Cocoamphodiacetate
CDEA: Cocamide DEA
SLES: Sodium Laureth Sulfate

*Additives: Perfume, dyes, preservatives, etc.

Ref. C-294

| HIGH FOAMING BODY WASH | % |
|---|---|
| **SUCCIDET® S-30** Disodium Laureth Sulfosuccinate | 17.6 |
| **Sodium Cocoyl Glutamate** | 25.6 |
| **BETADET® SHR** Cocamidopropyl Hydroxysultaine | 6.8 |
| **AMIDET® N** PEG-4 Rapeseedamide | 1 |
| **LEVENOL® H&B** Glycereth-2 Cocoate | 0.5 |
| **KAOPAN® TW-IS399S** PEG-160 Sorbitan Triisostearate | 4 |
| **Additives*** | q.s. |
| **Deionized Water** | Up to 100 |

Ref. C-227

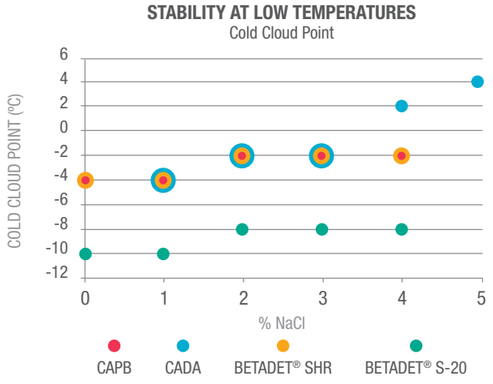
| NON-IRRITANT SHOWER GEL | % |
|---|---|
| **ALFANOX® 46** Sodium α-Olefine Sulfonate | 27.0 |
| **BETADET® S-20** Lauryl Hydroxysultaine | 10.5 |
| **AMIDET® N** PEG-4 Rapeseedamide | 2.1 |
| **EXCEPARL® LM-LC** Lauryl Lactate | 0.3 |
| **Additives*** | q.s. |
| **Deionized Water** | Up to 100 |

Due to their mildness and foaming performance, BETADET® SHR and BETADET® S-20 are recommended co-surfactants to be combined with alternative anionic surfactants, such as Sodium α-Olefin Sulfonate or Disodium Laureth Sulfossuccinate. Sulfate-free, mild and high foaming formulations can be obtained. The addition of effective thickeners is usually needed. At Kao Chemicals Europe, we recommend for this purpose, EXCEPARL® LM-LC (Lauryl Lactate) or KAOPAN® TW-IS3099S (PEG-160 Sorbitan Triisostearate).

# MAIN PROPERTIES

## COLD STABILITY

Of among the most used amphoteric surfactants in personal care, BETADET® S-20 shows an outstanding and better stability at low temperature, thus helping formulators to get clear products in tough conditions. Cloud point test by cold, performed using the Model Formula shows the advantages of using BETADET® S-20, with better haziness points, compared to other types of betaines.



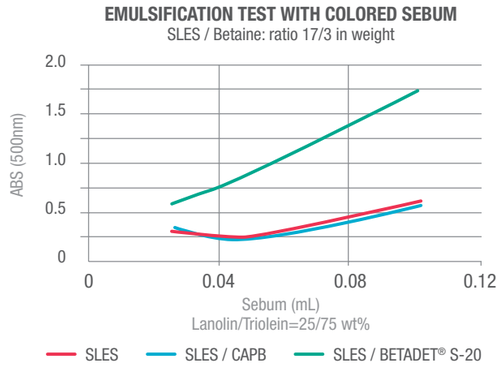

Ref. C-161

| FORTIFYING SHAMPOO | % |
|---|---|
| **EMAL® 270D** Sodium Laureth Sulfate | 14.3 |
| **AKYPO® SOFT 100 BVC** Sodium Laureth-11 Carboxylate | 5.7 |
| **BETADET® S-20** Lauryl Hydroxysultaine | 5.0 |
| **LEVENOL® H&B** Glycereth-2 Cocoate | 2.0 |
| **Hair Loss Prevention Complex** | 2.0 |
| **Promois® WJ** Hydrolyzed Pea Protein | 2.0 |
| **Additives*** | q.s. |
| **Deionized Water** | Up to 100 |

CAPB: Cocamidopropyl Betaine
CADA: Disodium Cocoamphodiacetate
CDEA: Cocamide DEA
SLES: Sodium Laureth Sulfate

## EMULSIFYING ABILITY

Lauryl hydroxysultaine is capable of emulsifying oils and sebum more thoroughly than other betaines so the washing process becomes more effective. BETADET® S-20 avoids the redeposition of hydrophobic substances to the skin so it is also advised for facial cleansing formulations. The results of the test emulsion showed below demonstrate the great emulsifying ability of BETADET® S-20 compared to CAPB.



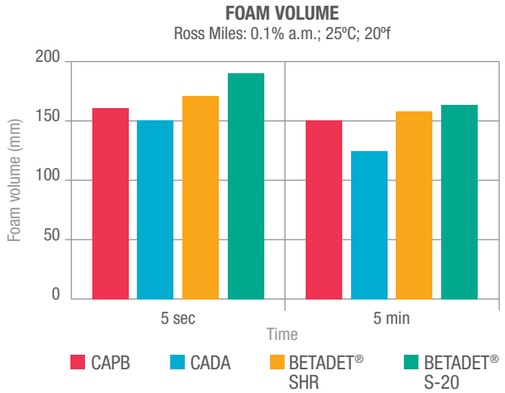

Ref. C-222

| SENSITIVE SKIN FACE CLEANSER | % |
|---|---|
| **EMAL® 270D** Sodium Laureth Sulfate | 9.7 |
| **AKYPO® FOAM RL 40** Sodium Laureth-5 Carboxylate | 3.3 |
| **BETADET® S-20** Lauryl Hydroxysultaine | 5.3 |
| **Glycerine** | 2.0 |
| **Propylene Glycol** | 1.5 |
| **Carbopol Ultrez** Carbomer | 1.3 |
| **Additives*** | q.s. |
| **Deionized Water** | Up to 100 |

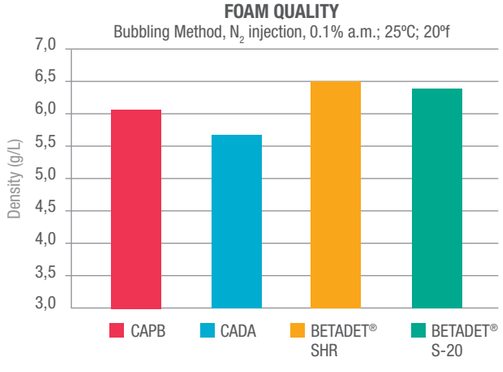
*Additives: Perfume, dyes, preservatives, etc.

## FOAMING ABILITY

Sultaines are excellent foaming surfactants at different pH's and even at high concentration of cationic ions ($Ca^{2+}$ and $Mg^{2+}$). When they are combined with anionic surfactants, all foam characteristics are improved: foam volume, foam formation speed and foam quality or higher density.

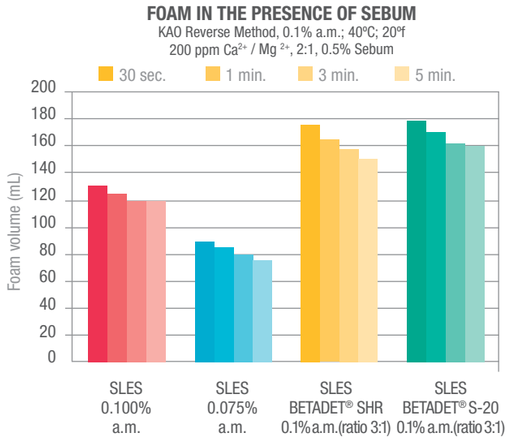



In the graphs, the Model Formula is used to show the advantageous foaming properties of sultaines compared to other amphoteric surfactants.

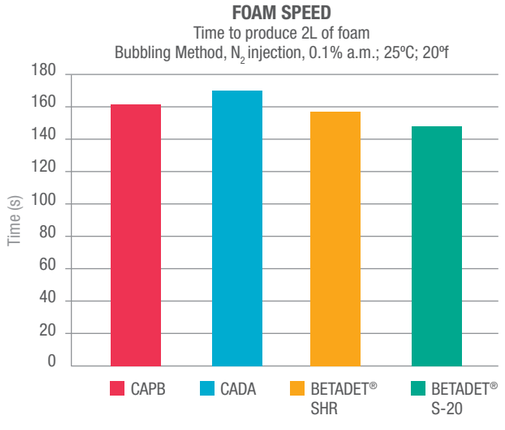



Ref. C-160

| CONDITIONING SHAMPOO | % |
|---|---|
| **EMAL® 270D** Sodium Laureth Sulfate | 8.6 |
| **AKYPO® FOAM RL 40** Sodium Laureth-5 Carboxylate | 4.7 |
| **BETADET® SHR** Cocamidopropyl Hydroxysultaine | 6.8 |
| **AMIDET® APA-22** Behenamidopropyl Dimethylamine | 0.5 |
| **DANOX® PL-10** Pearling Agent | 4.0 |
| **Polyquaternium-10** | 0.2 |
| **PEG-12 Dimethicone** | 0.5 |
| **Ethyl Panthenol** | 0.2 |
| **D-Panthenol (50% solution)** | 0.2 |
| **Additives*** | q.s. |
| **Deionized Water** | Up to 100 |




Sultaines are also highly foaming in the presence of sebum or oils. The foaming ability of a formulation is substantially improved after the addition of BETADET® S-20 or BETADET® SHR due to their emulsifying properties.



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