



**Stepan**   
Personal Care

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Sulfate-Free



# Stepan Company is a global leader in providing sulfate-free ingredients for the personal care market.

## What is “Sulfate-Free?”

“Sulfate-free” is a term that usually refers to anionic detergents that are not sodium lauryl sulfate (SLS) or sodium laureth sulfate (SLES). Stepan defines sulfate-free as containing no alcohol sulfate or alcohol ether sulfate, per INCI nomenclature.

## Why are sulfate-free surfactants better for consumers?

Sulfate-free surfactants are generally milder to the hair and skin than SLS or SLES, which means that fresh hair color can last longer and skin may feel softer.

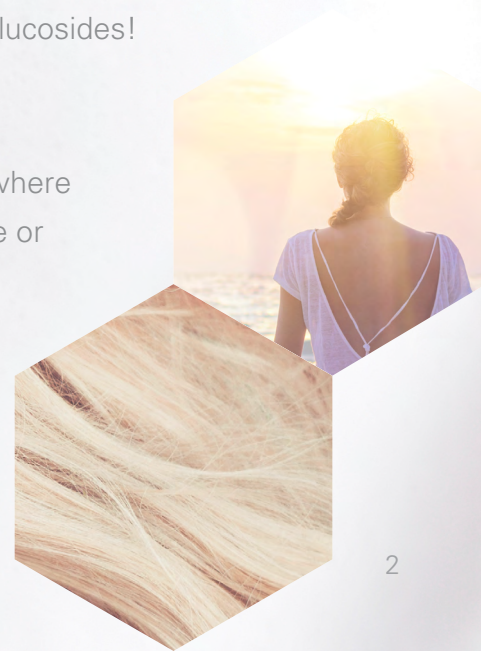
## Are there any downsides?

Sulfate-free surfactants are known for being mild, but unfortunately they may not perform as well as their sulfate counterparts. Typically, sulfate-free surfactants do not foam as much as sulfate surfactants and may leave build-up in hair, and formulators may find that they have trouble thickening products containing sulfate-free surfactants.

Stepan offers several specialty surfactants that provide improved foaming and powerful thickening to build viscosity with sulfate-free ingredients, even glucosides!

## How should a formulator choose a sulfate-free surfactant?

Each sulfate-free chemistry can offer unique benefits. Not sure where to start? Check out the flowchart on pages 19-20 of this brochure or contact a Stepan Technical Service representative in your region.





# ALPHA-STEP® PC-48

Sulfate-free | Light and airy foam

**INCI Name** Sodium Methyl 2-Sulfolaurate and Disodium 2-Sulfolaurate

**Appearance** Clear Yellow Liquid

**Actives** 37-40%

**Pour Point** -5°C

**Preservative** None



Meets Whole Foods Market®  
Premium Body Care Standards  
Rinses cleanly and easily  
Soft skin after-feel



94% Bio-based  
Readily biodegradable  
No preservative



CleanGredients® listed  
Economical performance  
Hydrotropic properties

## Scrub Me Sweetie

Water-Based Sugar Scrub Formulation No.1270

Meets Whole Foods Market® Premium Body Care Standards

### Ingredient

### % by weight

STEPAN-MILD® GCC

*Glyceryl Caprylate/Caprates*

5.00

Shea Butter

0.40

Soybean Oil

4.50

Fragrance

0.40

**ALPHA-STEP® PC-48**

7.50

Sugar

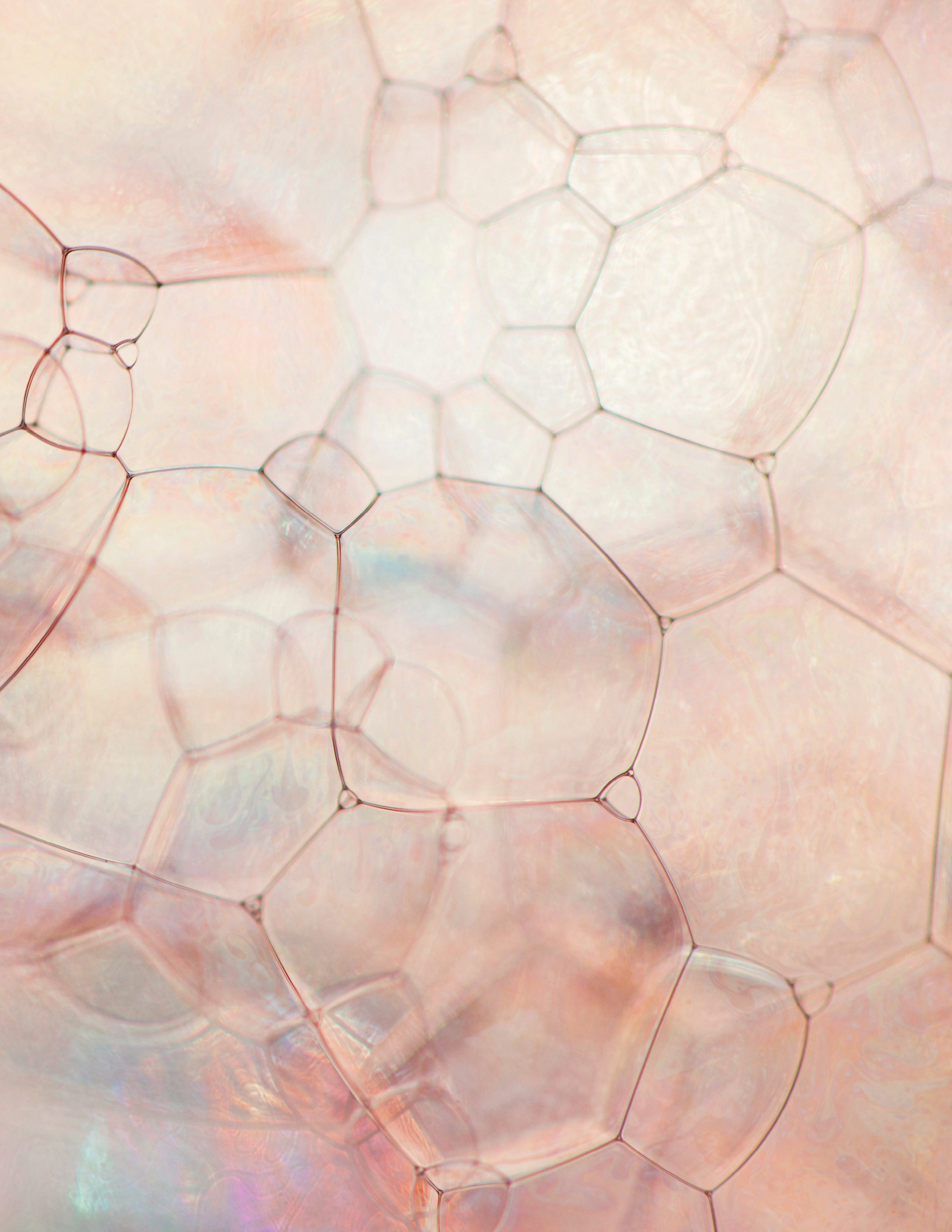
70.00



*STEPAN-MILD® GCC is used as a structuring agent to suspend the sugar particles.*



*Due to the high sugar and low water content, a preservative is not required for this formula!*



# BIO-TERGE® AS-40 HP

Sulfate-free | Economical foamer

**INCI Name** Sodium C14-16 Olefin Sulfonate

**Appearance** Clear Amber Liquid

**Actives** 39%

**Pour Point** -4°C

**Preservative** None



Lots of cushiony lather  
Mild cleanser  
Won't strip natural oils



Never tested on animals  
Readily biodegradable  
No preservative



Flexible pH range  
Economical performance  
Hydrotropic properties

## Premium Conditioning Sulfate-Free Shampoo

Formulation No.1258

Ingredient	% by weight
PenCare DP 1015 Cationic Polymer (Penford)	0.08
<b>BIO-TERGE® AS-40 HP</b>	36.00
AMPHOSOL® HCG <i>Cocamidopropyl Betaine</i>	12.00
STEPAN-MILD® L3 <i>Lauryl Lactyl Lactate</i>	0.50
Hallstar® EGMS (Hallstar)	0.40
NINOL® CAA <i>Dimethyl Lauramide/Myristamide</i>	1.80
Fragrance	0.50
Moringa Oil	0.05
Dow Corning® CE-1874 Silicone Polyether Microemulsion (Dow Corning)	2.00



“HP” products are preserved with excess sodium hydroxide, offering the formulator flexibility to choose the final preservative. These surfactants require just a small additional amount of citric acid to neutralize.



NINOL® CAA builds viscosity without the need for additional salt.





# LATHANOL® LAL

Sulfate-free | Rich lather, pampered feel

**INCI Name** Sodium Lauryl Sulfoacetate  
**Appearance** Free-Flowing White Powder/Flake  
**Actives** 65% min.  
**Preservative** None



Creamy, rich lather  
Moisturized after-feel  
Mild cleanser



86% Bio-based  
Readily biodegradable  
No preservative

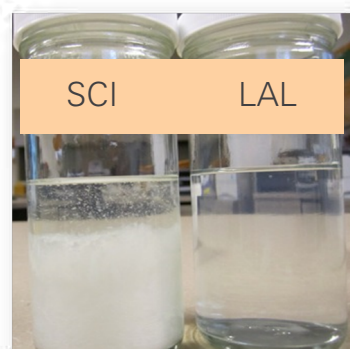


Easier to solubilize than isethionates  
Create low-water products  
Achieve water-white formulas

This Is My  
Natural Color  
Naturally-Derived Color  
Care Shampoo

Formulation No. 1189

Ingredient	% by weight
LATHANOL® LAL Powder	6.90
AMPHOSOL® HCG-HP <i>Cocamidopropyl Betaine</i>	12.90
AMPHOSOL® 2CSF <i>Disodium Cocamphodipropionate</i>	7.00
ALPHA-STEP® PC-48 <i>Methyl Ester Sulfonate</i>	7.80
STEPAN-MILD® GCC <i>Glyceryl Caprylate/Caprate</i>	0.30



At this 6:2 LAL:  
CAPB\* ratio,  
the resulting  
viscosity is  
18,000 cps!



## Better Solubility, Better Stability.

At a 6:2 Anionic:CAPB ratio, LATHANOL® LAL shows better phase stability than SCI\* because LATHANOL® LAL is more soluble than SCI. Formulas containing LATHANOL® LAL and CAPB are homogeneous and likely to have less stability issues than those with SCI.

\*CAPB = Cocamidopropyl Betaine  
\*SCI = Sodium Cocoyl Isethionate



# STEPAN-MILD® SL3-BA

Sulfate-free | Mild co-surfactant



STEPAN-MILD® SL3-BA acts as a great co-surfactant in both traditional and sulfate-free formulations.

**INCI Name** Disodium Laureth Sulfosuccinate

**Appearance** Clear Liquid

**Actives** 32%

**Pour Point** -3°C

**Preservative** Benzoic Acid



Mild cleanser  
Suitable for low-irritation products  
Provides skin softness



55% Bio-based  
Vegetable feedstock



Easy handling and formulating  
Achieve water-white formulas  
Hydrotropic properties  
Globally-approved preservative

## Deep Cleansing Moisturizing Hand Soap

with Oil Microcapsules Formulation No.1227

Ingredient	% by weight
Carbopol ETD 2020 Acrylates/ C10-30 Alkyl Acrylate Crosspolymer (Lubrizol)	0.65
Ethanol	0.75
Versene 100 Tetrasodium EDTA (Dow Chemical)	0.10
STEPANOL® WA-EXTRA PCK <i>Sodium Lauryl Sulfate</i>	30.00
AMPHOSOL® HCG-HP <i>Cocamidopropyl Betaine</i>	6.00
<b>STEPAN-MILD® SL3-BA</b>	2.00
STEPAN-MILD® L3 <i>Lauryl Lactyl Lactate</i>	0.70
Microencapsulated Oil Blend (Hallsrest LTD)	0.30
Lipo WSF 35/60 Walnut Shell Powder (Lipo Chemical)	0.80
Fragrance	1.00



STEPAN-MILD® L3 provides a soft, moisturized skin feel, even hours after application.



Walnut shell powder is a natural alternative to plastic beads.

## Performance Surfactant Blends

Both of these liquid products blend LATHANOL® LAL with another sulfate-free surfactant to provide easy formulating with extra sensory benefits.

# STEPAN-MILD® LSB

## Sulfate-Free | Foamy mildness

**INCI Name** Sodium Lauryl Sulfoacetate and Disodium Laureth Sulfosuccinate

**Appearance** Clear Liquid

**Actives** 25%

**Pour Point** 3°C

**Preservative** Benzoic Acid



Creamy, rich lather  
Moisturized skin after-feel  
Mild cleanser



64% Bio-based  
Vegetable feedstock  
Biodegradable



Easy handling and formulating  
Achieve water-white formulas  
Globally-approved preservative

# Self-Foaming Face Mask

## Similar to a Korean Beauty Trend Product

Formulation No.1261

### Ingredient

Keltrol® CG-SFT (CP Kelco)

Pentylene Glycol

NEOBEE® M-5 Cosmetic  
*Caprylic/Capric Triglyceride*

dl-Menthol

Titanium Dioxide 3328 USP BC (Princeton Chemicals, Inc.)

### STEPAN-MILD® LSB

AMPHOSOL® HCA-HP  
*Cocamidopropyl Betaine*

Polargel® NF BC 342 (Princeton Chemicals, Inc.)

Salicylic Acid, USP Grade

AE COSMOFLUOR® #61 (Princeton Chemicals, Inc.)

### % by weight

1.00

2.00

2.00

0.20

5.00

20.00

10.00

11.00

1.00

1.00



STEPAN-MILD® LSB allows this clay-based mask to rinse cleanly while leaving skin feeling refreshed and clean.

# STEPAN-MILD<sup>®</sup> PCL

Sulfate-Free | An easy, mild clean

**INCI Name** Sodium Methyl 2-Sulfolaurate and Disodium 2-Sulfolaurate and Sodium Lauryl Sulfoacetate

**Appearance** Clear, Light Yellow Liquid

**Actives** 23%

**Pour Point** -5°C

**Preservative** CIT/MIT (Methylchloroisothiazolinone/Methylisothiazolinone)



Creamy, rich lather  
Moisturized skin after-feel  
Rinses cleanly and easily



90% Bio-based  
Vegetable feedstock  
Never tested on animals



Easy handling and formulating  
Incorporate high oil loads  
Achieve water-white formulas





Non-irritating  
to eyes at 5%  
active

Non-irritating  
to skin at 10%  
active

# AMPHOSOL® CS-50

Sulfate-free | The anionic-like amphoteric

**INCI Name** Cocamidopropyl Hydroxysultaine

**Appearance** Clear Viscous Liquid

**Actives** 50%

**Preservative** None



Meets Whole Foods Market®  
Premium Body Care Standards  
Non-irritating to eyes and skin  
Compatible with alpha-  
hydroxy acids



60% Bio-based  
Vegetable feedstock  
No preservative



Good foaming at high oil loads  
Compatible with anionics,  
nonionics, and cationics  
Achieve water-white formulas

## Conditioning Anti-Dandruff Shampoo

Formulation No. 1210

### Ingredient

### % by weight

Carbopol ETD 2020 Polymer (Lubrizol)

0.80

Sodium Hydroxide (50% solution)

0.07

STEPAN-MILD® PCL

*Performance Surfactant Blend*

55.50

**AMPHOSOL® CS-50**

5.50



AMPHOSOL® CS-50 boosts  
the foam in this shampoo  
while enhancing mildness.

STEPAN-MILD® L3

*Lauryl Lactyl Lactate*

0.50



STEPAN-MILD® L3  
provides soft  
conditioning to the  
hair and is a naturally-  
derived alternative to  
silicones!

N-Hance™ 3196 Cationic Guar (Ashland Inc)

0.15

Dow Corning® 2-1491 Emulsion (Dow Corning)

3.30

Zinc Pyrithione (50% active)

2.00

# AMPHOSOL<sup>®</sup> CDB-HP

Sulfate-free | Gentle feel, powerful thickening

<b>INCI Name</b>	Cetyl Betaine
<b>Appearance</b>	Clear Liquid
<b>Actives</b>	30%
<b>Pour Point</b>	-6°C
<b>Preservative</b>	None



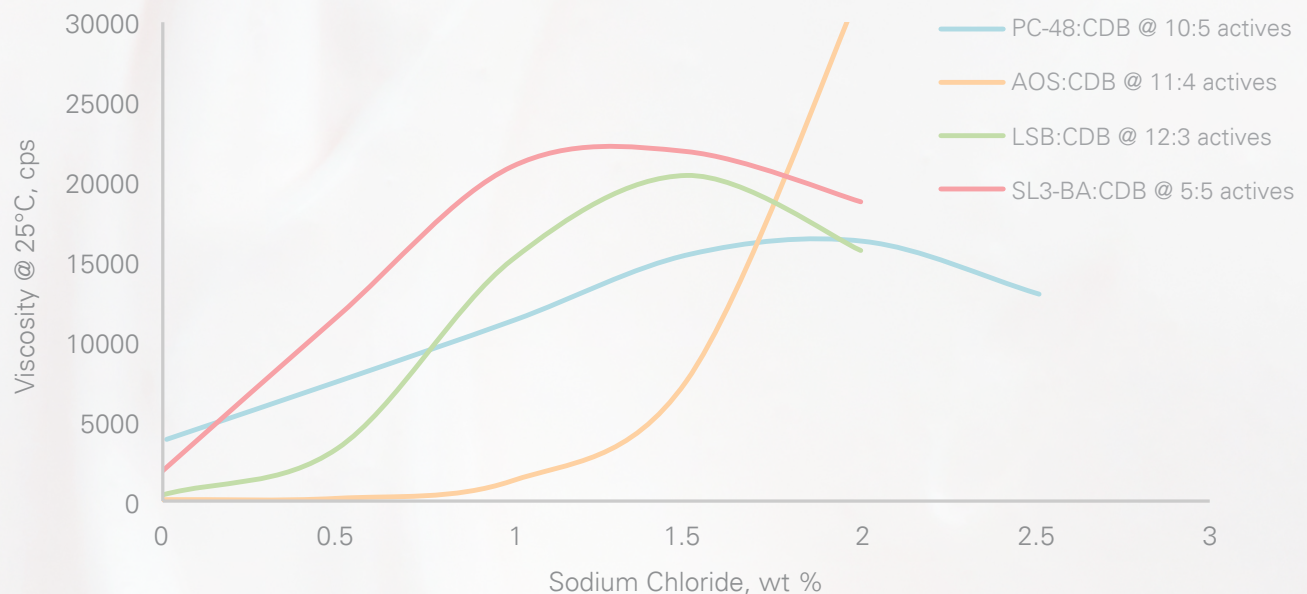
Meets Whole Foods Market<sup>®</sup> Premium Body Care Standards  
Enhances mildness  
Antistatic agent



78% Bio-based  
Readily biodegradable  
No preservative

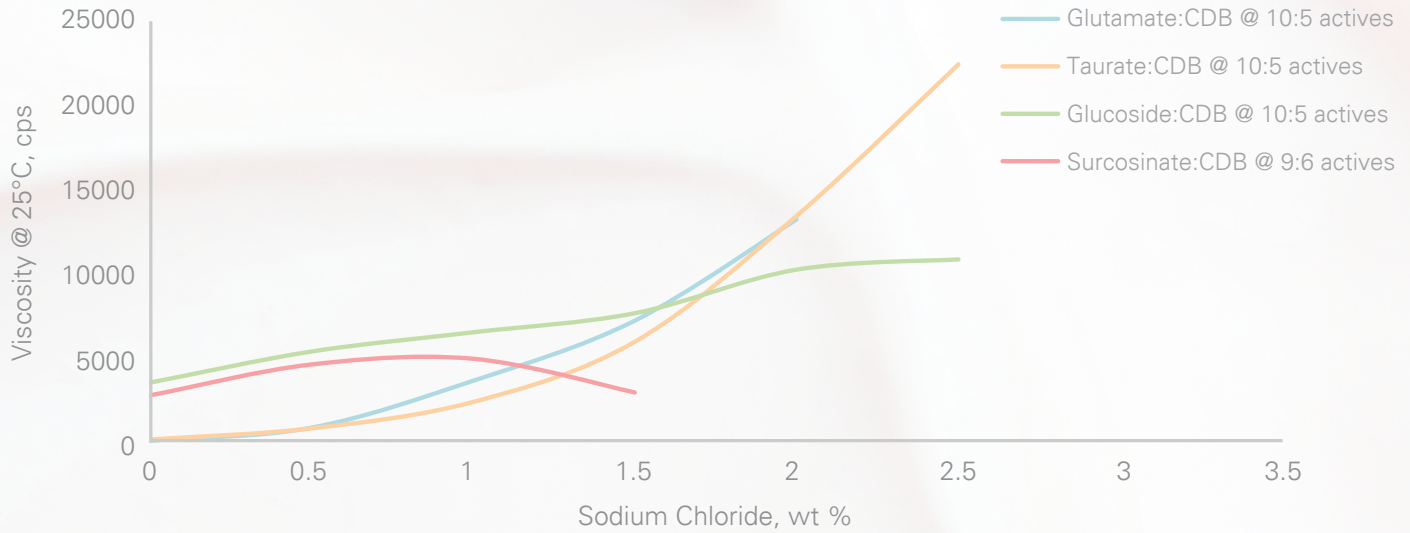


Easily thickens sulfate-free systems, even glucosides  
Easy handling and formulating  
Achieve water-white formulas



AMPHOSOL<sup>®</sup> CDB-HP can provide excellent thickening with almost every sulfate-free anionic surfactant in the Stepan portfolio, even methyl ester sulfonates such as ALPHA-STEP<sup>®</sup> PC-48.





AMPHOSOL® CDB-HP thickens tougher anionic surfactant formulas such as glutamates, taurates, and glucosides.

Abbreviation	Stepan Trade Name	INCI Name
CDB	AMPHOSOL® CDB-HP	Cetyl betaine
PC-48	ALPHA-STEP® PC-48	Sodium methyl 2-sulfolaurate (and) disodium 2-sulfolaurate
AOS	BIO-TERGE® AS-40	Sodium C14-16 olefin sulfonate
LSB	STEPAN-MILD® LSB	Sodium lauryl sulfoacetate (and) disodium laureth sulfosuccinate
SL3-BA	STEPAN-MILD® SL3-BA	Disodium laureth sulfosuccinate
Glutamate	PERLASTAN® SC (Schill + Seilacher)	Sodium cocoyl glutamate
Taurate	HOSTAPON® CT (Clariant)	Sodium cocoyl methyl taurate
Glucoside	GLUCOPON® 625 UP (BASF)	Lauryl glucoside
Sarcosinate	MAPROSYL® 30-B	Sodium lauroyl sarcosinate



# NINOL<sup>®</sup> CAA

Sulfate-free | A superior, multifunctional amide

<b>INCI Name</b>	Dimethyl Lauramide/Myristamide
<b>Appearance</b>	Clear Liquid
<b>Actives</b>	100%
<b>Pour Point</b>	11°C
<b>Preservative</b>	None



Meets Whole Foods Market<sup>®</sup>  
Premium Body Care Standards  
Mild aesthetics enhancer  
Soft skin after-feel



86% Bio-based  
Readily biodegradable  
No preservative



Thickens with little to no  
salt added  
Superior-performing amide  
Solubilizes fragrances



Starting Formulation



With NINOL<sup>®</sup> CAA

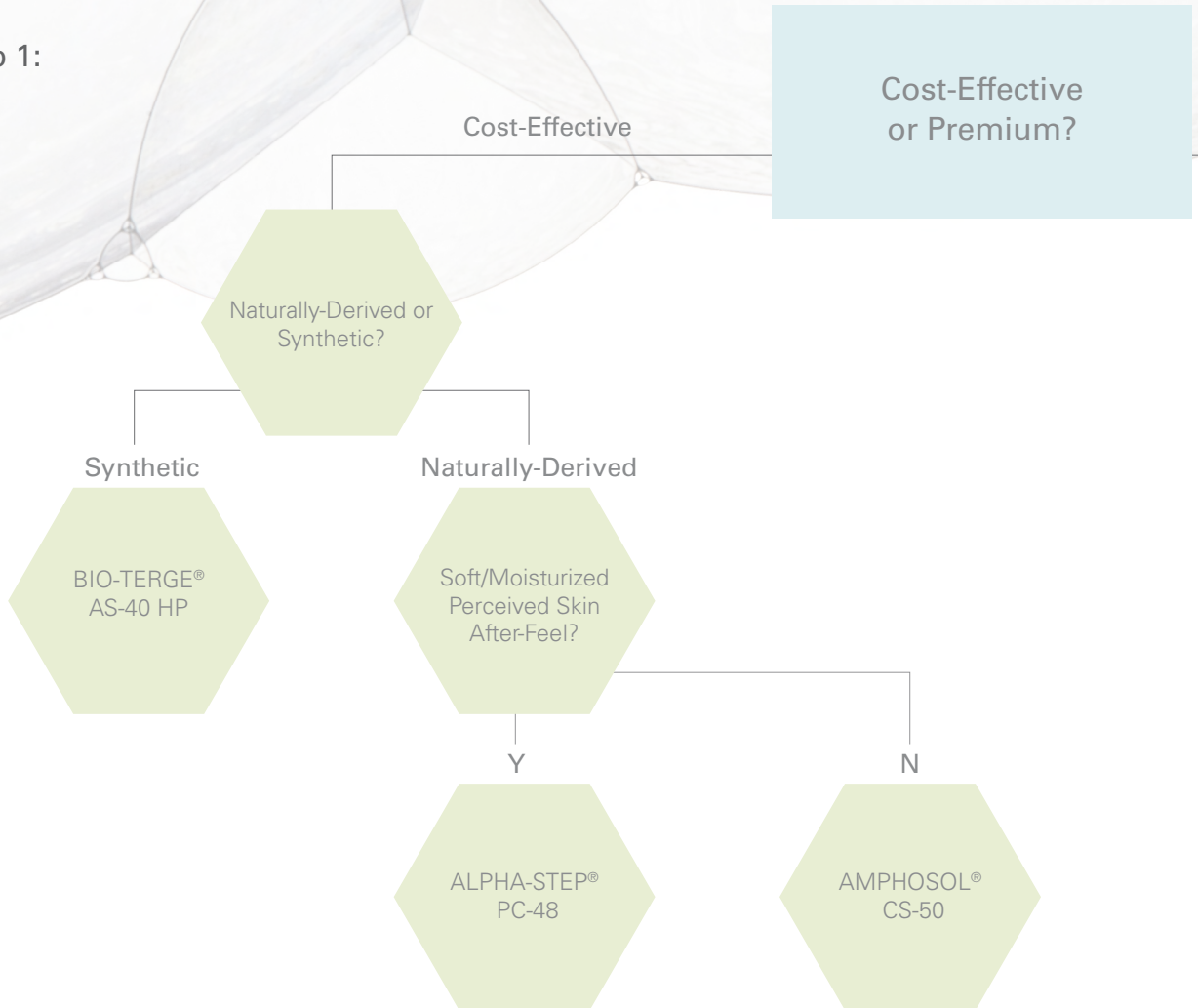
NINOL<sup>®</sup> CAA can be used in combination with betaines or other surfactants that carry small amounts of residual salt to build viscosity without requiring the addition of sodium chloride. Utilizing the multifunctionality of NINOL<sup>®</sup> CAA also eliminates the need for additional solubilizers.

NINOL<sup>®</sup> CAA is free of ethylene oxide (EO), so there is no concern for residual 1,4-dioxane. With NINOL<sup>®</sup> CAA, the resulting formulation has reduced actives and simplified ingredients along with improved foaming power and enhanced mildness.

## Choosing the Right Sulfate-Free Ingredients

Each Stepan sulfate-free ingredient offers its own set of unique attributes. Knowing how to choose the correct ingredients for an application can be confusing! Use the flowchart to help you choose a primary anionic surfactant, then check out the additional ingredients below to put the finishing touches on your formulation! Please contact a Stepan Technical Service representative in your region for guidance.

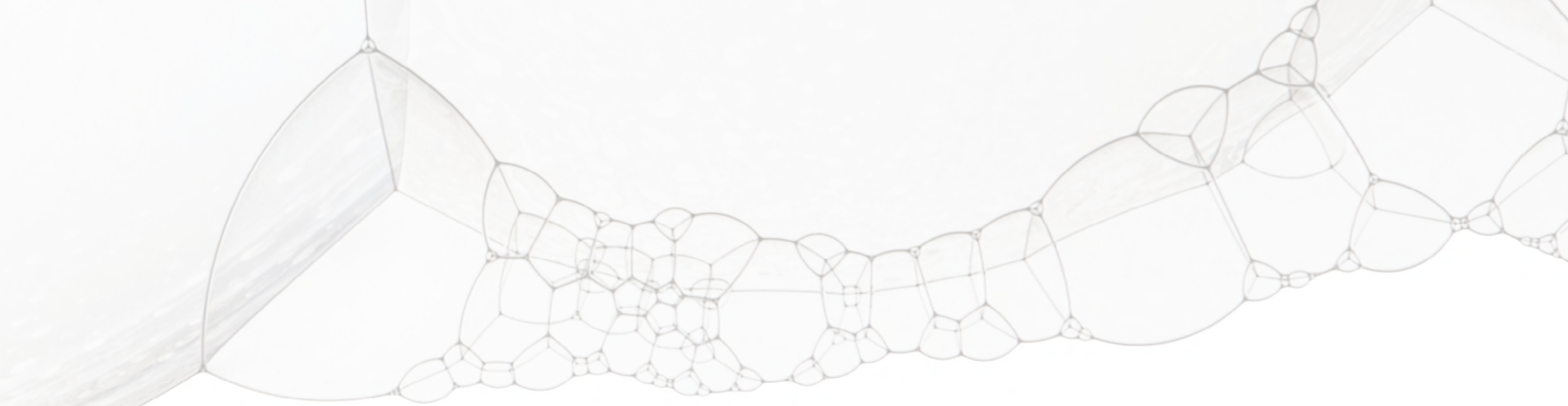
### Step 1:



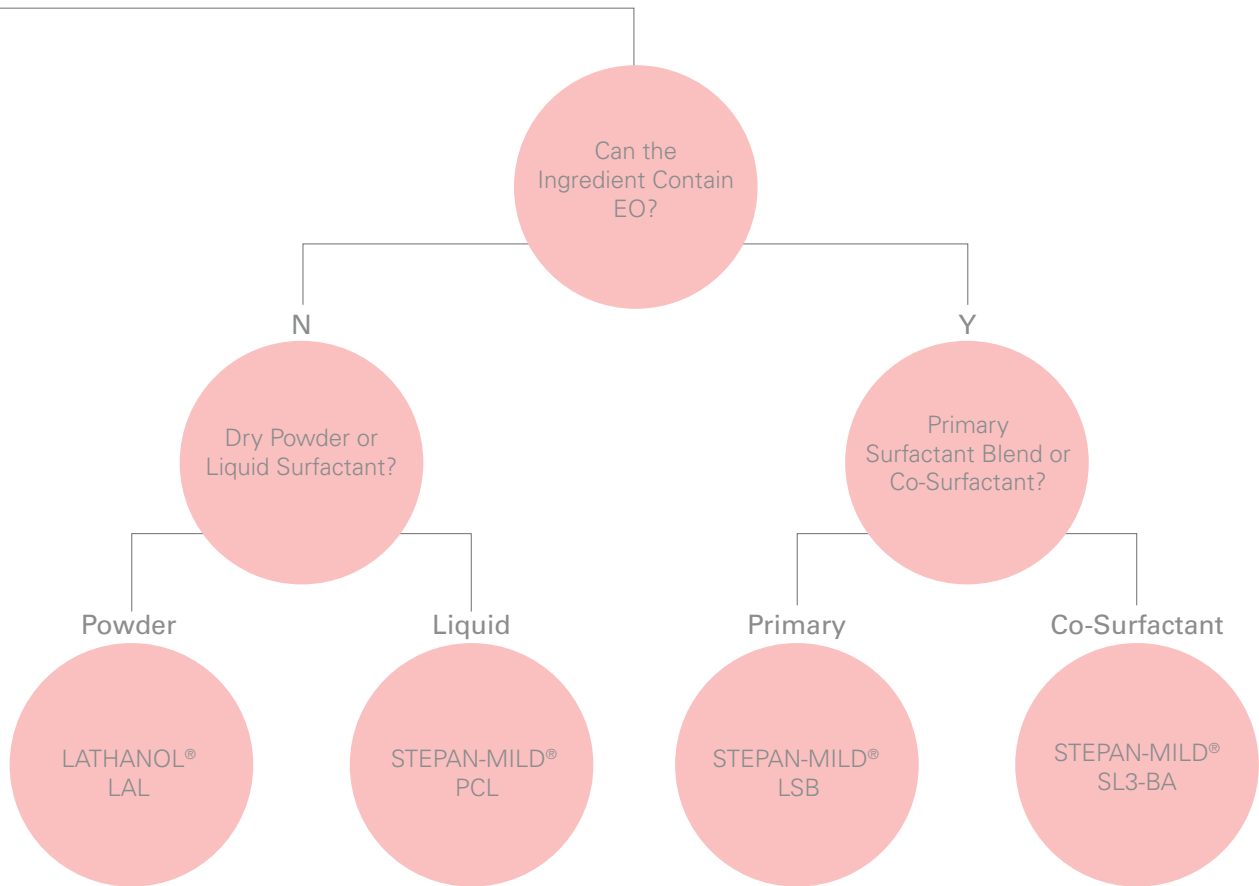
### Step 2: Boost Performance and Increase Mildness

STEPAN TRADE NAME	INCI	PROPERTIES		
		Viscosity Building	Mildness Enhancement*	Bio-Based, %
AMPHOSOL® CDB-HP	Cetyl betaine	+++	+++	78
NINOL® CAA	Dimethyl lauramide/myristamide	+++	++	86
AMPHOSOL® HCA-HP	Cocamidopropyl betaine	++	+++	64

\*Based upon average Zein score reduction when combined with anionic surfactants versus anionic surfactants alone



Premium



**Step 3:**  
Add the Finishing Touch

STEPAN TRADE NAME	INCI NAME	PROPERTIES	BIO-BASED, %
STEPAN-MILD® GCC	Glyceryl caprylate/caprinate	Emollient, foam booster	100
STEPAN-MILD® L3	Lauryl lactyl lactate	Natural silicone alternative, conditioning agent	100
NEOBEE® M-5 COSMETIC	Caprylic/capric triglyceride	Occlusive additive	100



## Finishing Off Your Sulfate-Free Formulation

Whether you are looking for sensory enhancement, conditioning effects or an enriched experience, these surfactant additives can add multifunctionality to your formulation.

# STEPAN-MILD® GCC

Sulfate-free | Soft and structured

<b>INCI Name</b>	Glyceryl Caprylate/Caprate
<b>Appearance</b>	Off-White Paste
<b>Actives</b>	100%
<b>Melting Point</b>	24-30°C
<b>Preservative</b>	None



Soft, moisturized feel  
Safe, mild, non-sensitizing and non-irritating to eyes and skin  
Enhances foam volume and feel  
COSMOS-Approved



100% Bio-based from vegetable feedstock  
Biodegradable  
No preservative



Food-grade thickener  
Able to produce structured liquid systems  
Can be incorporated at any formulation step

# STEPAN-MILD® L3

Sulfate-free | A natural silicone alternative

<b>INCI Name</b>	Lauryl Lactyl Lactate
<b>Appearance</b>	Clear Liquid
<b>Actives</b>	100%
<b>Pour Point</b>	-12°C
<b>Preservative</b>	None



Moisturized, hydrated feel  
Significantly improves skin hydration, even after 24 hours\*  
Equal performance to silicones without being "heavy"



100% Bio-based from vegetable feedstock  
Readily biodegradable  
No preservative



Comparable performance to both large and small particle size silicones  
Liquid, cold-mixable  
Boosts viscosity building

\*Compared to untreated skin

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"% Bio-Based" references the Biorenewable Carbon Index (BCI) of the material. BCI is the number of biorenewable carbons (derived from plant, animal or marine based sources) divided by the number of total carbons in the idealized molecule.

"Meets Whole Foods Market Premium Body Care Standards": Ingredients are not expressly listed on Whole Foods Premium Body Care Unacceptable Ingredients list as of December 2019.

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