Sulfate-free Color Care Technology

Stepan Prototype:

Naturally-derived, Color Care, Sulfate-free Shampoo (No. 1189)

Ingredient Name	INCI Name	% by Weight	Function
Deionized water		q.s. to 100.0	Carrier
LATHANOL® LAL Powder	Sodium lauryl sulfoacetate	6.9	Surfactant
AMPHOSOL® HCG	Cocamidopropyl betaine	12.9	Co-surfactant
AMPHOSOL® 2CSF	Disodium cocoamphodipropionate	7.0	Co-surfactant
ALPHA-STEP® PC-48	Sodium methyl 2-sulfolaurate (and) Disodium 2-sulfolaurate	7.8	Co-surfactant
STEPAN-MILD® GCC	Glyceryl caprylate/caprate	0.3	Thickener, Conditioning Agent
Citric acid		q.s.	pH Adjuster
Fragrance, Dye, and Preservative		q.s.	Additives
Total		**100.0**	

Procedure: In a suitable vessel equipped with heating and agitation capabilities, charge Deionized water. While agitating, heat to 60°C-65°C then add **LATHANOL® LAL Powder**. Mix until completely dissolved. Cool to 42°C-45°C. Add **AMPHOSOL® HCG, AMPHOSOL® 2CSF** and **ALPHA-STEP® PC-48**. Mix until homogeneous. Add **STEPAN-MILD® GCC** and mix until clear. Adjust pH with Citric acid, if necessary. Add Fragrance, Dye, and Preservative while mixing.

Typical Properties:

Appearance at 25°C	Clear liquid
Viscosity at 25°C, cps	12,000
pH, as is	5.8-6.0
Total Actives, %	14.8
Total Solids, %	19.2

Formulation Highlights:

Color Fade Resistance: Provides perceivable color fade resistance demonstrated in different coloring systems.

Foaming Performance: Foam volume in salon testing noticeably exceeds an Anti-Fade Market Leader Shampoo (industry performance benchmark) at significantly lower solids (19% vs. 32%).

Hair Conditioning: Parity in all attributes to the Anti-Fade Market Leader Shampoo in salon testing.

Formulation Attributes:

- Sulfate-free
- Amide-free
- Mild
- EO/PO-free→1,4-Dioxane-free
- Naturally-derived*

Hair Color Retention

After 20 Salon Washes

1. Unwashed
2. Commercial Clarifying Shampoo
3. Anti-Fade Market Leader Shampoo
4. Commercial Mild Baby Shampoo
5. **Stepan Prototype**

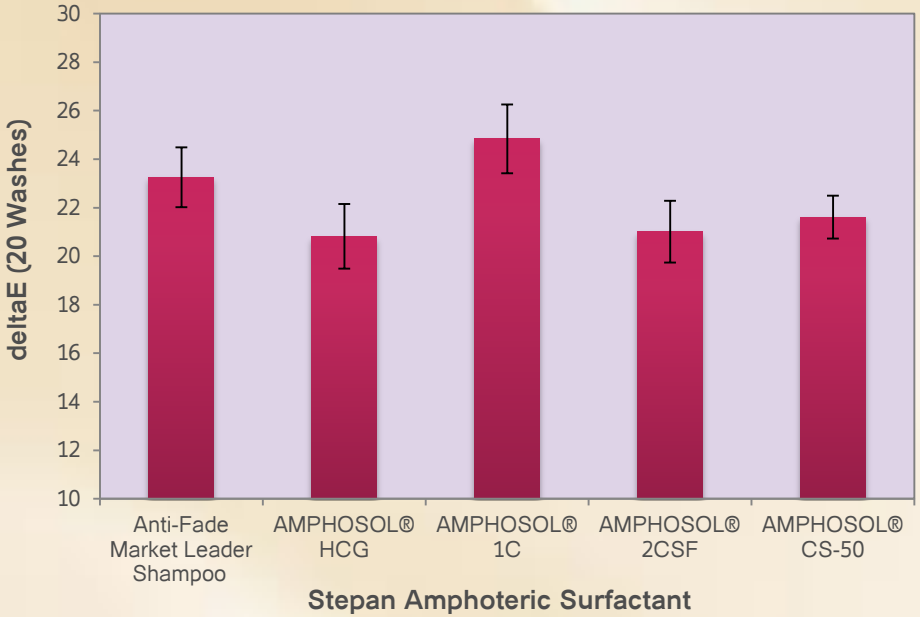
* For more information on terminology please contact Stepan U.S. Technical Service at 1-800-745-7837 or techserv@stepan.com

Color Retention

Effect of Amphoteric Surfactants

Hair Tress Measurement Prototype:

LATHANOL® LAL Powder (4.85% actives), **ALPHA-STEP® PC-48** (2.88% actives), **STEPAN-MILD® GCC** (0.50 % actives), and Stepan Amphoteric Surfactant (6.76% actives) with equal actives replacement of the Stepan Amphoteric Surfactant compared to the Anti-Fade Market Leader Shampoo



The number reflects the average deltaE for 10 samples. The lower the value, the less color loss.

AMPHOSOL® 1C showed the most color fading, followed by the Anti-Fade Market Leader Shampoo.

All other prototypes demonstrated equal color retention, outperforming the Anti-Fade Market Leader Shampoo, indicating that the amphoteric surfactants noted are interchangeable without an impact to color retention.

Shampoo Performance Property Comparison

Salon half head performance comparisons.

Ranking: 0 - Parity; 1 - Slightly better; 2 - Noticeably better

Legend

Stepan Product	INCI Name
STEPAN-MILD® GCC	Glyceryl caprylate/caprate
LATHANOL® LAL Powder	Sodium lauryl sulfoacetate
AMPHOSOL® HCG	Cocamidopropyl betaine
AMPHOSOL® CS-50	Cocamidopropyl hydroxysultaine
AMPHOSOL® 2CSF	Discodium cocoamphodipropionate
AMPHOSOL® 1C	Lauryl amphoacetate
ALPHA-STEP® PC-48	Sodium methyl 2-sulfolaurate (and) Disodium 2-sulfolaurate

©2013 Stepan Company. All rights reserved.

Disclaimer: Nothing contained herein grants or extends a license, expressed or implied, in connection with patents, issued or pending, of the manufacturer or others. The information contained herein is based on the manufacturer's own study and the work of others. The manufacturer makes no warranties, expressed or implied, as to the accuracy, completeness, or adequacy of the information contained herein. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS ADEQUACY OR FURNISHING OF SHUCH INFORMATION.

ALPHA-STEP®, AMPHOSOL®, LATHANOL®, and STEPAN-MILD® are registered trademarks of Stepan Company.

Stepan

Innovative Chemical Solutions for a Cleaner, Healthier, More Energy Efficient World