Stepan

Formulation

Name

PREMIUM PLANT-BASED 2X LAUNDRY DETERGENT

No. 1137

Description

This 2X heavy-duty liquid (HDL) uses surfactants listed on CleanGredients.org or ingredients known to be used in Safer Choice-approved formulations. The formulation cleans within the high end of the "green" 2X commercial HDL range and contains surfactants that are plant-derived. Instructions on how to create a high efficiency (HE) version of this formulation are included below.

Formulation

INGREDIENTS:	% by Weight	Functionality
ALPHA-STEP® PC-48	43.59	Surfactant
BIO-SOFT® EC-690	16.67	Surfactant
AMMONYX® LMDO	2.27	Secondary Surfactant
Hardened Coconut Fatty Acid	1.00	Foam Modifier
Sodium Hydroxide (50% aqueous solution)	3.50	Neutralizer
Borax Pentahydrate	1.90	Stabilizer, Buffer
Glycerol	3.00	Stabilizer
Citric Acid (50% aqueous solution)	4.00	Builder, Buffer
Protease	0.90	Enzyme
Amylase	0.45	Enzyme
Deionized Water, Fragrance, Colorant and Preservative	q.s. to 100	Additives
Total	**100.00**	

Procedure

1. Charge Deionized Water (50% of the calculated total required amount) at 140ºF (60ºC) and start agitation. Keep agitation going until batch is complete.
2. Add Citric Acid with mixing and wait until dissolved. This should only take a short time.
3. Add Borax Pentahydrate with mixing and wait until dissolved. This should only take a short time.
4. Add Glycerol with mixing.
5. Add Hardened Coconut Fatty Acid with mixing. Fatty Acid is added molten and will turn the batch cloudy when added.
6. Add 75% of the Sodium Hydroxide charge. When added, the Fatty Acid gels slightly, but dissolves. After a short time, batch will become clear.
7. Slowly add ALPHA-STEP® PC-48 with mixing.
8. Add BIO-SOFT® EC-690 with mixing.
9. Add AMMONYX® LMDO with mixing.
10. Adjust pH with Sodium Hydroxide. The target pH range is 8.5 to 9.0, with a specific target of 8.8.
11. Once batch has cooled to 90ºF (32ºC) or below, add Preservative, Enzymes, Colorant, and Fragrance with mixing.
12. Add required amount of Deionized Water to complete batch with mixing.
13. Run final pH check. If pH is below 8.5, adjust into target range with Sodium Hydroxide. If pH is above 9.0, adjust into target range with Hydrochloric Acid.

HIGH EFFICIENCY (HE) VERSION: Use 3% more Hardened Coconut Fatty Acid (for a total of 4%) in Step 5 and use 1.11% more Sodium Hydroxide in Step 6 for a grand total of 2.11% of 50% Sodium Hydroxide, including both Steps 6 and 10.

Physical Properties	Appearance at 25ºC	Clear liquid
	pH, as is	8.5 - 9.0 (Target 8.8)
	Viscosity at 25ºC, cps	250 - 500
Storage/ Stability	3 Freeze/thaw Cycles	Pass
	4 weeks at 5ºC	Pass
	4 weeks at RT	Pass
	4 weeks at 40ºC	Pass

Instructions for Use

32 loads/50 fl. oz bottle = 1.56 fl. oz/load
HE = 32 loads/50 fl. oz bottle

External Comment

Marketing Notes: ALPHA-STEP® PC-48, BIO-SOFT® EC-690, and AMMONYX® LMDO are approved ingredients on www.cleangredients.org. For further information, visit www.stepan.com or www.cleangredients.org. This core formulaulation should be able to be used to create a final formula capable of receiving a Safer Choice certification. Customer would need to carefully choose colorant, fragrance, and preservative ingredients that would be compatible with DfE requirements. Customer is responsible for obtaining Safer Choice approval on final formulation. Use of the term "green" on the finished product or label is at the sole risk of the finished product manufacturer, for which Stepan bears no responsibility. Label and/or trademark usage of the final product is the sole responsibility of the finished product manufacturer.

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ALPHA-STEP®
AMMONYX®
BIO-SOFT®

For Additional Assistance

For applications or product handling assistance, call our Technical Service Department at 1-800-745-7837 (U.S.) or 011-334-76-505-100 (Europe).
For ordering assistance, call our Account Service Department at 1-800-457-7673.

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