



# Formulation

Name	<b>PREMIUM 2X LIQUID LAUNDRY DETERGENT</b>		
No.	1134		
Description	This premium 2X heavy-duty liquid (HDL) demonstrates cleaning performance within the high-end range of commercial 2X HDLs. Instructions on how to create high efficiency (HE), bleaching action, and softergent versions from this formula are provided below.		
Formulation	<b>INGREDIENTS:</b>	<u>% by Weight</u>	<u>Functionality</u>
	BIO-SOFT® S-101	10.52	Surfactant
	STEOL® CS-460	11.67	Surfactant
	BIO-SOFT® EC-690	16.67	Surfactant
	STEPANATE® SXS	3.75	Hydrotrope
	Hardened Coconut Fatty Acid	1.00	Foam Modifier
	Sodium Hydroxide (50% aqueous solution)	4.10	Neutralizer
	Borax Pentahydrate	1.90	Stabilizer
	Propylene Glycol	1.50	Stabilizer
	Citric Acid (50% aqueous solution)	3.30	Builder
	Triethanolamine	0.53	Buffer
	Monoethanolamine	0.53	Buffer
	Fluorescent Whitening Agent	0.16	Brightener
	Protease	0.90	Enzyme
	Amylase	0.45	Enzyme
	Deionized Water, Fragrance, Colorant, and Preservative	q.s. to 100	Additives
	<b>Total</b>	<b>100.00</b>	
Procedure	<ol style="list-style-type: none"> <li>Charge 140°F (60°C) water (50% of the calculated total required) and start agitation. Keep agitation going until batch is complete.</li> <li>Add Fluorescent Whitening Agent. Mix for at least 30 minutes if Whitener is a powder.</li> <li>Add Citric Acid and wait until dissolved.</li> <li>Add Borax Pentahydrate and wait until dissolved.</li> <li>Add Propylene Glycol with mixing.</li> <li>Add Monoethanolamine with mixing.</li> <li>Add Triethanolamine with mixing.</li> <li>Add Hardened Coconut Fatty Acid with mixing. The Fatty Acid should be added "molten" and will turn the batch cloudy when added.</li> <li>Add 75% of the Sodium Hydroxide charge with mixing. Fatty Acid gels slightly, but dissolves. After a short time, batch will become clear.</li> <li>Slowly add BIO-SOFT® S-101 with mixing. The batch will thicken a bit.</li> <li>Add BIO-SOFT® EC-690 with mixing.</li> <li>Add STEOL® CS-460 with mixing.</li> <li>Add STEPANATE® SXS with mixing.</li> <li>Adjust pH with Sodium Hydroxide (pH target range is 8.5 to 9.0, with a specific target of 8.8).</li> <li>Once batch has cooled to 90°F (32°C) or below, add Preservative, Enzymes, Colorant, and Fragrance with mixing.</li> <li>With mixing, add the remainder of required amount of Deionized Water to complete batch.</li> <li>Run final pH check. If pH is below 8.5, adjust into target range with Sodium Hydroxide. If pH is</li> </ol>		

above 9.0, adjust into target range with BIO-SOFT® S-101.

A. HIGH-EFFICIENCY (HE) VERSION: Use 3% more hardened Coconut Fatty Acid (for a total of 4%) in Step 8 and use 1.11% more Sodium Hydroxide in Step 9 (for a total of 4.71% of 50% Sodium Hydroxide including both Steps 9 and 14).

B. BLEACHING ACTION VERSION: Use 50% more Fluorescent Whitening Agent (for a total of 0.24%) in Step 2.

C. SOFTERGENT VERSION: Add 0.7% ACCOSOFT® 365 after Step 13.

Physical Properties

Appearance at 25°C  
pH, as is  
Viscosity at 25°C, cps

Clear liquid  
8.5–9.0 (Target 8.8)  
200–400

Storage/  
Stability

3 Freeze/Thaw Cycles  
4 Weeks at 5°C  
4 Weeks at Room Temperature  
4 Weeks at 40°C

Pass  
Pass  
Pass  
Pass

Instructions  
for Use

32 loads/50 fl. oz. bottle = 1.56 fl. oz./load  
HE = 32 loads/50 fl. oz. bottle  
Bleaching = 26 loads/50 fl. oz. bottle  
Softergent = 26 loads/50 fl. oz. bottle

External  
Comment

Marketing Notes: BIO-SOFT® S-101 and BIO-SOFT® EC-690 are approved ingredients on [www.cleangredients.org](http://www.cleangredients.org). For further information, visit [www.stepan.com](http://www.stepan.com) or [www.cleangredients.org](http://www.cleangredients.org).

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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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