

# Formulation

Name	<b>ECONOMY "GREEN" 2X LIQUID LAUNDRY DETERGENT</b>	
No.	1138	
Description	2X heavy-duty liquid (HDL) using only surfactants which are listed on Cleangredients.org or ingredients that are known to be used in DfE approved formulations. The formula cleans within the lower end of the "green" 2x HDL range. Instructions on how to create a high efficiency (HE) version of this formula is provided below.	
Formulation	<u>INGREDIENTS:</u>	<u>% by Weight</u> <u>Functionality</u>
	ALPHA-STEP® PC-48	12.82 Surfactant
	BIO-SOFT® EC-690	5.56 Surfactant
	Citric Acid (50% aqueous solution)	4.00 Builder, Buffer
	Sodium Hydroxide (50% aqueous solution)	2.50 Neutralizer
	Cellulose-based Polymeric Thickener	0.40 Thickener
	Deionized Water, Colorant, Fragrance, Preservative	q.s. to 100 Additives
	<b>Total</b>	<b>100.00</b>
Procedure	<ol style="list-style-type: none"> <li>1. Charge 140°F (60°C) water (50% of the calculated total required) and start agitation. Keep agitation going until batch is complete.</li> <li>2. Add Citric Acid and wait until dissolved. (This should only take a short time.)</li> <li>3. Add Sodium Hydroxide.</li> <li>4. Add Cellulosic Thickener. Mix for 10 minutes (or until thickener is fully dissolved).</li> <li>5. Add ALPHA-STEP® PC-48.</li> <li>6. Add BIO-SOFT® EC-690.</li> <li>7. Once batch has cooled to 90°F (32°C) or below, add Colorant, Fragrance and Preservative with mixing.</li> <li>8. Add required amount of Deionized Water with mixing to complete batch.</li> <li>9. Run final pH check. If pH is below 7.0, adjust into target range with Sodium Hydroxide. If pH is above 7.5, adjust into target range with Hydrochloric Acid.</li> </ol> <p>A. HIGH EFFICIENCY VERSION: Add 2% hardened coconut fatty acid after Step 2 and use 0.74% more Sodium Hydroxide in Step 3 (for a total of 3.24% of 50% Sodium Hydroxide in Step 3).</p>	
Physical Properties	Appearance at 25°C	Clear liquid
	pH, as is	7.0–7.5 (Target 7.2)
	Viscosity at 25°C, cps	150–350
Storage/ Stability	3 Freeze/Thaw Cycles	Pass
	4 Weeks at 5°C	Pass
	4 Weeks at Room Temperature	Pass
	4 Weeks at 40°C	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 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). This core formula should be able to be used to create a final formula capable of receiving a DfE certification. Customer would need to carefully choose colorant, fragrance, and preservative ingredients that would be compatible with DfE requirements. Customer is responsible for obtaining DfE 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.

Registered  
Trademarks  
of Stepan  
Company

ALPHA-STEP®  
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.

The information contained herein is based on the manufacturer's own study and the works of others and is subject to change without prior notice. The information is not intended to be all-inclusive, including as to the manner and conditions of use, handling, storage or disposal or other factors that may involve additional legal, environmental, safety or performance considerations. Nothing contained herein grants or extends a license, express or implied, in connection with any patents issued or pending of the manufacturer or others, or shall be construed as a recommendation to infringe any patents. **STEPAN COMPANY MAKES NO PRODUCT WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR USE, EXPRESS OR IMPLIED, AND NO OTHER WARRANTY OR GUARANTY, EXPRESS OR IMPLIED, IS MADE, INCLUDING AS TO INFORMATION REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY, ACCURACY, COMPLETENESS, OR ADEQUACY.** Stepan Company (and its employees, subsidiaries and affiliates) shall not be liable (regardless of fault) to the vendee, its employees, or any other party for any direct, indirect, special or consequential damages arising out of or in connection with the accuracy, completeness, adequacy, furnishing, use, or reliance upon information provided herein. The vendee assumes and releases Stepan Company (and its employees, subsidiaries and affiliates) from all liability, whether in tort, contract or otherwise to the fullest extent possible under the relevant law.

**Stepan** 

Stepan Company  
Northfield, Illinois 60093  
Telephone (847) 446-7500

Revision Date: 10/08/2010    Publication Date:    © 2016, Stepan Company. All rights reserved.