



# Formulation

Name **HOUSEHOLD AUTOMATIC DISHWASH DETERGENT--PHOSPHATE-FREE**

No. 1169

Description This is a phosphate- and bleach-free dishwasher detergent for consumer use.

Formulation **INGREDIENTS:** % by Weight Functionality

=== Phase 1 ===

Deionized Water	74.81	Solvent
Natrosol 250 HBR (Hercules), Hydroxyethylcellulose	0.75	Thickener

=== Phase 2 ===

Sodium Bicarbonate	7.00	Builder
Sodium Citrate	3.00	Builder
BIO-TERGE® PAS-8S	2.50	Primary Surfactant
BIO-SOFT® N1-5	0.50	Emulsifier
BIO-SOFT® N91-2.5	0.25	Defoamer
Propylene Glycol	3.00	Stabilizer
Trilon M (BASF), Methylglycinediacetic Acid, tri-sodium salt	5.00	Chelating Agent
Borax Pentahydrate	1.76	Stabilizer
Calcium Chloride	0.05	Stabilizer

=== Phase 3 ===

Properase 1600L (Genencor), Protease Enzyme	1.00	Enzyme
Purastar HPAM 5000L (Genenvor), Amylase Enzyme	0.30	Enzyme
Neolone M10 (Dow)	0.08	Preservative

**Total** 100.00

Procedure 1. Charge tank with Deionized Water. Add Natrasol 250 HBR. Heat mixture to 40°C (104°F), mixing until lumps disappear. Remove from heat allowing mixture to cool.  
2. Add ingredients in the order listed above. Mix until homogenous.  
3. Continue to cool until solution temperature is below 30°C (86°F). Add Enzymes and Preservative. Mix until homogenous.

Physical Properties	Appearance at 25°C (77°F)	Clear gel
	Viscosity at 25°C (77°F), cps	1,500
	pH (as is)	9.0
	Solids, %	17.70

Storage/Stability	3 months at 30°C (86°F)	Stable
	4 weeks at 25°C (77°F)	Stable
	4 weeks at 4°C (38°F)	Stable
	Freeze/Thaw, 3 Cycles	Stable

Instructions for Use Fill detergent dispenser using amount as indicated in manufacturer's instructions.

This formula showed improved performance over commercially available DfE-certified products and equal performance to leading commercial non-DfE products based on ASTM D 3556-85

External  
Comment

method for spotting and filming.

Marketing Notes: BIO-TERGE® PAS-8S and BIO-SOFT® N1-5 are approved ingredients on [www.cleangredients.org](http://www.cleangredients.org). For further information, visit [www.cleangredients.org](http://www.cleangredients.org) or [www.stepan.com](http://www.stepan.com) (Stepan's website). Trilon M (BASF) is an approved ingredient on [www.cleangredients.org](http://www.cleangredients.org). This formula is designed for use in all household automatic dishwashers.

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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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Revision Date: 09/25/2014    Publication Date: 10/05/2011    © 2014, Stepan Company. All rights reserved.