



Zemea[®] Liquid Laundry Detergent

Performance Evaluation

Ingredient	Wt.%
C12-C13 Linear Alcohol EO-7	4.0%
Linear Dodecyl Benzene Sulfonate (60%)	14.0%
Sodium Laureth Sulfate (60%)	5.0%
Sodium Citrate	4.0%
Sodium Borate	4.0%
Zemea[®] propanediol	3.0%
Tinopal CBS-X	0.1%
Protese	0.7%
Amylase	0.2%
Monethanolamine	0.5%
Coconut Fatty Acid (C12-C18)	2.0%
Water	62.5%
Total	100.0%

Physical Properties

pH, as is	8.5
Soluble Solids, 5 by refractometer	29.3
Residue on Drying, % by wt.	28
Viscosity, cPs @ 25°C	194
Visul Viscosity	Water / Thin
Freeze/Thaw Stability (-15°/25°C)	Pass
Heat Stability (50°C), 30 days	Pass

Performance Evaluation

Soil and stain removal of a Zemea[®] propanediol detergent formulation and a similar propylene glycol detergent formulation were tested using cotton and cotton/polyester swatches. The standard soiled swatches were laundered under computer controlled laboratory test conditions. The swatches were read before and after laundering using a Hunter Colorimeter to calculate cleaning efficacy (% soil removed).

Soiled & Stained Cloths

- Dust / Sebum
- Spagetti Sauce
- Cosmetic Make-up
- Blood / Milk
- Ink
- Coffee
- Cocoa
- Grass
- Clay
- Motor Oil
- Grape Juice

Conclusion

Zemea[®] propanediol can be successfully substituted for glycols in a laundry detergent formulation.

Zemea[®] propanediol formulations demonstrated comparable physical and performance (including soil and stain removal) properties.

Zemea[®] propanediol formulations were stable to freeze/thaw and evaluated temperature (50°C) storage.