



Zemea[®] Liquid Laundry Detergent Performance Evaluation

| Wt.% |
|-------------|
| 4.0% |
| 14.0% |
| 5.0% |
| 4.0% |
| 4.0% |
| 3.0% |
| 0.1% |
| 0.7% |
| 0.2% |
| 0.5% |
| 2.0%% |
| 62.5% |
| 100.0% |
| |

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

• Ink

Cocoa

Grass

Dust / Sebum

Blood / Milk

Cosmetic Make-up

- Spagetti Sauce Coffee
- Clay
 - Motor Oil
 - Grape Juice

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 |
| Visusl Viscosity | Water / Thin |
| Freeze/Thaw Stability (-15º/25ºC) | Pass |
| Heat Stability (50°C), 30 days | Pass |

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.

COVATIONBIO PDO

For additional information or samples, please contact Customer Service.

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