TECHNICAL DATA SHEET

Flexisperse™ 450

Detergent polymer

Overview

- Aqueous, partially neutralized sodium polyacrylate
- Multi-Functional ingredient enhances the performance and efficiency of cleaning formulations
- Sequesters hardness ions allowing for optimum surfactant performance
- Delivers excellent crystal growth inhibition, anti-encrustation, and anti-redeposition of particulate soil
- Stable builder in high alkaline/bleach Industrial & Institutional cleaners
- Allows the end user to receive product at the highest % actives while conforming to DOT regulations
- Used in the manufacturing/processing of powdered laundry detergents as a slurry viscosity reducer, dispersing agent and powder structurant.

Applications

- Co-Builder in Household and Institutional powder laundry detergents
- Performance additive for Auto Dish formulations
- Formulary additive for hard surface, bottle wash, ware washing and other I&I cleaning formulation applications
- Textile sour additive for dyeing and finishing of textiles
- General purpose dispersant for inorganic pigments and fillers including $CaCO_3$ and TiO_2

Technical Information

Flexisperse 450 is a partially neutralized sodium polyacrylate homopolymer sequesterant, dispersant, deflocculant and rheology modifier, optimized with an average molecular weight of 4000-5000 for use in warewashing, fabric wash and commercial detergent formulations.

Specifically designed for use in detergent formulations as a soil dispersant, anti-redeposition agent and hard water ion sequestrant, Flexisperse 450 is effective at slowing the build-up of fats and proteins on surfaces, increasing the solubility of precipitating salts, and at inhibiting crystal growth to prevent the formation of scale and hard water deposits.

With high caustic and hypochlorite stability, and the ability to bind destabilizing metals and reduce filming on surfaces, Flexisperse 450 is ideal for use as a soil dispersing and anti-soil redeposition agent in powdered warewash and CIP cleaning formulations.

Formulary

Typically added to formulations at 2-4% actives, the anionic character of the polymer serves to prevent the redeposition of particulate soil onto the washed garment and retards the encrustation of $CaCO_3$ from soda ash built formulations.

See Flexisperse 450ND as a high actives spray dried version, and 450N as a fully neutralized version.

Typical Properties

PROPERTY	VALUE
Appearance	Clear to slightly hazy liquid
Color	Colorless to pale amber
Odor	Mild
Ionic character	Anionic
Water solubility	Soluble
Average molecular weight (Mw)	4,000-5,000
Viscosity @25°C (Brookfield), MPa·s/cps	400-1200
Total solids, %	50.0±1.0
pH (as is)	4.0±0.5
Density@25°C, g/ml	1.3±0.1
Boiling Point	100°C
Flash point	None (aqueous)
Storage	Stable to freezing
Shelf life	12 months

Packaging and Handling

Flexisperse 450 is available in:
Bulk (44,000 lbs)
275 gallon totes (Net Wt. 2750 lbs)
55 gallon plastic drums (Net Wt. 550 lbs)

Refer to the Safety Data Sheet (SDS) for information on the safe use, handling, and disposal of this product.

DOT Classification: Non-Regulated

Whether you're looking for a replacement product or an ingredient for a specific attribute, give us a call. We can provide assistance based upon your particular formulation requirements and composition; please feel free to contact us.

Please refer to back page for important information

Flexisperse 450
Formulation guidance

Clean-In-Place formulations
When formulated into Clean-In-Place cleaning formulations, Flexisperse 450 reduces surface filming by slowing the build-up of fats and proteins on surfaces, increasing the solubility of precipitating salts, and by inhibiting crystal growth to prevent the formation of scale and hard water deposits.

With high caustic and hypochlorite stability, and ability to disperse inorganic particles, Flexisperse 450 is ideal for use as a soil dispersing and anti-soil redeposition agent in warewash and CIP cleaning formulations.

Laundry formulations
This polymer was originally used as a production assist that allowed producers to disperse and feed higher solid slurries to the spray dryer, optimizing throughput and energy consumption. Legislation that reduced and ultimately eliminated Sodium Phosphates in detergents led to reformulation of many laundry formulations to a zeolite/polyacrylate co-builder system for which the Flexisperse 450 was optimized. The combination of molecular weight and molecular weight distribution is designed for the effective sequestration of hardness ions in the wash water, allowing the surfactants in the cleaning formulation to work optimally.

The use of Flexisperse 450 will enhance the cleaning properties (clay soil removal) of laundry detergents based on both zeolite/soda ash and phosphate. The cleaning performance of any laundry detergent is inversely related to water hardness, and the use of a dispersant polymer such as Flexisperse 450 will help to offset the effect of the hardness.

Flexisperse dispersant polymers have the ability to reduce calcium carbonate deposition (encrustation) on laundry during the wash cycle. Even with very hard water (300 ppm calcium), adding 1 percent of Flexisperse 450 to a soda ash-based detergent will virtually eliminate encrustation.

To obtain an optimal effectiveness, Flexisperse 450 can be used in phosphate based or phosphate free detergents (carbonate, silicate, citrate or NTA-based) at levels between 250 and 1000 ppm in the wash baths for household applications and 100 to 500 ppm for institutional applications.

Example formulations

Commercial Warewash Gel	
Ingredient	**Wt. %**
Water	to 100
Carbopol 672	0.5
Potassium Hydroxide, 45%	10.0
Sodium Hydroxide, 50%	30.0
Sodium Tripolyphosphate, Anhydrous	15.0
Sodium AOS, 40%	1.5
Flexisperse 450	6.0
Sodium Hypochlorite, 12.5%	18.0
Charge Carbopol to water with mixing to uniform dispersion. Charge remaining ingredients in order listed.	

Grease Releasing Liquid Laundry Concentrate	
Ingredient	**Wt. %**
Water	to 100
Sodium carbonate (soda ash)	1.0
Sodium AOS, 40%	8.0
C11 alcohol, 7 mole ethoxylate	8.0
C9-11 alcohol, 6 mole ethoxylate	2.0
Flexisurf LDP	9.0
Flexisperse 450	2.0
Tinopal CBS-X	0.2
Triethanolamine/Citric acid	q.s.
Ethanol	q.s.
Dye, fragrance	q.s.
Charge ingredients in order listed. Adjust pH to 8-9 with triethanolamine or citric acid, reduce viscosity with ethanol	