



# Flexisperse™ 450ND

Detergent polymer spray-dried powder

## Overview

- Spray-dried powder, fully 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  $\text{CaCO}_3$  and  $\text{TiO}_2$

## Technical Information

Flexisperse 450ND is a fully 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 sequesterant, Flexisperse 450ND 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 450ND 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  $\text{CaCO}_3$  from soda ash built formulations.

See Flexisperse 450N as a fully neutralized liquid version, and 450 as a partially neutralized liquid version.

## Typical Properties

PROPERTY	VALUE
Appearance	Powder
Color	White to pale amber
Odor	Mild
Ionic character	Anionic
Water solubility	Soluble
Average molecular weight (Mw)	4,000-5,000
Total solids, %	minimum of 88%
pH (10% aq.)	7.0±1.0
Bulk Density, g/cc	0.9±0.1
Shelf life	12 months

## Packaging and Handling

Flexisperse 450ND is available in:  
Bags (Net Wt. 50 lbs)

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

DOT Classification: Non-Regulated

This dried product may take on moisture when exposed to a humid environment. In order to limit moisture absorption prior to use, the packages need to remain tightly closed and completely wrapped in plastic when possible.

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 450ND

## Formulation guidance

### Clean-In-Place formulations

When formulated into Clean-In-Place cleaning formulations, Flexisperse 450ND 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 450ND 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 450ND 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 450ND 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 450ND 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 450ND to a soda ash-based detergent will virtually eliminate encrustation.

To obtain an optimal effectiveness, Flexisperse 450ND 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 450ND	4.0
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 450ND	1.0
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	

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