

## Product Data

NUMBER 4146  
(Supersedes 401-11)

### NATROSOL® 250 Hydroxyethylcellulose A Nonionic Water-Soluble Cellulose Ether

NATROSOL® 250 hydroxyethylcellulose (HEC), a nonionic water-soluble polymer, is a white, free-flowing granular powder. Natrosol 250 is insoluble in organic solvents, yet it is easily dispersed in cold or hot water to give solutions of varying viscosities. Chemically, it is cellulose that has been etherified with hydroxyethyl groups to give the desired properties.

Natrosol 250 is used as a thickener, protective colloid, binder, stabilizer, and suspending agent, particularly in applications where a nonionic material is desired. The HH type is the most efficient nonionic thickener available. All viscosity types are obtainable in easy-dispersing form, designated R (e.g., 250 HHR). These R materials have been treated to delay hydration of the particle and thus prevent lumping as the dry powder is added to water. Natrosol B grade (e.g., 250HBR) with improved resistance to biological degradation is also available.

Natrosol 250 *NF* grades are available for pharmaceutical applications. Typical pharmaceutical uses include tablet binding, sustained release, and solids suspension. High-purity grades of Natrosol, designated as CS grade, are also recommended for cosmetics applications such as thickening shampoos, conditioners, liquid soaps, and shaving creams.

#### Typical Properties

Viscosity Type	Solution Viscosity (Brookfield at 25°C, cps)		
	1%	2%	5%
HH	3,400-5,000	—	—
H4	2,600-3,300	—	—
H	1,500-2,500	—	—
MH	800-1,500	—	—
M	—	4,500-6,500	—
K	—	1,500-2,500	—
G	—	150-400	—
E	—	25-105	—
J	—	—	250-400
L	—	—	75-150

(over)

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All viscosity types have the following typical properties. (The higher purity CS and NF grades have more stringent specifications.):

Ash (calculated as Na <sub>2</sub> SO <sub>4</sub> ), %, max	5.5
pH (2% solution)	6.0-8.5
Color	white to light tan
Moisture (as packed), %, max	5
Particle size	
Passing U.S. No. 40 mesh, %, min	90

### Outstanding Characteristics

White, granular material that disperses and dissolves readily in water to give clear, smooth, nonthixotropic solutions; nonionic and unaffected by high concentrations of soluble salts in solution. Its viscosity is little affected by mild acids and alkalies, and it has good anaerobic burnout properties.

*Soluble* in cold or hot water up to practical viscosity limits. Has improved tolerance for aqueous-alcohol systems and is solvated by some such systems. Insoluble in and inert to all common nonaqueous organic solvents. *Insolubilized* by certain resins and reagents.

*Has wide compatibility* with natural and synthetic gums and with resin and latex emulsions.

*Packaged* in foil-lined, multiwall 50-lb bags, 40 bags per pallet, stretch-wrapped and capped.

### Typical Uses

Natrosol® 250 hydroxyethylcellulose has been developed as a uniform, high-efficiency, nonionic, water-soluble polymer. Its uses include the following:

*As a thickener* in latex paints, paper coatings, latex emulsions, cosmetics and toiletries, coatings, textile printing pastes and inks, and adhesives.

*As a protective colloid* in vinyl-type polymerization reactions, pigment dispersions, electroplating solutions, and cosmetics.

*As a binder* in ceramic colors, glazes, refractory compositions, colored pencil leads, burnout-type binders, patching plasters, and tile adhesives.

*As a surface coating* for textile warp and finish sizing, glass fiber sizing, and paper sizing and treating for absorbency, greaseproofness, and transparency.

*In acid thickening* for acidizing oil wells, for acid-fracturing rock formations, in metal cleaners, and in surface treatments.

*In water-loss control* with Portland cement in oil well cements, thin-set tile mortars, and other applications to prevent loss of water to porous strata and surfaces.

*Note:* Although Natrosol 250 is more resistant to microbiological degradation than natural gums and colloids, it is recommended that a water-soluble preservative be added if solutions are to be stored.

**FDA Status**

Natrosol 250HEC is in compliance with requirements of the U.S. Food and Drug Administration for use in materials contacting foods as specified in the Code of Federal Regulations, Title 21, subject to the limitations and requirements of each regulation under the following Sections:

- 175.105 Adhesives
- 175.300 Resinous and polymeric coatings
- 176.170 Components of paper and paperboard in contact with aqueous and fatty foods
- 176.180 Components of paper and paperboard in contact with dry food
- 177.1210 Closures with sealing gaskets for food containers
- 182.99 Exempt from the requirement of a residue tolerance when used in accordance with 40 CFR 180.1001 (c) as an adjuvant for pesticides in dilutions by a grower or applicator prior to application to the raw agricultural commodity

**Product Safety**

Read and understand the Material Safety Data Sheet (MSDS) before using this product.

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