



NUMBER 4146-5 (Supersedes 4146-4)

# Natrosol™ 250 hydroxyethylcellulose

## Nonionic Water-Soluble Cellulose Ether

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

Natrosol 250 HEC is used as a thickener, protective colloid, binder, stabilizer, and suspending agent, particularly in applications where a nonionic material is desired. The HHR-P type is the most efficient nonionic thickener available. All viscosity types are available 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., 250 HBR) 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%
HHR-P	5,000 - 6,400	—	—
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	—
L	—	—	75 - 150

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

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

<sup>(a)</sup>Values shown are averages and are not to be construed as specifications



## Outstanding Characteristics

Natrosol™ 250 HEC is a white, granular material that disperses and dissolves readily in water to give clear, smooth, non-thixotropic solutions; nonionic and unaffected by high concentrations of soluble salts in solution. Natrosol HEC viscosity is little affected by mild acids and alkalis, and it has good anaerobic burnout properties.

Natrosol HEC is soluble in both cold and hot water up to practical viscosity limits and has improved tolerance for aqueous-alcohol systems and is solvated by some such systems. Natrosol HEC is insoluble in and inert to all common non-aqueous organic solvents. Natrosol HEC is insolubilized by certain resins and reagents.

Natrosol HEC has wide compatibility with natural and synthetic gums and with resin and latex emulsions.

Natrosol HEC packaged in multiwall 50-lb bags, 25-kg bags and 40 bags per pallet, stretch-wrapped and capped.

## Typical Uses

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

*As a thickener* in latex paints, waterborne coatings, paper coatings, latex emulsions, cosmetics and toiletries, coatings, textile printing pastes and inks, adhesives, and brines used in completion fluids in oil field applications.

*As a protective colloid* in vinyl polymerization reactions, pigment dispersions, electroplating solutions, and as an emulsion stabilizer in oil and water systems including skin lotions.

*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* of 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 HEC 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.

## Product Safety

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