

33.015-E11  
 (Supersedes 33.015-E10)  
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## NATROSOL® 250 water soluble hydroxyethylcellulose

NATROSOL 250 hydroxyethylcellulose (HEC) is a series of off-white powders that are easily dispersed and dissolved in cold or hot water, to produce solutions of varying viscosities. Chemically, it is cellulose of short to very long chain length that has been etherified to a hydroxyethyl ether to achieve an optimum balance of properties. NATROSOL 250 is used as a viscosity and rheology modifier, protective colloid, water retention agent, stabilizer, and suspending agent, particularly in those applications where a nonionic material is desired.

### TYPES AND SPECIFICATIONS

The types of NATROSOL 250 differ in their solution viscosity, hydration behaviour, biostability, and particle size:

- the "R" and "D" types have been treated to delay hydration of the particles. This treatment prevents lumping as the powder is added to water. Specified below are the viscosity ranges of these types. These ranges also apply to:
- the B-grades (e.g. NATROSOL 250 HBR), these offer superior resistance to biological and chemical degradation,
- types that carry a "X" or "W" in their designation (e.g. NATROSOL 250 HXR and NATROSOL 250 HHW) have a finer particle size.
- of some viscosity grades also the type without retarded solubility (NATROSOL 250 L,G,H etc) is available.

Depending upon their technical and commercial feasibility, special grades to meet individual customer requirements can be made available upon request and after consultation with our salesforce.

#### Viscosity specification of NATROSOL, at 25°C, mPa.s (Method N5-5)

Non-R	TYPES				Viscosity measured at a concentration of			Brookfield LVF setting	
	X	W and D	R	B	1%	2%	5%	Spindle no	RPM
-	-	-	HHR-P	-	5.000 - 6.400	-	-	4	30
-	-	-	-	HHBR	3.400 - 5.500	-	-	4	30
-	HHX	HHW	HHR	-	3.400 - 5.000	-	-	4	30
-	HHXR	HHWD	-	-	3.400 - 5000	-	-	4	30
-	-	-	-	H4BR	2.600 - 3.300	-	-	3	30
H	HX	-	HR	HBR	1.500 - 2.500	-	-	3	30
-	HXR	-	-	-	1.500 - 2.500	-	-	3	30
-	HBXR	-	-	-	1.500 - 2.500	-	-	3	30
-	-	-	-	MHBR	1.000 - 1.500	-	-	3	30
M	MX	-	MR	MBR	-	4.500 - 6.500	-	4	60
-	-	-	KR	-	-	1.500 - 2.500	-	3	30
G	GXR	-	GR	-	-	250 - 450	-	2	60
L	-	-	LR	-	-	-	100 - 180	1	30

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### Other specifications of NATROSOL® hydroxyethylcellulose

		Method
Moisture content (as packed), %	5 max.	N5-1
pH of a solution	6,0-8,5	N5-6e
Particle sizes distribution:		
- regular grind retained on 425 micrometer, (ASTM no. 40), %	10 max.	N5-13
- X-grind retained on 250 micrometer, (ASTM no. 60), %	0,5 max.	N5-13
- W-grind retained on 177 micrometer, (ASTM no. 80), %	0,5 max.	N5-13

### PROPERTIES AND USES

NATROSOL 250 hydroxyethylcellulose is a granular powder that dissolves readily in water to give clear, smooth solutions, which exhibit a pseudoplastic flow behaviour. At neutral pH and ambient temperatures, NATROSOL R-grades disperse without lump formation and provide easy dissolution. These solutions are unaffected by high concentrations of soluble salts. Viscosity is little affected by mild acids and alkalis. Because of its nonionic character NATROSOL has wide compatibility with other materials, such as emulsion polymers, natural and synthetic gums, emulsifiers, defoamers.

NATROSOL 250 is used as high efficiency nonionic thickener, water retention aid and rheology modifier in all types of water-based paints and surface coatings, in adhesives, and in a variety of other aqueous industrial products. Regular NATROSOL 250 imparts excellent flow properties to these systems.

NATROSOL B offers the additional feature of superior storage stability when used under conditions that enhance microbial growth.

As a protective colloid and stabilizer NATROSOL performs outstandingly in the emulsion and suspension polymerization of many vinyl polymers. Its unique combination of properties explains its use in pigment dispersions and in tile adhesives.

In toothpaste the lean solvent solubility and compatibility of NATROSOL contribute consistency, its dispersibility and binding power are widely appreciated by the cosmetic and pharmaceutical industry.

### REGULATORY STATUS

NATROSOL is in compliance with the requirements of the U.S. Food and Drug Administration for use in adhesives, resinous and polymeric coatings employed on food-contact surfaces of metal, paper or paperboard articles, and other suitable substrates intended for use in food packaging as specified in the Code of Federal Regulations, Title 21, Sections 175.105, 175.300, 176.180, 177.1210, and 182.99.

NATROSOL Pharm grades meet the specifications for hydroxyethylcellulose as set by the European Pharmacopoeia and the USP/NF. These grades have been specified in Product Data Sheet 33.018.

### PACKAGING AND STORAGE

NATROSOL is packed in multi-wall paperbags of 25 kg net, supplied on pallets of 40 bags (1000 kg) each, from Zwijndrecht, The Netherlands, and from warehouses conveniently located in Europe.

NATROSOL is a non-perishable powder. It is recommended to use the product in rotation on a first-in first-out basis. The product should be stored under dry and clean conditions in its original packing and away from heat. The product is hygroscopic. The packaging is selected in a way to avoid ingress of moisture, but the water content of the packed product may increase if not stored dry.

### PRODUCT SAFETY

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

#### Toxic substances Information

**CAS Number** : 9004-62-0  
**CAS Name** : Cellulose, 2-hydroxyethyl ether