HECELLOSE®

Total Solution Provider

www.lotte-cellulose.com

LOTTE FINE CHEMICAL

Our
cellulosic
division is a core
business unit that holds the
key to the future of LOTTE Fine
Chemical. With an extremely unique
technology base, over 20 years of development,
manufacturing and sales of our products, we believe that
we can offer fine tuned, efficient products that can suit
your needs. At LOTTE, we know that better value chains
and high performance products with superior quality bring
about an overall better industry; from us, to you, to your
customers. HECELLOSE® (Hydroxyethyl Cellulose) by
LOTTE Fine Chemical is a non-ionic cellulose ether
and has been specifically modified to be applied in a
wide range of applications from waterborne architectural
coatings, building and construction, personal care products,
oil technologies, and emulsion protective colloids for
polymerization. With a strong and experienced team
supporting our continuous research and development,
as well as specifically tailored services that we
provide to meet our customer's needs.
We are glad to say that we are
able to expand our
possibility.

General Properties

Film formation

HECELLOSE® forms clear, tough, and flexible film, which has an excellent barrier property to oils and greases.

Enzyme resistance

HECELLOSE® provides excellent viscosity, stability, and long-term storage due to resistance against fungi and bacterial attacks.

Water retention

HECELLOSE® helps to maintain the water content for formulations at desired levels.

Surface activity

HECELLOSE® has a surfactant property in the solution where protective colloid functions and emulsifications are required.

Pseudoplasticity

HECELLOSE® solution shows pseudoplasticity and thins out under shear.

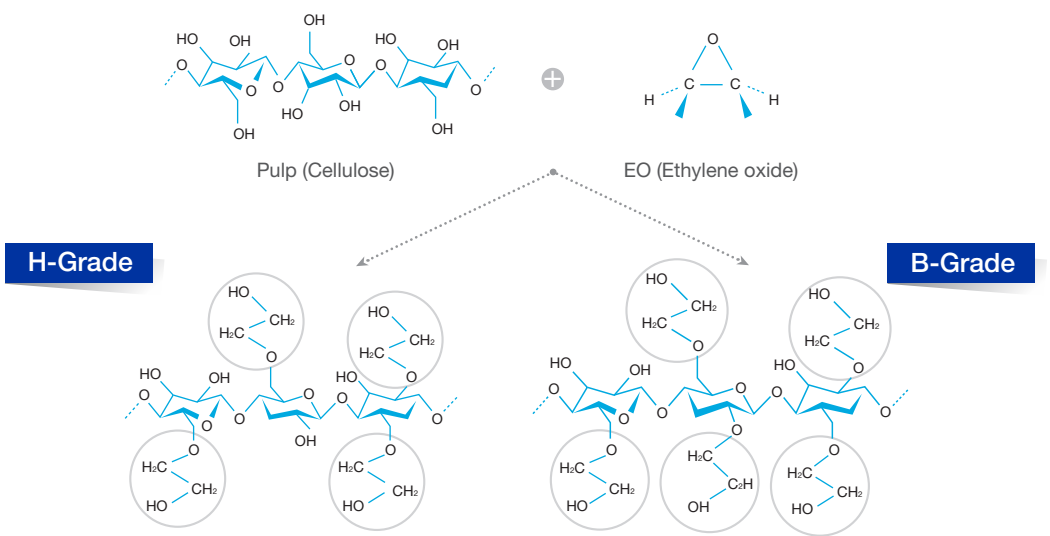
pH stability

HECELLOSE® is stable in the range of pH 3.0~11.0. However, the solubility of HECELLOSE® can be affected by acid or alkali.

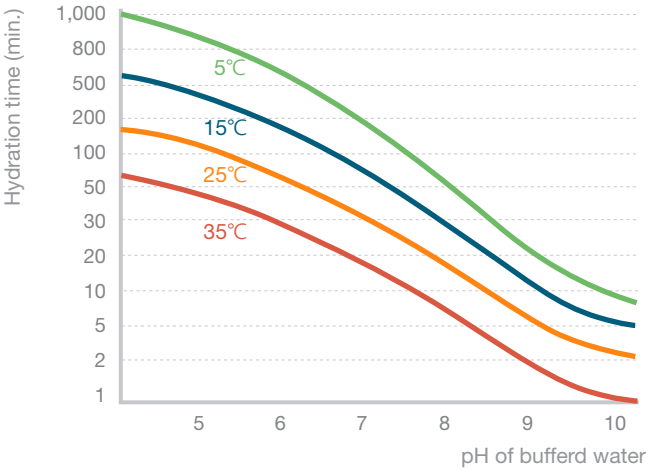
Thickening & Binding

HECELLOSE® provides thickening properties of its solutions and improves the degree of adhesion for formulations.

Chemical Structure of HECELLOSE®

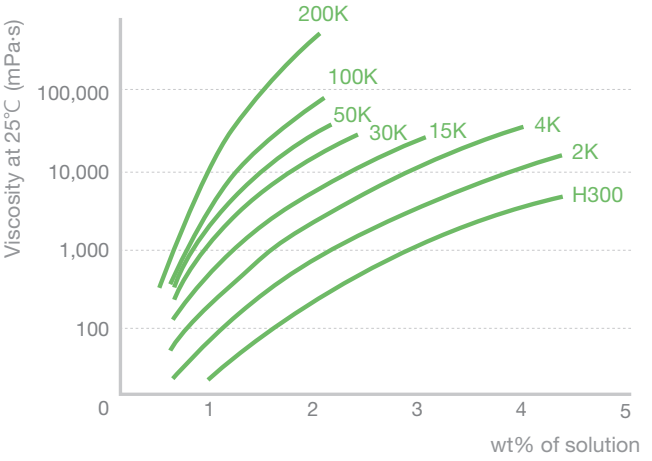


General Information



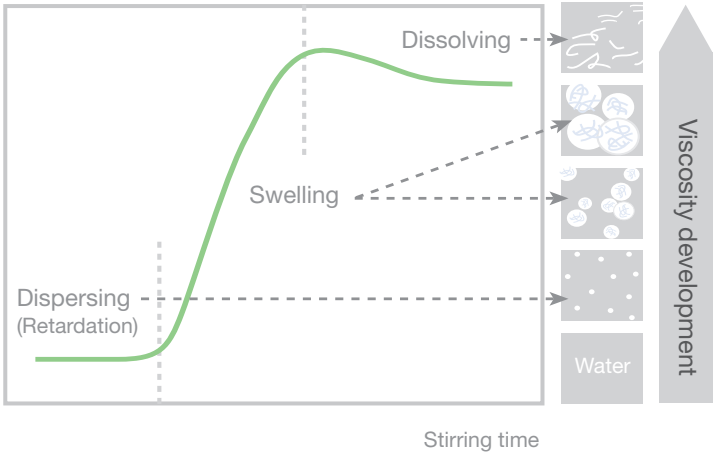
Hydration time

The hydration time of HECELLOSE® depends on the pH and the temperature of the water.
(Effect of the pH and the temperature on the hydration time of HECELLOSE® grade)



Solution viscosity

In general, viscosity of HECELLOSE® is proportional to the concentration of the solution.
(Effect of HECELLOSE® concentration on viscosity of aqueous solutions)



Dissolution mechanism

The general dissolution mechanism of HECELLOSE® is shown in the left figure.

Nomenclature

Nomenclature

HECELLOSE®	H / P / B / HM	100K
	Substitution	Viscosity (2%)
	H = General grade P = Personal care grade B = Bio-Stable grade HM = Hydrophobic Mod.	K = X 1,000 H100K = 100,000 mPa·s B15K = 15,000 mPa·s

Viscosity range

HECELLOSE®			Viscosity (mPa·s) at 25℃		Brookfield LV	
H Grade	P Grade	B Grade	Conc. 1%	Conc. 2%	Spindle	RPM
H200K		SBHV	5,000 ~ 6,000 (H200K) 4,800 ~ 6,000 (SBHV)		4	30
H100K		B100K	3,500 ~ 5,000		4	30
H50K		B50K	2,500 ~ 3,500		3	30
H30K	P30K	B30K	1,500 ~ 2,500		3	30
H15K		B15K	1,000 ~ 1,500		3	30
H4K		B4K		4,500 ~ 6,500	4	60
H300				250 ~ 550	2	60

HMHEC (Hydrophobically Modified HEC, Associative Thickener)				
HM500	250 ~ 750	-	2	6

Paints & Coatings

HECELLOSE® offers a pseudoplastic behavior with wide compatibilities that can be matched with an extensive range of colored pigments, emulsions, surfactants, emulsifiers, defoamers and preservatives.

HECELLOSE® properties

Excellent color acceptance

Wide compatibility with paint components & colorants

Rheology modifiers

Pseudoplastic or associative viscosity build-up

Viscosity stability

Excellent long term stability on aging

Water retention

Good water retaining ability and open time

Choose HECELLOSE® grades according to molecular weight

HECELLOSE® Molecular weight		
Performance	High	Low
Viscosity	+	-
Sag resistance	++	+
Open time	+	++
Anti-spatter	-	++
Leveling	-	++

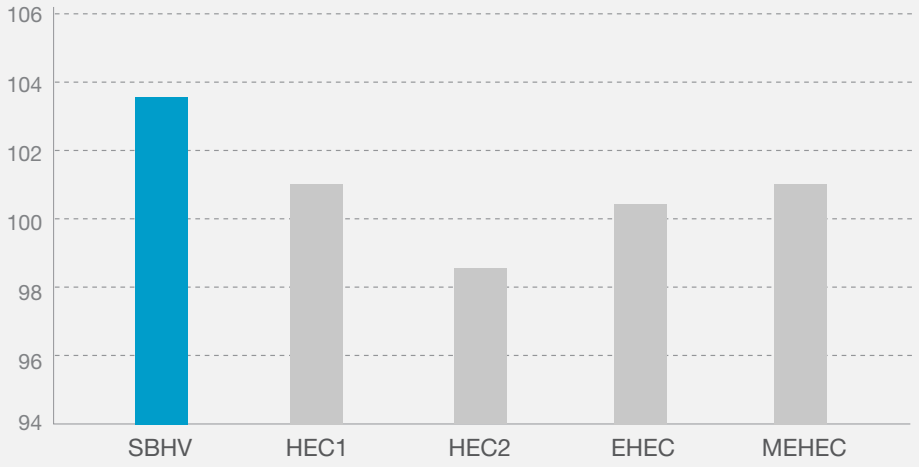
Selection guide

HECELLOSE®			
Performance	H grade	B grade	HM grade
Spatter resistance	+	+	+++
Color acceptance	+++	+++	++
Bio-stability	-	+++	++

HECELLOSE® is available for a variety of waterborne interior and exterior paints in order to achieve highly efficient viscosity build-up and economically excellent performances.
Our HECELLOSE® will result in enhanced performances in your paint products.

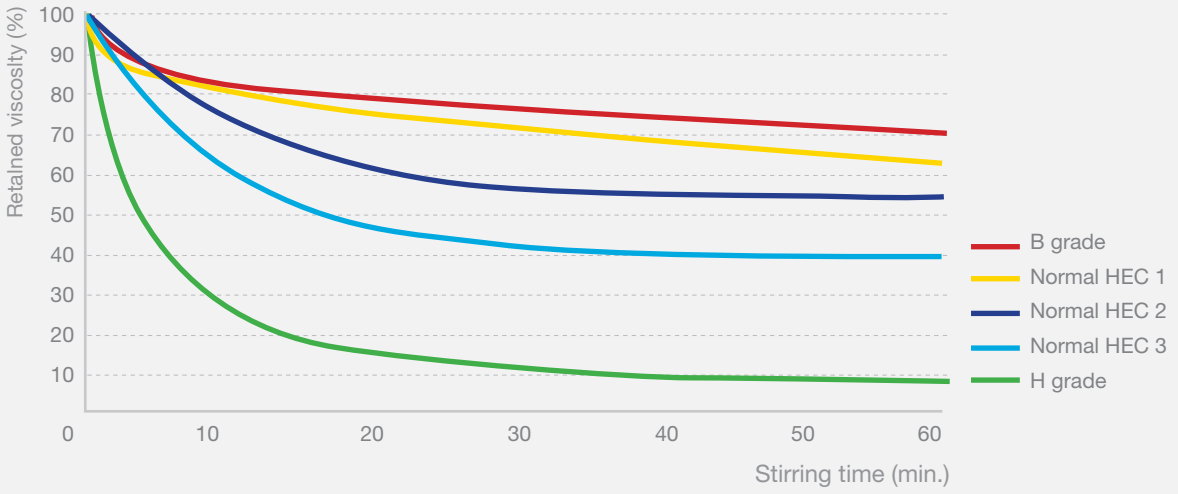
Thickening efficiency of SBHV

HECELLOSE® SBHV showed a distinguishing thickening efficiency in paints compared to other HEC thickeners (Bio-stable grades).



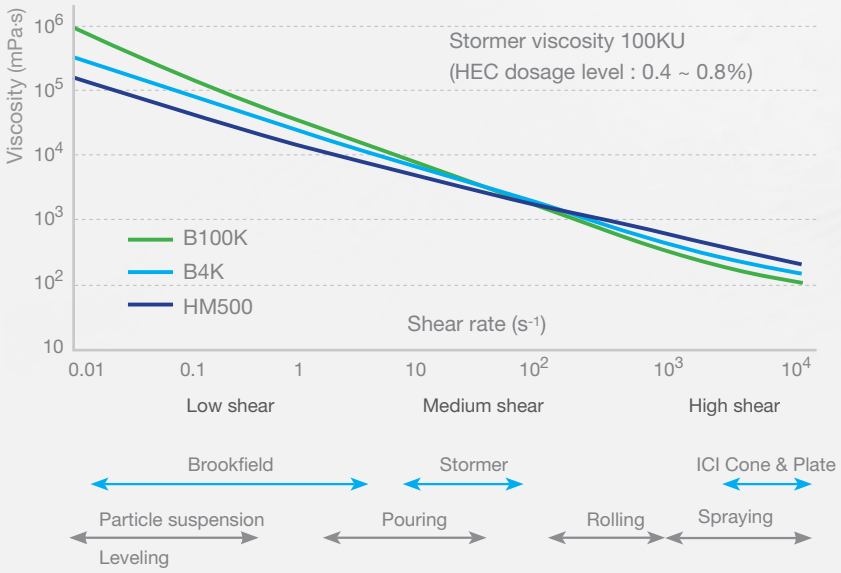
Bio-stability

Bio-stability is observed in an aqueous solution with enzymes.



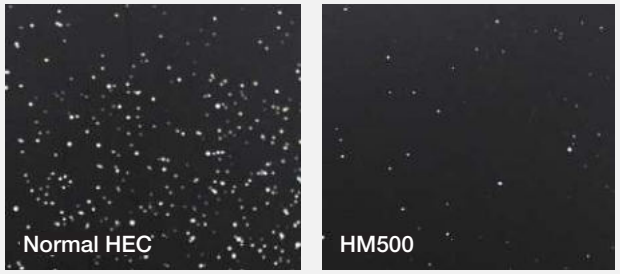
Viscosity vs. shear rate in paint

Depending on the paint formulation, particularly the binder, the addition level of HM-grade HECELLOSE® is required to reach a specified Stormer viscosity may vary; this applies to all associative thickeners.



Spatter resistance

White spots are spatters on black paper during roller application. The more spots present, the worse spatter resistance.



Input Methods in Paint

As a dry powder

This technique is normally used when HECELLOSE® can be added as a dry powder directly to the batch of water in the pigment grind. When added, the water should be neutral or slightly acidic. Alkaline ingredients are added after thorough dispersion of the cellulose ether.
After the grinding process, the latex can be added in let down stage.
HECELLOSE® should never be added as a dry powder after latex addition because the latex will coat the particles of HECELLOSE® and dissolution time will be greatly extended.

As a slurry

Slurries are readily made by dispersing a HECELLOSE® either in water or in a suitable organic solvent. Such slurries are generally usable within half an hour after preparation.
When working with aqueous slurries of HECELLOSE®, the pH must be 7 or less.

As a stock solution

Stock solutions are made by adding HECELLOSE® powder to water and stirring until the thickener is dissolved.
When using a HECELLOSE®, the water should be neutral or slightly acidic.
If it is alkaline when adding HECELLOSE®, the thickener will dissolve too quickly, forming an insoluble gel instead of a solution and generate micro foam. If you're planning to store stock solutions for a prolonged length of time, we recommend that stock solutions should be protected from microorganisms by using a suitable preservative.

Joint Compounds

HECELLOSE® has been developed for optimum and superior performance in tape joint compound formulations. It offers outstanding results in field applications.

HECELLOSE® properties

Water retention
Control and manage large volumes of water presented

Workability
Pseudoplastic and shear-thinning rheology

Adhesion
Optimizing interation between water-soluble polymers and minerals

Stability
Excellent long-term stability in aging

Dry properties
Homogeneous, smooth and easy-to-sand finish

Performance

HECELLOSE® is used by itself or in a combination with MECELLOSE® for joint compound. As a result, it enhances workability and sag resistance, and reduces shrinkage, crater and crack.

Performance	HECELLOSE®	MECELLOSE®	HECELLOSE®+MECELLOSE®
Water retention	+	+++	++
Bond strength	+	+++	++
Crater	++	+	++
Crack resistance	+++	+	++
Shrinkage	++	+	++
Workability	+	++	++

Selection guide

Polymer type	Viscosity (mPa·s)	Property
HECELLOSE®	(Brookfield LV, 1%)	
H100K	3,500~5,000	Thickening efficiency
H50K	2,500~3,500	Less foaming
H30K	1,500~2,500	Good workability
MECELLOSE®	(Brookfield HA, 2%)	
PMB-40H	3,500~5,000	Rapid solubility
PMB-40HS	3,500~5,000	Good workability
FMC-53001	28,000~38,000	Good workability
FMC-53501	30,000~40,000	High bond strength
PMH-9860	30,000~40,000	Good workability

Personal Care

HECELLOSE® P-Grade is used as a thickening agent, rheology controller, dispersing agent, and emulsifier for shampoos, lotions. HECELLOSE® P-Grade is pseudoplastic and shear-thinning. As a result, personal care products formulated with HECELLOSE® P-Grade contributes not only to a thickening effect of the products but also to deliver improved solution stability.

Performances of HECELLOSE® in personal care

Clarity of solution

In an aqueous solution, HECELLOSE® provides higher clarity by reducing haziness and fiber contents.

Pseudoplastic flow

HECELLOSE® has shear thinning property which enables personal care products to be spreaded more easily on hair or skin.

Tolerance to pH and salt

HECELLOSE® is a non-ionic polymer; therefore, it has a high tolerance for dissolved electrolytes or salts and remains stable in pH variations.

HECELLOSE®

Lubricity

HECELLOSE® enhances the flow and dispersion of products as a result of its lubricating characteristics in aqueous conditions.

Anti-syneresis

In colloidal or suspension, HECELLOSE® can improve stability and reduce undesirable sedimentation.

Selection Guide

HECELLOSE®	Viscosity (Brookfield LV, mPa·s)
P30K	1,500~2,500 (1%)

Special Applications

Oil field

HECELLOSE® is used as a fluid loss and rheology control additive in oil field applications, especially water-based oil-well servicing fluids.
Solutions of HECELLOSE® have pseudoplastic or shear-thinning behaviors. As a result, our products provide enhanced workability.

Properties
- Fluid Loss Control
  : HECELLOSE® provides water retention properties in cement formulation which can lead to improved workability. It also prevents the slurry pre-maturing and dehydration in permeable stratum.

- High Thickening Efficiency

- Easy Dissolving

- Eco-friendly material

Emulsion polymerization

Used as thickening and suspending agent, protective colloid, and emulsion stabilizer for the manufacturing of Emulsion Polymerization.
HECELLOSE® is used as protective colloids in both emulsion and suspension Latex polymerization.
HECELLOSE® is chosen to stabilizes growing polymer particles in the control and in the stabilization of the finished latex to freeze-thaw and mechanical shear.

Detergents

Used as thickening agent in washing powders, pastes, soaps and emulsions.

Construction applications

HECELLOSE® provides good workability, water retention and increases thickening property in latex-based products such as plaster, wall-putty, tile adhesive and self leveling compound.

Packaging & Safety Information

Packaging

HECELLOSE® is packed in the following two types of package :

A. 25kg : net multi-layer paper bag with polyethylene inner liner
- 750kg is placed on one pallet, and 12MT is loaded in one container of 20ft

B. 450kg : net jumbo bag with polyethylene inner liner
- 900kg is placed on one pallet, and 9MT is loaded in one container of 20ft

Storage

HECELLOSE® should be stored under dry and clean conditions in its original packaging due to its hygroscopic properties.

Safety Information

While HECELLOSE® is classified as a non-hazardous material, be aware of the following notice to avoid unexpected accidents when handling:

Handling precautions

Use only with adequate ventilation and personal protection. If product gets wet, it could cause a slipping hazard.

First Aid Measures

EYE CONTACT : Wash eyes with plenty of water or normal saline at least 15min.
SKIN CONTACT : Wash skin with plenty of soap and water for at least 15min.
INHALATION : Remove from exposure area to fresh air immediately.
INGESTION : Do not induce vomitting. Wash out mouth with water and get medical attention.

Additional information

For further information on safety, please refer to the (Material) Safety Data Sheet(MSDS/SDS) and/or contact LOTTE Fine Chemical directly or our representatives.

LOTTE
FINE CHEMICAL

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