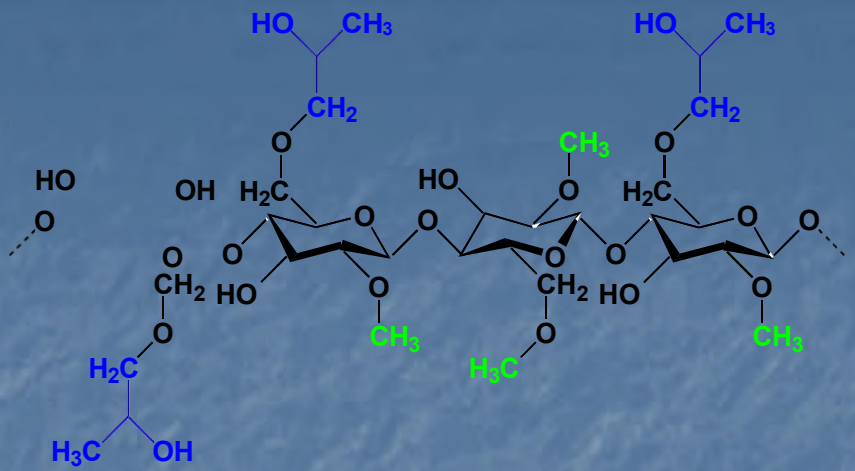
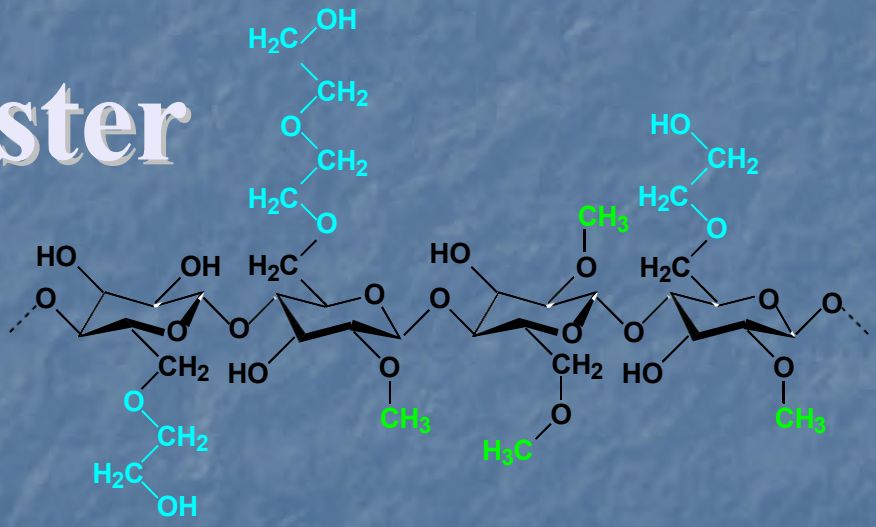


KimaCell for Gypsum Plaster



General Properties of KimaCell Cellulose ether

Water Solubility	KimaCell easily dissolves in cold water
Water Retention	KimaCell has the property to reduce water-loss of its formulations when its formulations are applied to water absorbing surfaces such as wallboard, etc.
Non-ionic Charge	KimaCell is compatible with other additives in aqueous solution and provides a stable combination of water solubility
pH Stability	KimaCell is stable in wide range of solution pH (3 to 11), while the viscosity build-up speed of retarded grades is affected by pH.
Organic Solubility	KimaCell is soluble in some binary organic and organic-water solvent systems due to the internal balance of Hydrophilic and hydrophobic groups in its molecule.

Suspending Aids	KimaCell enhances stability of suspension throughout solution.
Surface Activity	KimaCell has surfactant property in solution where protective colloid function, emulsification are required.
Thermal Gelation	KimaCell aqueous solution gels when temperature of its solution rises up till specific level. But the gel goes back to the original solution state upon cooling.
Thickening & Binding	KimaCell provides thickening property of its solution and improves adhesion degree of formulations.
Film Formation	KimaCell forms clear, tough, flexible films which has a excellent barrier property to oils and greases.
Lubrication	KimaCell improves workability and processing of mineral based products and ceramic extrusions by its lubricant property.
Emulsification	KimaCell stabilizes emulsions in its solution.
Enzyme Resistance	KimaCell provides excellent viscosity stability during long-term storage due to resistance against fungi and bacteria

KimaCell

Kima chemical produces various types of cellulose ethers based on HPMC, HEMC and MC for ***Building Applications***

A. 3 chemical types of cellulose ethers

➔ HPMC, HEMC, MC

B. 3 types of retarded cellulose ethers

➔ Non-retarded, standard retarded, long retarded products

C. 2 types of particle size

➔ Standard and fine grain size products

D. Various types of modified products for customers

➔ over 5 types of non-modified products

➔ over 10 types of modified products

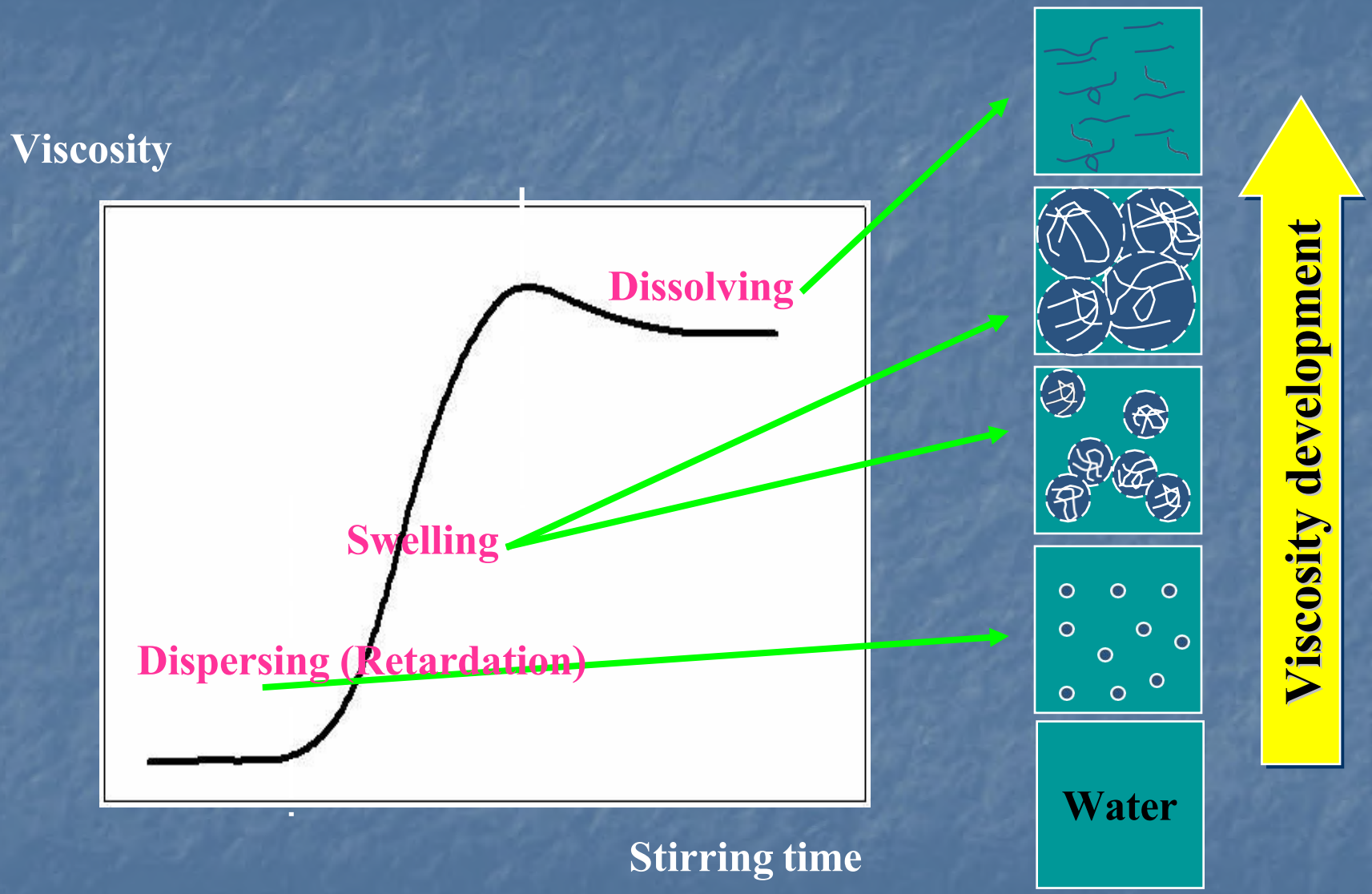
Modified KimaCell

Each modified KimaCell shows different solubility property such as no retarded, Standard retarded or long retarded solubility.
The solubility property of modified KimaCell depends on original property of basic MECELLOSE and its modification degree.
In addition, modified KimaCell has following improved properties for specific applications in building and coating industries.

Improved Properties of Modified KimaCell

- Thickening effect
- Water retention
- Increasing working time
- Workability
- Rheological behavior
- Anti-sagging
- Adhesion
- Reduction spattering
- Other properties

Solubility of retarded KimaCell



Standard and long retarded KimaCell

Viscosity

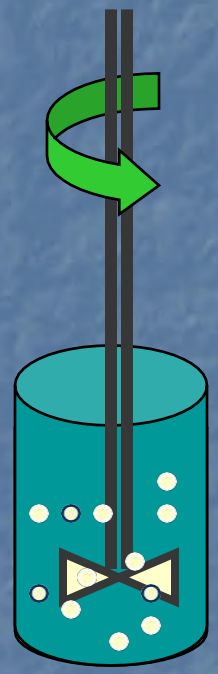
Standard retarded

Long retarded

Retardation

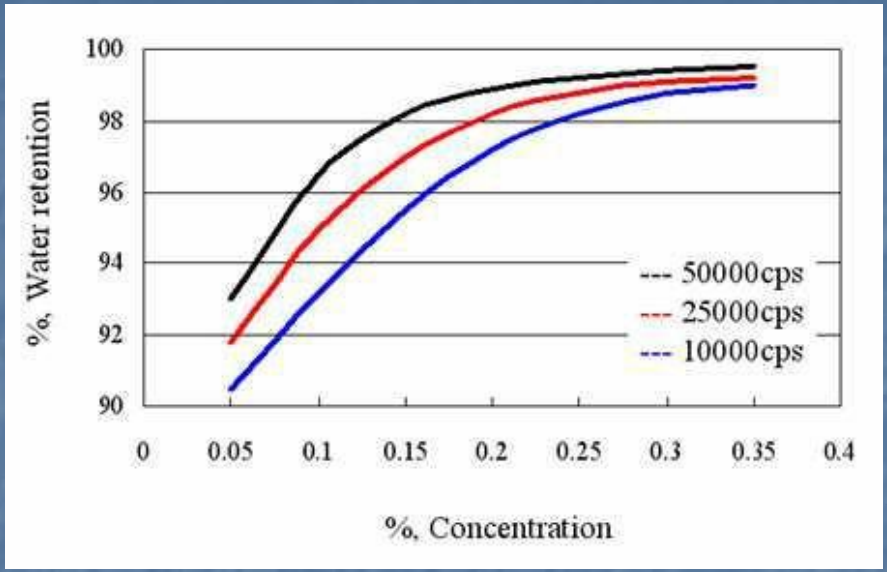
15min

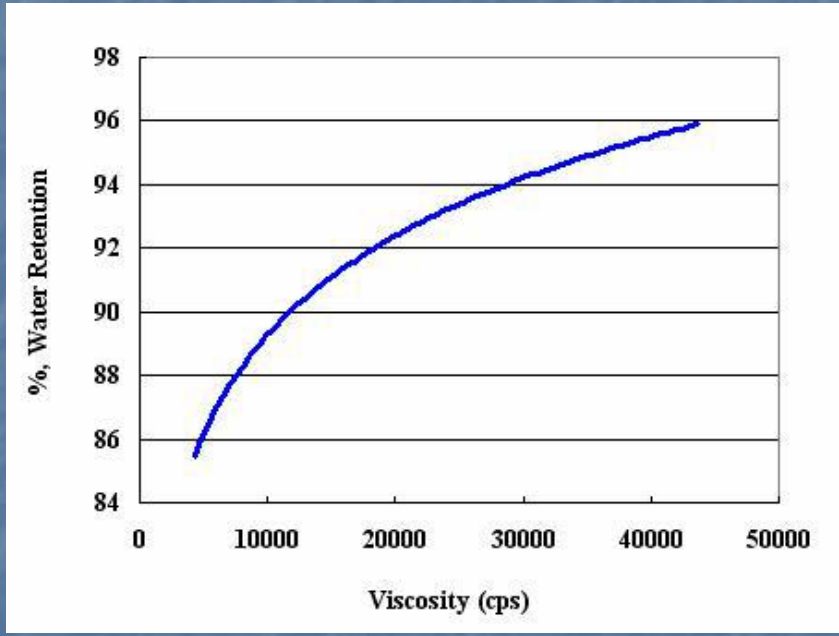
100min



Water retention of KimaCell

Water retention of KimaCell in different concentration





Water retention of KimaCell of different viscosity

Viscosity and Viscometers

- Comparison condition : solution of 2%, 20°C, pH=7

Real viscosity	Brookfield	Haake-Roto	Hoeppler	Ubbelhode
4000cps	4000	5000~6500	3000~4000	4500~5500
15000cps	15000	18000~24000	15000~20000	18000~20000
30000cps	30000	33000~44000	50000~60000	70000~80000
40000cps	40000	44000~54000	80000~100000	80000~100000
50000cps	50000	55000~80000	Over 120000	Over 150000

KimaCell for Gypsum Plasters

- **Enhancement**
  - Water retention
  - Sag resistance
  - Workability
  - Pumpability
  - Working time
  - Plaster stability

Working Steps of Gypsum Machinery Plaster

Plastering

Draw-up
~10min

Cutting
1h ~1.5h

Felting
2h ~ 2.5h

Smoothing
~3h

Brief Explanation for Plasters

Plaster type : Machine, Manual and Finishing Plasters of Gypsum

Function of components in gypsum machinery plaster

- Gypsum : Main binder / Plaster of Paris or high burnt gypsum
- Hydrated lime : Providing high pH for setting RETARTER
  Improving pumpability (lubrication effect)
- Limestone sand : Main filler (0 ~ 1mm)
- Set Retarder : Tartaric acid (Citric Acid)
  Working in alkaline-condition and increasing pot-life

Components	Materials	Function
Binders	Gypsum Hydrated lime	Basic properties - Hardness
Aggregates	Quartz, Lime Sand Various powder Perlite	2nd properties - Compressive strength - Cost/Volume advantage
Additives	Thickener Air entraining agent, Retarder Others (Retarder)	- Workability, Stickiness, Rheology - Workability, Pot-life - Optional purpose

The Guide Formulation of Gypsum Machinery Plaster

Materials	Weight of component (%)
Gypsum	40 – 50
Hydrated lime	5 – 10
$CaCO_3$ Sand	20 – 30
Silica sand	
$CaCO_3$ Powder	20 – 30
Other aggregates or fillers	Optional items
Air entraining agents	0.02 – 0.05
Retarders	0.1 – 0.2
Other additives	Optional items
KimaCell HPMC	0.15 – 0.30

The recommendation for Gypsum Machinery Plaster

Grade	Chemical Type	Viscosity Range	Modification	Grade type
HPMC MP60M	HPMC	24,000 - 36,000	Medium	General Use
HPMC MP100M	HPMC	40,000 - 55,000	High	General Use
MHEC MH60M	HEMC	24,000 - 36,000	Medium	General Use
MHEC MH100M	HEMC	40,000 - 55,000	Low	General Use
MHEC MH150M	HEMC	55,000 - 65,000	Low	General Use
MHEC MH200M	HEMC	70,000 - 80,000	High	General Use

The Guide Formulation of Gypsum Handy Plaster

Materials	Weight of component (%)
Gypsum	70 – 80
Hydrated lime	2 – 5
$CaCO_3$ Sand	10 – 20
Silica sand	
$CaCO_3$ Powder	5 – 15
Other aggregates or fillers	Optional items
Air entraining agents	0.01 – 0.05
Retarders	0.1 – 0.2
Other additives	Optional items
Cellulose ethers	0.1 – 0.2

The recommendation for Gypsum Handy Plaster

Grade	Chemical Type	Viscosity Range	Modification	Grade type
HPMC MP60M	HPMC	24,000 - 36,000	Medium	General Use
HPMC MP100M	HPMC	40,000 - 55,000	High	General Use
MHEC MH60M	HEMC	24,000 - 36,000	Medium	General Use
MHEC MH100M	HEMC	40,000 - 55,000	Low	General Use
MHEC MH150M	HEMC	55,000 - 65,000	Low	General Use
MHEC MH200M	HEMC	70,000 - 80,000	High	General Use

The Guide Formulation of Gypsum Finishing Plaster

Materials	Weight of component (%)
Gypsum	80 – 90
Hydrated lime	2 – 5
$CaCO_3$ Sand	0 – 10
Silica sand	
$CaCO_3$ Powder	5 – 15
Other aggregates or fillers	Optional items
Air entraining agents	0 – 0.02
Retarders	0.1 – 0.2
Other additives	Optional items
Cellulose ether	0.6 – 0.8

The recommendation for Gypsum Finishing Plaster

Grade	Chemical Type	Viscosity Range	Modification	Unique Properties
HPMC MP60M	HPMC	24,000 - 36,000	Medium	General Use
HPMC MP100M	HPMC	40,000 - 55,000	High	General Use
MHEC MH60M	HEMC	24,000 - 36,000	Medium	General Use
MHEC MH100M	HEMC	40,000 - 55,000	Low	General Use
MHEC MH150M	HEMC	55,000 - 65,000	Low	General Use
MHEC MH200M	HEMC	70,000 - 80,000	High	General Use

The Guide Formulation of Gypsum Based Joint Filler

Materials	Weight of component (%)
Plaster of Paris (fine)	70 – 85
$CaCO_3$ Powder	20 – 30
Hydrated lime	-
Other aggregates or fillers (Perlite/Mica)	Optional (2 - 4)
Air entraining agent	0.01 – 0.03
Retarder	0.1 – 0.2
Redisp. Powder	Optional (< 2)
Other additives	Optional
Cellulose ethers	0.6 – 0.8

The recommendation for Gypsum Based Joint Filler

Grade	Chemical Type	Viscosity Range	Modification	Grade type
HPMC MP60M	HPMC	24,000 - 36,000	Medium	General Use
HPMC MP100M	HPMC	40,000 - 55,000	High	General Use
MHEC MH60M	HEMC	24,000 - 36,000	Medium	General Use
MHEC MH100M	HEMC	40,000 - 55,000	Low	General Use
MHEC MH150M	HEMC	55,000 - 65,000	Low	General Use
MHEC MH200M	HEMC	70,000 - 80,000	High	General Use