

ELEMENTIS

A global specialty chemicals company



BENTONE HYDROCLAY™ rheology modifiers
Extraordinary water-phase rheology modifiers
sourced from nature

Enhanced Performance Through Applied Innovation



BENTONE HYDROCLAY™ rheology modifiers

The BENTONE HYDROCLAY™ series of natural clay-based rheology modifiers enable the creation of formulations that deliver innovative and elegant sensory experiences. These clays are the highest quality and purity. Their uniqueness lies in their ability not only to thicken water, but also in the pleasant silky texture that they impart both during and after application. BENTONE HYDROCLAY™ products provide thixotropy and suspension control in the aqueous phase of formulations. They are insensitive to temperature variation, so they impart thermostable viscosity control in formulas.

Whether creating novel and memorable sensory experiences or suspending effect pigments or mineral sunscreens, these unique rheology modifiers deliver in new and surprising ways.

Incorporation

To incorporate BENTONE HYDROCLAY™ products, it is first important to appropriately wet out the clay.

Standard protocol

Disperse BENTONE HYDROCLAY™ in glycerin, butylene glycol, propanediol, propylene glycol etc at a ratio of 1 part clay to 3 parts humectant. Then add water with propeller mixing at 500 rpm.

Direct to water incorporation

Add clay to water prior to the addition of other ingredients using medium to high sheer mixing at a neutral pH. Hydrate for at least 10 minutes prior to adding other ingredients. Heating the water up to 60°C reduces hydration time. It is important to have only unadulterated water during the dispersion stage. Surfactants or electrolytes should not be added until dispersion is completed.

BENTONE HYDROCLAY™ 2000

INCI Name: Hectorite

BENTONE HYDROCLAY™ 2000 is our most efficient hydrophilic rheology modifier and is based on hectorite. Due to its small size, platelet shape, and large surface area, BENTONE HYDROCLAY™ 2000 is able to form strong, stable viscous gels with thixotropic flow behavior. It is light in color, vegan and is a COSMOS approved natural ingredient making it a perfect rheology modifier for all natural formulations needing the maximum in stability, suspension and thickening. In formula, it has a soft, silky feel with a soft-focus, blurring effect. Typical use level: 0.3 - 5%

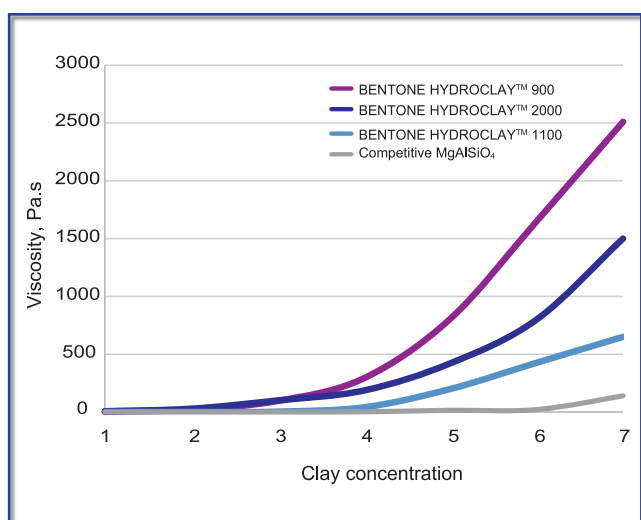
BENTONE HYDROCLAY™ 1100

INCI Name: Magnesium Aluminum Silicate

BENTONE HYDROCLAY™ 1100 is a COSMOS approved, natural, vegan rheology modifier which is light in color. BENTONE HYDROCLAY™ 1100 provides good thixotropic rheology and suspension. It has the best rheological properties compared to other magnesium aluminum silicate products. BENTONE HYDROCLAY™ 1100 imparts silky touch and soft focus, blurring effect on skin upon application.

Typical use level: 0.25 - 9%

Figure 1. Viscosity build comparison

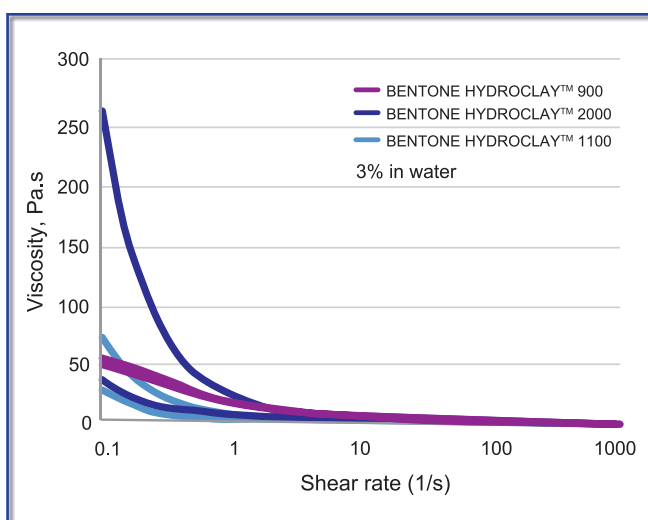


BENTONE HYDROCLAY™ 900



INCI Name: Hectorite, Hydroxyethylcellulose

BENTONE HYDROCLAY™ 900 is a blend of hectorite and hydroxyethylcellulose. This combination provides greater electrolyte stability than using the clay alone. The combination provides good thickening with pseudoplastic rheology. This product has a natural origin index of 1 (100%) as assessed according to ISO 16128.

Figure 2. Rheological flow comparison



BENTONE HYDROCLAY™ rheology modifiers typical properties

Property	BENTONE HYDROCLAY™ 2000 	BENTONE HYDROCLAY™ 1100 	BENTONE HYDROCLAY™ 900
pH Range	6 - 11	6 - 11	3 - 11
Acid Stability	Weak	Weak	Good
Electrolyte Tolerance	Good	Good	Excellent
Max Pre-gel Concentration	4	8 - 9	3 - 4
Ease of Dispersion	Excellent	Good	Good
Viscosity	Good	Good	Excellent
Suspension	Excellent	Good	Excellent
ISO 16128 Natural Index	1	1	1



COSMOS
APPROVED

Raw material approved by ECOCERT GREENLIFE in accordance with the COSMOS standard

Cleansing cherry jam

Natural. sulfate-free, salt-free cleanser applies velvety smooth with a creamy lather.

Phase	Ingredient	Supplier	%w/w
A	Deionized Water		50.5
	CI 16035 (C37-A207 FD&C Red 40 1% solution in water)	Sun Chemical	1.0
B	Glycerin		15
	Hectorite (BENTONE HYDROCLAY™ 2000)	Elementis	5.0
C	Coco-Glucoside (Plantacare® 818 UP)	BASF	15.0
	Decyl Glucoside (Plantacare® 2000 UP)	BASF	12.0
	Fragrance (Cherry)		0.5
D	Benzyl Alcohol (and) Glycerin (and) Benzoic Acid (and) Sorbic Acid (Rokonsal™ BSB-N)	Ashland	1.0
E	Citric Acid		q.s.

Procedure:

1. Combine Phase A.
2. Premix Phase B and add to Phase A with propeller stirring (500 rpm). Mix several minutes.
3. Premix Phase C and add to A/B with gentle stirring.
4. Add Phase D.
5. Adjust pH by adding Phase E to 5.2 to 5.6.

Anti-gravity eye primer

Eye lifting serum with silky, cushiony application. Slight tightening effect upon drying.

Phase	Ingredient	Supplier	%w/w
A	Deionized Water		69.8
	Butylene Glycol		18.0
	Magnesium Aluminum Silicate (BENTONE HYDROCLAY™ 1100)	Elementis	1.0
B	PEG-2 Dimeadowfoamamidoethylmonium Methosulfate (MEADOWQUAT® HG-70)	Elementis	2.5
	Hydrolyzed Hyaluronic Acid 1% solution (HyaCare® 50)	Evonik	1.0
C	Caprylhydroxamic Acid (and) Propanediol (Zeastat™)	Inolex	1.0
	Phenoxyethanol (2-Phenoxyethanol)	SLI Chemicals	0.7
	Water (and) Hydrogenated Starch Hydrolysate (and) Ascophyllum Nodosum Extract (and) Asparagopsis Armata Extract (Aldavine 5x)	Lucas Meyer	0.5
D	Citric Acid (10% aqueous solution)		q.s.

Procedure:

1. Add Phase B to Phase A with propeller mixing.
2. Add Phase C to Phase A/B and continue stirring.
3. Add Phase D and mix.

Cha-cha all night lip stain

Emulsion-based lip stain with lasting color and light silky-smooth application.

Phase	Ingredient	Supplier	%w/w
A	Deionized Water		65.0
	Glycerin		5.0
	Hectorite (and) Hydroxyethylcellulose (BENTONE HYDROCLAY™ 900)	Elementis	0.5
	Red 40 (FD&C Red 40 007700-C)	Sensient	0.1
B	Octyldodecanol (Jarcol™ I-20VCG)	Jarchem	10.0
	Behenyl Alcohol (and) Glyceryl Stearate (and) Glyceryl Stearate Citrate (and) Disodium Ethylene Dicocamide PEG-15 Disulfate (CERALUTION® H)	Sasol	5.0
	Trimethylsiloxyphenyl Dimethicone (BELSIL® PDM 1000)	Wacker	4.0
	Hydrogenated Polyisobutene (FANCOR® POLYISO® 450-CG)	Elementis	4.0
	Microcrystalline Wax (Multiwax W-835)	Sonneborn	2.0
	Cetyl Alcohol	Protameen	1.0
	Steareth-20 (Lipocol® S-20)	Vantage	1.0
Red 21 (Unicert Red K7061-J)	Sensient	0.4	
C	Mica (and) Isopropyl Titanium Triisostearate (and) Sodium Lauroyl Aspartate (and) Zinc Chloride (ASI Sericite GMS-4C)	Kobo	1.5
	Phenoxyethanol (and) Propylparaben (and) Butylparaben (Phenonip)	Clariant	0.5

Procedure:

1. Combine Phase A, except dye, with moderate propeller mixing. Add the dye and heat to 75 - 80°C.
2. Combine Phase B, except dye, and heat to 80°C. Add dye to Phase B and mix well.
3. Add Phase C to Phase B with propeller mixing.
4. Add Phase B/C to Phase A using high shear homogenizing.
5. Cool to room temperature with propeller mixing.



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