

# VARISOFT® EQ 100

## High performance conditioning with improved sustainability

### Intended use

Conditioning agent

### Benefits at a glance

- Superior conditioning properties compared to market standards especially on wet hair
- Outstanding manageability, lubricity and softness of hair
- Solvent free, non-flammable, 100% active matter
- Easy to handle, liquid material
- Primarily based on rapeseed oil, a renewable feedstock
- Readily biodegradable quat
- Low process temperature possible
- Clear Shampoo formulations possible
- Universal application possible

### INCI (PCPC name)

Quaternium-98 (proposed)

### Chemical and physical properties (not part of specifications)

Appearance (20 °C)	liquid
Active matter	100%

### Properties

VARISOFT® EQ 100 is an ester quat based on a special distribution of vegetable sourced fatty acids.

It is a readily biodegradable and has an improved ecotox profile compared to the common benchmarks.

VARISOFT® EQ 100 provides excellent conditioning properties on both wet and dry hair. It is also very efficient on curly hair types (tested on Mulatto hair).

Due to its liquid form, it is universally applicable in various hair care formulations, such as conditioners, shampoos and leave-in sprays.

In surfactant based formulations it provides a significant thickening benefit.

### Conditioning efficacy

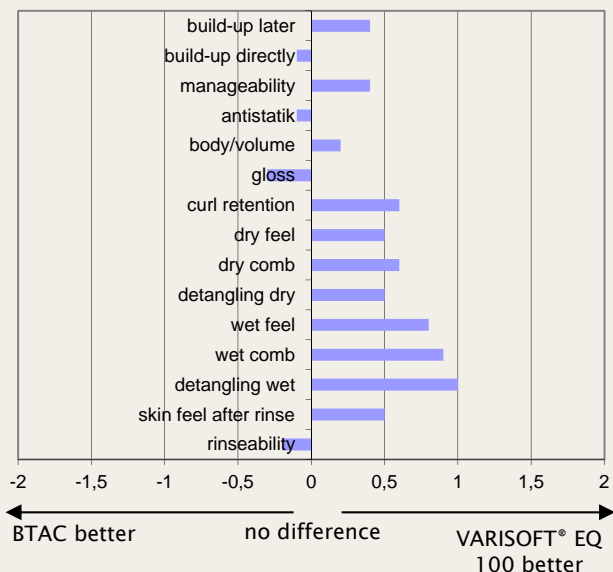
VARISOFT® EQ 100 statistically significantly outperforms the benchmark Behentrimonium Chloride in all categories on wet hair (detangling, wet comb, and wet feel). The performance on dry hair is at least on the same level. The results were obtained out of conditioner applications in more than 30 sensory hair swatch tests with bleached European hair bundles. The improved wet combability was confirmed by technical combing force measurements.

Technical half head tests- performed by an external test institute - verified the excellent conditioning properties of VARISOFT® EQ 100.

*Figure 1* half head study shows that for all key parameters VARISOFT® EQ 100 outperformed BTAC (Behentrimonium Chloride), the difference in the "detangling wet" category is statistically significant.

**Conditioner test formulations:**

- 0.5% TEGINACID® C (Cetareth-25)
- 5.0% Cetearyl Alcohol
- 1.0% active cationic
- Ad 100% water; pH value = 4.1.

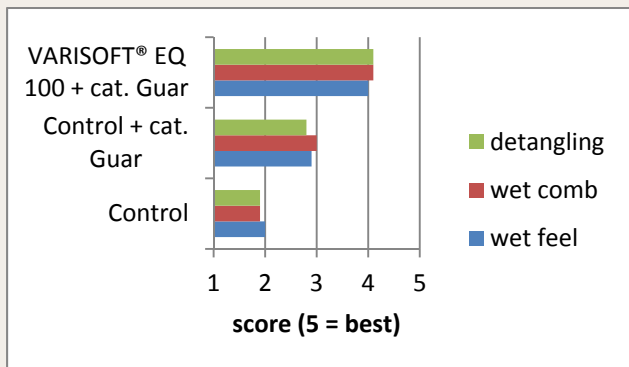


**Figure 1: Conditioner half head test results – comparison between VARISOFT® EQ 100 and BTAC (Behentrimonium Chloride).**

VARISOFT® EQ 100 is also an efficient conditioning agent out of a shampoo application. Figure 2 shows the result of a sensory hair swatch test, using European bleached hair bundles.

**Shampoo test test formulations:**

- 9.0% Sodium Laureth Sulfate
- 3.0% Cocamidopropyl Betaine
- 0.2% Cationic Guar
- 1.0% VARISOFT® EQ 100
- 0.5% PEG-7 Glyceryl Cocoate
- 0.5% NaCl / 2.5% ANTIL 171
- ad 100% water; pH = 6.0



**Figure 2: Shampoo sensory hair swatch test results**

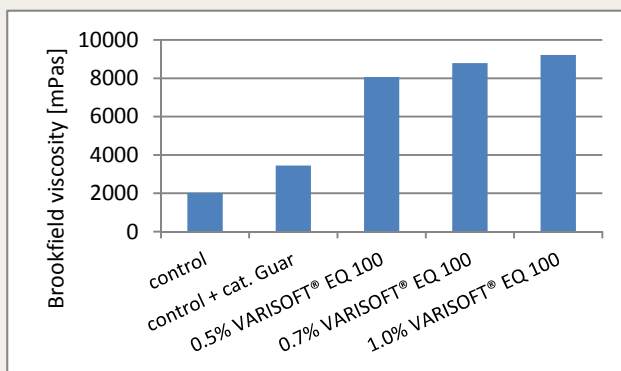
Also for shampoo application a technical half head test has been conducted externally. All tested parameters were improved by adding VARISOFT® EQ 100.

**Thickening efficacy in shampoos**

In surfactant formulations, VARISOFT® EQ 100 provides a viscosity increase. The necessary thickener concentration can be reduced as additional benefit. Figure 3 shows viscosity data of various concentrations of VARISOFT® EQ 100 in a shampoo base.

**Shampoo test test formulations:**

- 9.0% Sodium Laureth Sulfate
- 3.0% Cocamidopropyl Betaine
- 0.2% Cationic Guar
- x% VARISOFT® EQ 100
- 0.5% PEG-7 Glyceryl Cocoate
- 0.5% NaCl / 1.3% ANTIL 171
- ad 100% water; pH = 6.0



**Figure 3: Viscosity effects in shampoo**

**Application**

VARISOFT® EQ 100 can be used for formulating

- Hair conditioners (rinse-off and leave-in)
- Conditioning shampoos
- Hair and body shampoos
- Detangling sprays

## Processing

### Conditioners

To obtain viscosity stable formulations, the following formulation hints are helpful:

- higher levels of fatty alcohol are necessary, e.g. > 5% Cetearyl Alcohol per 1% of VARISOFT® EQ 100 . The addition of low levels of Oleyl Alcohol is beneficial for stability.
- An emulsifier is necessary for stability, e.g. a solid quat, such as VARISOFT® EQ 65 Pellets; TEGO® Care PBS 6; TEGO® Care PSC 3.
- Polymers are beneficial for stability, e.g. 0.05% TEGO® Carbomer 140 or 0.05% Alginate.

An antioxidant agent (e.g. Propyl Gallate, Oxynex LM) is recommended for color stability at higher temperatures.

### Shampoos:

VARISOFT® EQ 100 is clearly soluble in surfactant systems in combination with e.g. PEG-7 Glyceryl Cocoate (ratio 1 : 1). Due to its thickening effect, the thickener level can be reduced.

## Recommended usage concentration

0,5 % – 3 % VARISOFT® EQ 100

## Packaging

800 kg pallet (4 x 200 kg drum)

## Hazardous goods classification

Information concerning

- classification and labeling according to regulations for transport and for dangerous substances
- protective measures for storage and handling
- measures in accidents and fires
- toxicity and ecological effects

is given in our material safety data sheets.

## Guideline formulations

Conditioner, eco friendly UW 779/1/4		
A	TEGO® Alkanol 1618 (Cetearyl Alcohol)	7.00%
	VARISOFT® EQ 100	1.00%
	TEGO® Care PBS 6 (Polyglyceryl-6 Stearate; Polyglyceryl-6 Behenate)	1.00%
	TEGIN® M Pellets (Glyceryl Stearate)	2.00%
B	Water	86.90%
	Propyl Gallate	0.10%
	Glycerin	2.00%
Preservative, perfume		q.s.
<b>Preparation:</b> <ol style="list-style-type: none"><li>1. Blend phases A and B separately, heat them up to 65°C.</li><li>2. Combine both phases, homogenize for 30 seconds.</li><li>3. Cool down while stirring, add preservative and perfume &lt;45°C.</li></ol> Viscosity (Brookfield): 9900 mPas. pH = 4.5. <i>Remark: storage tests not finalized.</i>		

Conditioning Shampoo, clear	UW 798/2
Sodium Laureth Sulfate (28%)	32.00%
TEGOSOFT® GC (PEG-7 Glyceryl Cocoate)	0.70%
VARISOFT® EQ 100	0.70%
Water	56.90%
Hydroxypropyl Guar Hydroxypropyltrimonium Chloride	0.20%
TEGO® Betain F 50 (Cocamidopropyl Betaine)	8.00%
NaCl	0.50%
ANTIL® 171 (PEG-18 Glyceryl Oleate/Cocoate)	1.00%
Preservative, Perfume	q.s.
<b>Preparation:</b>	
1. Blend TEGOSOFT® GC and VARISOFT® EQ 100.	
2. Dissolve cationic guar in water.	
3. Blend ingredients in the given order.	
Viscosity (Brookfield): 8900 mPas. pH = 5.9.	
<i>Remark: storage tests not finalized.</i>	

Spray Detangler "Hair Milk" (leave-in conditioner)	UW 830/2
Water	96.00%
VARISOFT® EQ 100	2.00%
Glycerin	2.00%
Preservative, perfume	q.s.
<b>Preparation:</b>	
Blend ingredients in the given order.	
Homogenize.	
Viscosity (Brookfield): water like. pH = 4.4.	
<i>Remark: storage tests not finalized.</i>	

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