

Varisoft® 222 LM 90%

- Dispersible at regular rinse concentrations of 3–10% in water temperatures as low as 13 °C
- Formulates stable emulsions up to 25% activity
- Excellent fluidity
- Can be formulated with acids to produce softeners sours

Composition

N,N-Bis(2-tallowamidoethyl)-N-(2-hydroxyethyl)-N-methylammonium methylsulfate

CAS Number

68153-35-5

Chemical and Physical Properties (Not Part of Specifications)

Appearance @ 22 °C	Hazy Liquid
Total solids	90%
Gardener color, max. (1963)	5
pH (10% in 50:50 IPA/water)	6
Minimum pumping temperature	22 °C

Properties

- Dispersible at regular rinse concentrations of 3–10% in water temperatures down to 13 °C, eliminating both the need to heat water before formulation and the need to cool formulation before packaging
- Formulates stable emulsion to 25% activity
- Excellent fluidity eliminates heating prior to use

- Imparts fluffy, dry and non-greasy softness to fabric
- Treated fabrics have excellent water absorbency even after multiple laundry cycles
- Non-yellowing
- Treatment effects varying from ironing aid, to processing aid, to general softening, to superior softening, can be obtained by adjusting the concentration (see chart inside)
- Easy formulation of high-solids, dilutable concentrates
- Can be formulated with acids to produce softener sours

Packaging

VARISOFT 222 LM (90%) softener ingredient is packaged in lined, open-head drums, 425 pounds net weight. It is also available in bulk quantities.

Storage and Processing Recommendation

The material is susceptible to darkening if stored at excessive temperatures [approx. 50 °C (122 °F)] for prolonged periods. The storage tanks should be equipped with heating and stirring or circulation pumping facilities to prevent possible separation as well as with protection against explosion.

Storage

Drum	5–30 °C process within 6 months
Bulk	45–50 °C process within 1 month

Hazardous goods classification

Information concerning

- Classification and labelling according to regulations for transport and for dangerous substances
- Protective measures for storage and handling
- Measures in accident and fires
- Toxicity and ecological effects

is given in our safety data sheets.

Applications

- Household fabric softeners
- Commercial laundries
- Nursing Homes
- Hospitals
- Hotels

Formulation

1. Water Quality

In general, hard, soft, or deionised water may be used. Both deionised water and soft water tend to produce more viscous dispersions, but viscosity may be controlled by the addition of small amounts (about 0.01% to about 1.0%) of calcium chloride, sodium chloride and sodium acetate. Partial deionization may be the most satisfactory procedure in certain areas of the country that have unusually high amounts of total dissolved salts. A “salting out” effect can take place in these extreme cases and result in dispersion instability.

2. Mixing Conditions

Viscosity also depends on the type of equipment used and the rate and time of agitation. Agitation should be sufficient to give a thin, stable dispersion, and air entrapment should be kept to a minimum.

3. Temperature

In general, a dispersion of lower viscosity is obtained with higher water temperatures, but temperatures over 70°C (158°F) should be avoided.

4. pH

Although VARISOFT 222 LM (90%) softener ingredient is stable over a wide pH range, pH of its dispersion can influence viscosity and stability. The lower the pH, the lower the viscosity. The effect is more pronounced for the more concentrated dispersion. The preferred pH range is from about 3 to 7.

Other ingredients in the Formulation such as fragrance or preservatives can have a dramatic effect on dispersion stability. Before establishing full production, an evaluation on the effects of these additives should be completed.

5. Optional Formula Additives

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Sample Formulation – Low Solids

	3% Solids	5% Solids	8% Solids
VARISOFT 222 LM (90%)	425 lbs	425 lbs	425 lbs
Water	1520 gal	875 gal	530 gal

Procedure

Measure water into a vessel equipped with high-shear agitator. Mix VARISOFT 222 LM (90%) softener ingredient with water. Mixing smoothly without whipping air into the dispersion reduces foam problems. Agitate until the dispersion is uniform usually 15 to 30 minutes, depending upon the type of agitation. Add dye, fragrance, preservative, and fluorescent whitening agent, if desired. No cooling is required if the temperature is less than 32 °C. If foam develops during mixing or bottling, add a few ounces of defoamer such as Antifoam B (Dow–Corning)¹

¹ Antifoam B is a registered trademark of the Dow Corning Company

Sample Formulation – High Solids Aqueous

Dilutable Concentrate

	20% Solids
VARISOFT 222 LM (90%)	22.8 parts by weight
Water	77.2 parts by weight

Calcium chloride solution	As needed
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Procedure

Making a 20% solids dispersion is more complicated than typical 3–8% dispersions. Manufacture requires close attention from start to finish. Consistency in manufacturing will lead to consistency in the final product. The keys to making stable high–solids dispersions are:

- 1) Providing good agitation, and
- 2) Adding a 25% solution of calcium chloride at critical times during the addition of the last half of softener to prevent gelling and to obtain the desired final viscosity.

Charge the water to a vessel equipped to provide good agitation. Heat to 43 °C and start agitation (150 rpm). Slowly add up to half of the VARISOFT 222 LM (90%). (VARISOFT 222 LM (90%) should be preheated to 38–49 °C before dispersion). Mix for 10–15 minutes or until softener is fully dispersed. Increase rpm to 350. The addition of the second half of the softener charge should be divided into at least 4 separate charges to ensure complete dispersal as follows:

- a) Add one quarter of remaining softener and agitate for 10–15 minutes or until softener is completely dispersed.
- b) Repeat (a) and check viscosity
- c) Repeat (a) and check viscosity
- d) Repeat (a) and check viscosity.

Note: At some time after addition b, c or d it will be necessary to add some of the calcium chloride solution to thin the viscosity and prevent gelling. Add only enough at one time to thin out the dispersion so that adequate agitation continues. Continue alternating softener/salt additions as necessary until all the softener is added. When all the softener has been added, mix well until dispersal is complete. (Additional salt charges may be necessary during this time to prevent gelling and lower the viscosity). When softener has been completely dispersed, begin cooling to 32 °C with agitation. Adjust pH to 4.0–4.5 with 10 % hydrochloric acid. Add preservative, and any other additives desired. Adjust viscosity with salt

solution so that final viscosity will be 100–250 cps at 22 °C.

Sample Formulation – High Solids

Dilutable Concentrates

	40% Solids	60% Solids
VARISOFT 222 LM (90%)	44	66.7
Water	41	18.3
Isopropanol	10	10
Propylene glycol	5	0.0
Hexylene glycol	0.0	5.0

Procedure

In order to achieve solids concentrations in the 40–60% range, it is necessary to use isopropyl alcohol with either propylene glycol or hexylene glycol. Do not use salt in these systems! Salt contributes to instability of the system as formulated.

Add alcohol and glycol solvent to water that has been heated to 27 °C. Slowly add VARISOFT 222 LM (90%) that has been heated to 27–32 °C to the vortex of the agitated water. Continue mixing for 30 minutes to ensure the softener is well dispersed. Add preservative, and dye and perfume if desired.

Sample Formulation – Softener Sour

VARISOFT 222 LM (90%)	22.2
Glycolic acid (100%)	50.0
Water	Balance

Procedure

Heat water to 43 °C. Add the acid slowly to the water with good agitation. Slowly add the pre–heated (35 °C minimum) VARISOFT 222 LM (90%) with good agitation. Mix about 30 minutes. Cool to 32 °C before adding dye perfume.

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Evonik Corporation 7801 Whitepine Road Richmond VA 23237-2210 USA
Phone +1 804 727 0728 Fax +1 804 727 0849

Evonik Degussa (China) Co. Ltd. Shanghai Branch 55 Chundong Road, Xinzhuang Industry Park,
Shanghai, China 201108
Phone +86 21 6119 1000 Fax +86 21 6119 1264

Evonik Nutrition & Care GmbH Rodenbacher Chaussee 4 63457 Hanau
Phone +49 0 6181 59 6338 Fax +49 0 6181 59 76338