Preparation of aqueous emulsions

All organic cationic softeners are dispersible in water when added in molten stage to water under continuous stirring. Some of our products, like REWOQUAT® W 75 H PG or REWOSOFT® TE 19 L are difficult to disperse due to the high melting range and the highly viscous dispersions formed. For these products, the concentration limit for dispersions should not exceed 15 %.

Nonionics can be added in small amounts to increase the stability of the dispersions. The viscosity of the dispersions can be reduced by adding calcium chloride solution during the dispersing process.

The organic softeners which are liquid at room temperature are much easier to disperse and dispersion concentrations of almost 20 % can be achieved without special techniques or additives. REWOQUAT® W 325 PG or REWOQUAT® W 3690 PG are some of these easily dispersible softeners.

Polyether siloxane softener aids which improve hydrophilicity are water-soluble. Alkylpolyether and cationic siloxanes are rather difficult to disperse. In these cases, some high flash solvents like glycols, solvatropes as well as nonionic emulsifiers are necessary to provide stable emulsions or microemulsions. Three typical procedures are shown below:

1. Preparation of REWOQUAT® WE 18 aqueous Dispersion (20 % actives):

   **Recipe:**
   - 77.40 parts water
   - 0.20 parts silicone antifoam emulsion
   - 22.40 parts REWOQUAT® WE 18

   **Preparation Procedure:**
   Preparation Procedure: Heat the water to 45 °C. Add the antifoam emulsion. Slowly disperse REWOQUAT® WE 18 (heated to 50 °C) in the water. During the addition of REWOQUAT® WE 18, add just enough calcium chloride solution to keep the formulation stirrable. Normally the addition of calcium chloride solution is necessary after addition of about 50 % of the REWOQUAT® WE 18. After the addition of REWOQUAT® WE 18 is complete, continue stirring for another 10 minutes and cool down to 25 °C. Finally adjust the required viscosity with calcium chloride solution. The viscosity of the dispersion should be approx. 100 mPas. Store the dispersion at room temperature. Avoid frost and temperatures above 30 °C.
2. Preparation of cationic siloxane microemulsions:

a) Microemulsion based on quat siloxane and alkyl/polyether siloxane

Recipe:
- (1) 13 - 18 parts TEGOPREN® 6924
- (2) 4 - 10 parts butyldiglycol
- (3) 9 - 13 parts TEGOPREN® 7008
- (4) 7 - 9 parts isotridecyl alcohol ethoxylate 6 EO
- (5) 55 - 66 parts water
- (6) 0.2 parts preservative

Preparation Procedure:
(1) and (2) are mixed together until the mixture is transparent. (3) is added slowly and stirred until the mixture is homogenous. Then (4) is added. (5) is added slowly while stirring. After adding (6) the mixture is stirred again.

b) Microemulsion based on quat siloxane and polyether siloxane

Recipe:
- (1) 2 - 5 parts isotridecyl alcohol ethoxylate 8 EO
- (2) 55 - 65 parts water
- (3) 13 - 18 parts TEGOPREN® 6924
- (4) 5 - 10 parts butyldiglycol
- (5) 15 - 20 parts TEGOPREN® 5884
- (6) 0.1 parts glacial acetic acid

Preparation Procedure:
(1) and (2) are mixed together and heated up to 40 °C. The mixture of (3) and (4) is added slowly while stirring. Then (5) is added slowly while stirring. (6) is added and mixed.