REF: TT/ DEC.09/WK3

AMINOMETHYL POLYSILOXANES-
EMULSIFICATION PROCESS

Emulsification can be done by two processes-

1. Direct Process
2. Indirect Process

In direct process, surfactants are added first into water and oil is added at constant rate under slow agitation.

In the indirect process, oil is blended with surfactants and water is added with slow agitation at constant rate. Phase transfer takes place in indirect method after the addition of certain amount of water. The point is called inversion point and quantity of water is called inversion water.

Parameters	Direct Process	Indirect Process
Order of RM addition	Oil is added into water and surfactant mixture	Water is added into oil and surfactant mixture
Particle size distribution	Wide	Narrow
Stability	Good	Very good
Shelf life	Good	Very good
Mixing energy required	Less	More
Time	Less	More

Effect of Fluid Characteristics

The ease with which aminomethyl polysiloxanes can be emulsified has resulted in countless formulations. Amino fluids can be formulated both into macro (milky) and micro (transparent) emulsions by the judicious choice of surfactant system suitable for a particular fluid. The choice of the emulsifier is normally based on the properties of the fluids to be emulsified and the concentration of the emulsion to be made.

In conventional aminomethyl polysiloxanes, higher the amine content and lower the viscosity, the easier it is to emulsify them. This is because the polarity of the polymer is high compared to fluids having low amine content and high viscosity. Aminomethyl polysiloxanes of low viscosity and high amine content are suitable for micro emulsions. Short chain length (viscosity) eases the process of making micro emulsions.

Reactivity and structural modifications of amine functionality also help in preparing micro emulsions, depending on the extent of polarity change of the polymer and the increase in compatibility with the emulsifier system.

Neutralisation of the amine functionality of the polymer during emulsification by the addition of acids, results in the formation of polarised esters in the emulsion. These polarised molecules become a part of the surfactant system and contribute to the transparency and stability of the emulsion and ease of emulsification.