Stellar Unity
EST. 2019

Technical Information Sheet

47/66 · Nimitmai Road · Soi Nimitmai 40 · Klong Samwa · Bangkok 10510 | MB +66 81 173 2307 | Email: stellarunity2019@gmail.com

Functional Additives for Emulsion Polymerization (EmPol)

Revision version : 001	Date of revision : 26–Dec-2024	**Prepared by :** Adisakdi Ch.

Product Category	• Functional additives • EmPol modifying reagents
Application	• Used to modify acrylic acid EmPol • Coupling agent for Acrylic Emulsion Paints
Key Function(s)	• Improve adhesion of acrylic emulsion • Enhance dispersing property of acrylic emulsion • Improve metal substrate bonding of acrylic emulsion • Improve QUV resistance

SILOK 3823F5 Acrylate based reactive silicon monomer

Stellar Unity is sales representative of Silok products for industrial market applications. And one example product of functional additives for Emulsion Polymerization Process is shown here.

Silok 3823F5 is a bulky monomer, MW of 3000 g/mol, with acrylic based reactive polysiloxane chemistry. It consists of 40% by mole of silicone content. It can be incorporated into acrylic based emulsion polymerization to improve particular performance such as non-sticky surface, UV resistance, and adhesion on metal surfaces.

Dosages

- 3-5% by mole into acrylic based emulsion to improve surface softness or characteristics
- 10-30% by mole into acrylic based emulsion to improve anti-fouling, self-cleaning, and UV resistance

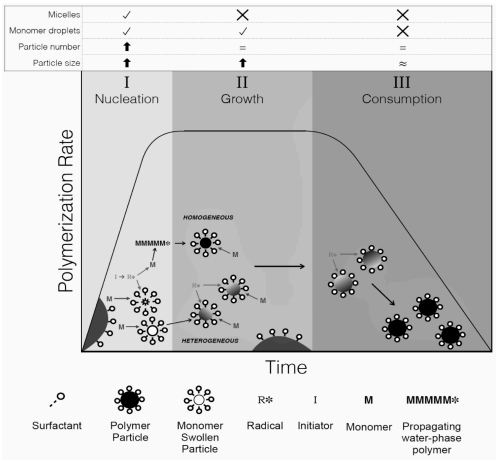
For more information of product

Website : www.s-unity.com

47/66 · Nimitmai Road · Soi Nimitmai 40 · Klong Samwa · Bangkok 10510 | MB +66 81 173 2307 | Email: stellarunity2019@gmail.com

Emulsion Polymerization

The illustration of emulsion polymerization is described below.



Polymerization occurs in the micelles formed by surfactants used. Solubility differences of acrylic-based monomers may require suitable initiators and proper surfactants. So, SILOK 3823F5 will be copolymerized in the process altogether with other acrylic monomers used, see below and the following guideline.

Simple Formulations (only for description)

- Water (H_2O)
- Surfactant(s)
- Acrylic-based monomers
- SILOK 3823F5
- Initiator(s)
- Optional, buffering agent such as $NaHCO_3$ or NaOH

The instruction of **SILOK 3823F5** into acrylic-based emulsion is briefly guided by the following order.

1) Prepare the emulsion by adding ingredients into the reactor starting from water
2) Spare portions of 25% by weight of three materials ie. surfactant(s), acrylic monomers, and initiator(s). Continue to feed three materials into the reactor. Stir.
3) Raise up the temperatures to optimize reaction rate depending to acrylic monomers used 80-90 °C
4) Maintain the reaction time for 30 mins to 60 mins
5) In a separate vessel, pre-emulsion at room temp of mixing 75% by weight of the remaining surfactant(s), acrylic monomers, and initiator(s), together with SILOK 3823F5.
6) While mixing, start to feed in (5) into the reactor. Hold the reaction at 80-90 °C for 3-4 Hrs.
7) Add initiator to make sure complete reaction

47/66 · Nimitmai Road · Soi Nimitmai 40 · Klong Samwa · Bangkok 10510 | MB +66 81 173 2307 | Email: stellarunity2019@gmail.com

8) Cool down to 25 °C while stirring

Usually, the emulsion product prepared will undergo the evaluation based from basic parameters up to application test evaluation. The following parameters are measured such as grit contents, solids content, viscosity, MW of polymer, glass transition temperature (Tg), Minimum film formation temperature (MFFT), and paint formulations with different ingredients and pigments to meet end users' target criteria.

Please contact Stellar Unity if there are more functional additives that you want to incorporate to your acrylic-based emulsion or exchange with our technical team from manufacturer for final properties of paints, adhesives, and inks you are looking for.