Oscillating Baffled Flow Crystallizer

From batch to continuous crystallization

Project: CS-01-08
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Budget: 50 K€
Duration: Succesfully completed

Incentive:

- Significant reduction in crystallization time (from 8 hours down to 15 minutes)
- Continuous production: no batch to batch variation
- Better filterability
- Narrower particle size distribution
- Many independent operating variables to affect the crystallization process
- Many design parameters to optimize crystallizer design for specific mixtures

Objective:

Proof of principle of continuous crystallization of real product mixtures from participating companies leading to reduction of crystallization time.

Approach:

Nitech Labs investigated Mixing conditions, Amplitude, Frequency, Starting temperature, End temperature, Cooling profile, Seeding, Hold times, concentration/solvent, ratio/solids loading and Filtration index.

OBFC consists of a tubular crystallizer through which the mixture is pumped continuously that has to be crystallized.

1. Superimposed on the feed flow is an additional flow that can be manipulated in amplitude and frequency.
2. The tubular Crystallizer contains baffles with orifices perpendicular to feed flow. This introduces various design parameters: distance between baffles, diameter of orifices, variation in diameter and distance along the tube.
3. It is possible to superimpose a heating and/or cooling profile axially along the tubular crystallizer.

Results:

Three Proof of Principle tests performed Successful combinations of OBFC/mixtures identified.