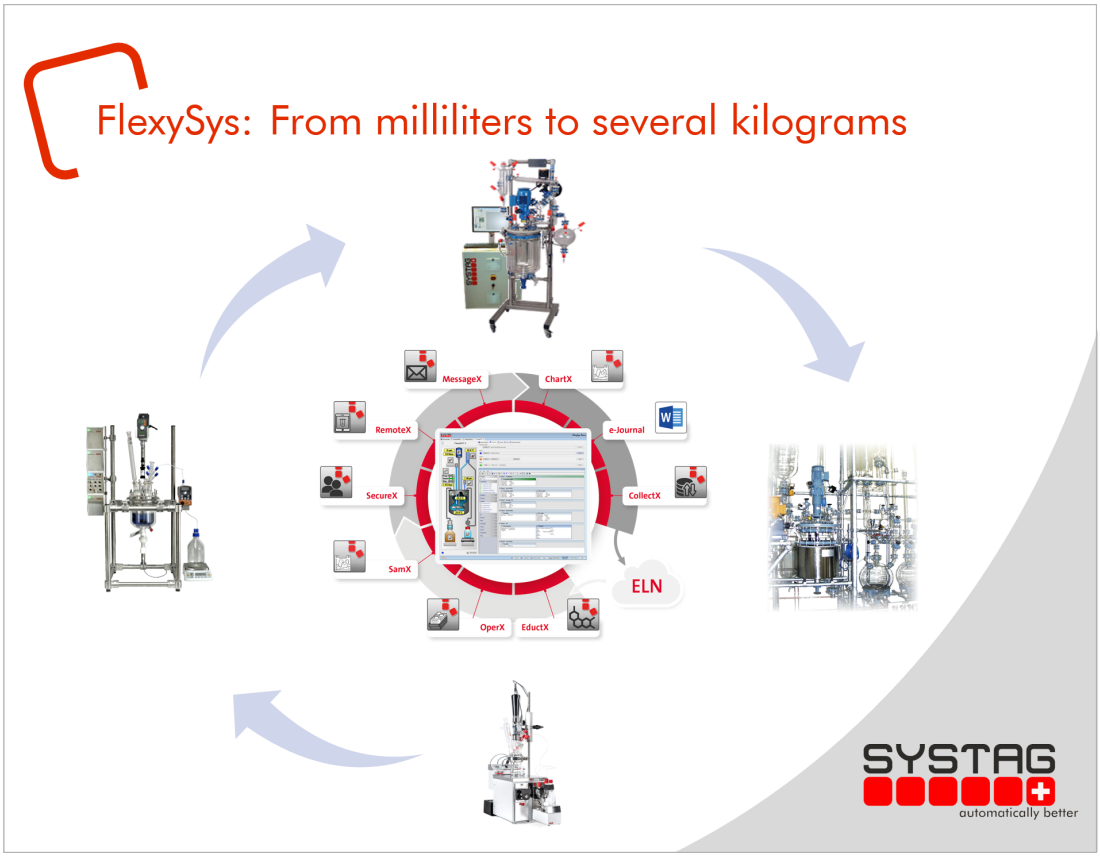
Application note

SYSTAG batch reactor control



Robust and economical development of chemical processes in batch reactors requires a seamless combination of process research, process development and scale-up.

SYSTAG's FlexyConcept combines a wide range of reaction sizes from milliliter to kilogram scale on just one system and allows the process engineer to compare different reaction variables and process parameters from the different reaction vessels easily and quickly.

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Batch Reactor Control

Introduction

SYSTAG offers a wide range of tailor made batch reactor systems for laboratory scale as well as small scale production meet the specific challenges of pharmaceutical process scale-up in being able to transfer a reaction process developed in the laboratory at milliliter or gram scale to a kilo-lab or pilot plant system.

Key elements beside an intuitive process control software in maintaining control of the batch reaction process is the thermal potential of a synthesis process. Both provided by the SYSTAG FlexyConcept for batch reactors.

Process Transfer Solutions

In pharmaceutical process development, the aim is to transfer processes from lab scale reactors into 25 liter pilot scale, as efficiently and reproducibly as possible. However, where this scale-up involves different laboratories, in fully diversified plants, there is the risk that crucial data and information will be lost, slowing development and approval.

Integrated automation of laboratory reactors from the smallest scale up to the kilo-batch on one and the same IT platform is therefore enormously helpful in more efficient batch control and tech transfer.

FlexyConcept from SYSTAG provides a uniquely integrated solution with all data available across the process and able to be displayed at the click of a mouse in a single chart, whether from milliliter or kilogram scale.

FlexyCUBE - Parallel Synthesis Workstation

FlexySys Platform

Different Reactor Systems

At the heart of the FlexyConcept architecture is the FlexySys application software that can be used to drive a variety of different reactor, up to 6 vessels on the same Computer.

These may include:

- FlexyCUBE: is a 70-400ml lab system to be operated in parallel for different parameter screening, process optimization (QbD, QRA) in pharmaceutical and chemical research.
- FlexyPAT: Designed for 0.5L...5L as bench-top batch reactor for first stage scale up (~x20) studies including thermal investigation and Reaction Calorimetry.
- FlexyPlant: 25lt kilo lab second stage scale up system that can be used to confirm quality and robustness of process to cGMP/ CFR 21 Part 11 standards for compliant qualification for production and also as a multifunctional production plant for small batches of active ingredients.

FlexySys Advantages

FlexySys delivers a unique combination of process research, process development and scale-up capability, allowing process engineers to undertake complete synthesis and scale-up of the entire process using the same plant. Seamless data exchange and recording allows different reaction variables to be compared easily and quickly, while drag & drop functionality allows automation steps or complete recipes to be intuitively transferred from one reactor to another.

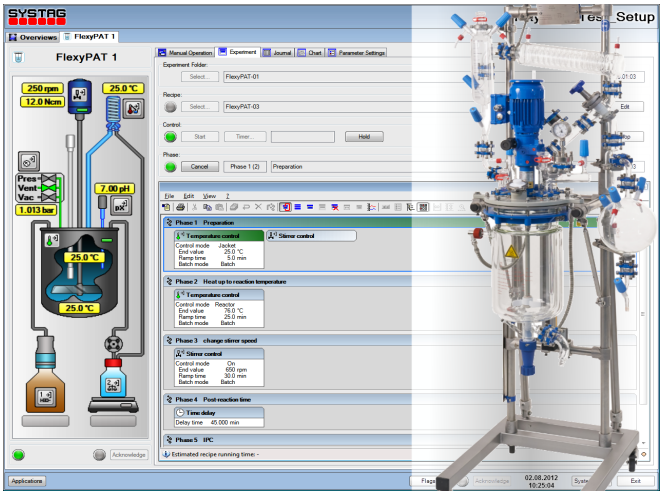

Chart 2: User interface

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