



**Safety**



**Selectivity**



**Labor Efficiency**

# Continuous Cryogenic API Plant for a liquid solid reaction

An API producer wanted a save and cost effective solution for an extremely difficult API synthesis step. The aim was to increase economics of the process and increase the safety level.

## Reaction: Continuous Solid Dosing into a high corrosive liquid under cryogenic conditions

A solid starting material is dosed under cryogenic conditions continuously into a corrosive solution at  $-60\text{ }^{\circ}\text{C}$  and reacts under precise conditions. The overall residence time has been improved from 7 hours to less than 15 minutes. The executed reaction is one synthesis step of an Active Pharmaceutical Ingredient (API) and fulfils GMP and ATEX requirements. The plant is designed to manufacture a couple of tons of API per year.

- **Continuous Solid Dosing**
- **Process safety increased**
- **Lossless scale-up**



After a promising laboratory development at the labs of MicroInnova, a continuously operating manufacturing plant for this reaction has been designed and realized by MicroInnova Engineers. The plant has been handed over to the Pharma customer in the Middle East. The modular system consists of 2 feed modules and one complex reaction unit.

**We are immeasurably proud of the completed project and the excellent co-operation.**