

Particle Engineering and Crystallization

We master solid state across the entire drug substance lifecycle - from crystallization to drying, milling and beyond



- 1 From solid form selection to commercial manufacturing
- 2 Robust crystallization and particle engineering solutions
- 3 Quality, process efficiency and scalability

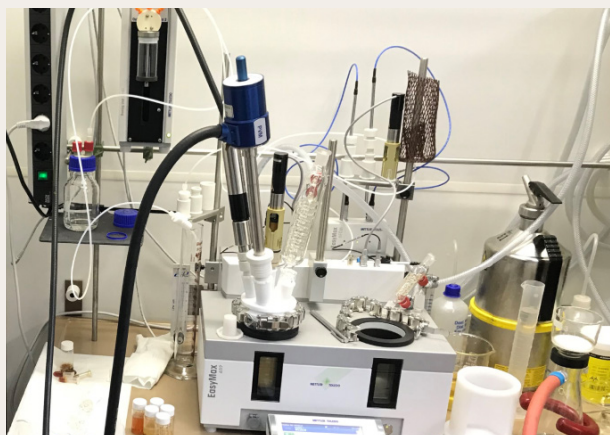
YOUR PARTNER FOR PARTICLE ENGINEERING IN DRUG SUBSTANCE MANUFACTURING

Why Particle Engineering Matters

For small molecule APIs, particle properties directly impact:

- Bioavailability and dissolution
- Product purity and impurity rejection
- Filtration and drying performance
- Process robustness and manufacturing efficiency
- Successful scale-up and commercial supply

Our multidisciplinary teams combine crystallization expertise, advanced analytics, process development, and manufacturing know-how to optimize the complete solid-state journey from molecule to market.



Real-World Challenges, Practical Solutions – Proven Impact:

- **50 % shorter filtration times** through crystal form and process optimization.
- **50 % reduction in residual solvent levels** through improved crystallization design
- **>30 % improvement in solid-liquid separation** through continuous crystallization implementation.
- **Robust scale-up** from laboratory development to commercial production.



Our Capabilities

Solid Form Development:

- Polymorph, salt, hydrate and solvate screening
- Solid-form selection and stability assessment
- Phase diagram and solubility studies

Crystallization Development:

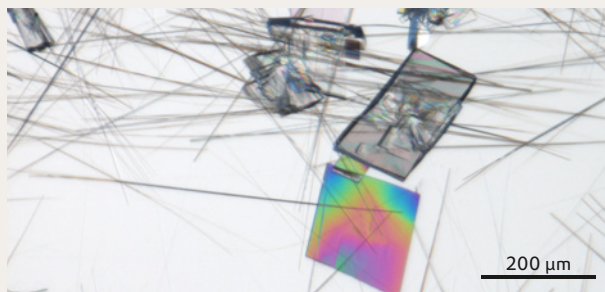
- Process design and optimization
- Batch and continuous crystallization
- Yield, purity and particle-size control

Particle Engineering:

- Filtration and drying optimization
- Milling and micronization strategies
- Processability and scale-up support

Advanced Analytics & PAT:

- PXRD, DSC, TGA, DVS, Raman and microscopy
- Real-time process monitoring
- Solid-state characterization and control



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