ALTASCIENCES

SPRAY DRYING NANOSUSPENSIONS

A Novel Approach for Improved Bioavailability in Solid Dosage Forms

Over 70% of new chemical entities have low aqueous solubility. Poor solubility hinders a drug's ability to dissolve in the body, which is essential for absorption, bioavailability, and ultimately, therapeutic effectiveness.

Our industry-leading expertise in formulation development and nanomilling, alongside our capabilities in spray drying, can help to overcome the challenges of complex API development. Nanomilling and spray drying technologies, when integrated, offer a scalable solution to overcome dissolution challenges and improve therapeutic efficacy.

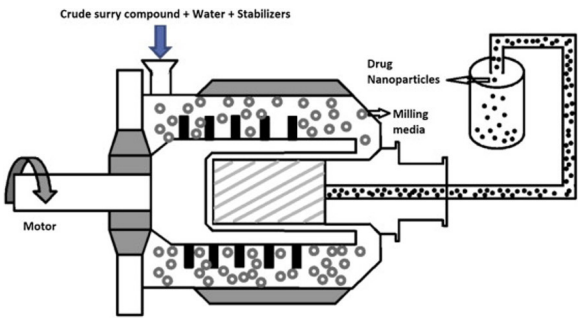
COMPLEMENTARY TECHNOLOGIES

NANOMILLING

Particle Size Reduction Technology

Nanomilling is a top-down particle size reduction technique that transforms coarse drug crystals to nanometer-scale particles (100-500 nm) using high-shear mechanical energy with milling media such as zirconia beads. This process significantly increases the surface area while maintaining the crystalline form, making it more stable than amorphous dispersions.

- Requires drug API, stabilizers (surfactants/polymers), and milling media.
- Improves dissolution rate through increased surface area.
- Compatible with various APIs and scalable for production.

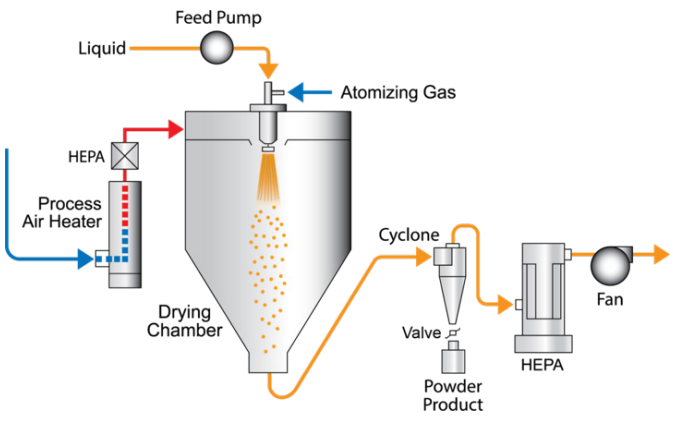


SPRAY DRYING

Converting Liquid to Solid

Spray drying is a continuous, scalable process that converts liquid feed into dry powder through atomization into a hot air stream, causing rapid solvent evaporation. When applied to nanosuspensions, it preserves the nanocrystal size while creating a stable, solid dosage form.

- Involves feed preparation, atomization, drying, and collection.
- Controls particle morphology, size, and flowability.
- Enables better dose uniformity and dissolution.



EFFECTS AND BENEFITS OF A COMBINED APPROACH

The advantages of an integrated approach include eliminating the need to dissolve APIs (particularly advantageous for poorly soluble drugs), preserving nanocrystal size post-drying when properly formulated, and enhancing dispersion, dissolution rate, and bioavailability of the final powder.

Enhanced Bioavailability

Nanosizing improves the dissolution rate of poorly soluble APIs, while spray drying creates a physically stable solid state that maintains the high surface area advantage.

Improved Stability

The combined approach transitions liquid nanosuspensions into stable, free-flowing powders with preserved nanoscale properties and enhanced physical stability.

Scalable and Versatile

Both processes are industry-validated and can be scaled for commercial production, enabling either reconstitution for suspension dosing or direct compaction into solid forms.

WHY CHOOSE ALTASCIENCES?

It's simple. When you partner with us, you benefit from:

- A fully qualified and FDA-inspected GMP manufacturing facility;
- In-house analytical and R&D laboratories;
- Integrated teams and process alignment for seamless transfer and scale-up; and
- Accelerated timelines and up to 40% in savings for end-to-end programs.

30+
YEARS OF EXPERIENCE

99%
ON-TIME DELIVERY

DEA
LICENSE FOR SCHEDULE I-V

Our turnkey pharmaceutical development and manufacturing services include:

- Full analytical and physical characterization of your molecules
- Pre-formulation testing, formulation, and process optimization
- R&D and cGMP manufacturing—from early development through to clinical trial supply (Phases I to IV)
- Handling of potent and non-potent APIs
- In-house nanomilling and spray-drying equipment
- Manufacturing of all dosage forms, including tablets, powder and liquid-filled capsules, terminally sterilized injectables, nanomilled suspensions, gels, and creams
- Over-encapsulation, labeling, and clinical packaging
- Scale-up and engineering batch manufacturing
- Late-phase and commercial-scale manufacturing of finished dosage forms

Our integrated CRO/CDMO teams ensure smooth transitions and seamless data transfers between drug development phases—so your product moves quickly from discovery to market, without compromising on safety.

STRUGGLING WITH API SOLUBILITY OR BIOAVAILABILITY?

Connect with our experts today to explore how our manufacturing solutions can align with your drug development needs.

SPEAK WITH AN EXPERT

ALTASCIENCES

altasciences.com | contact@altasciences.com