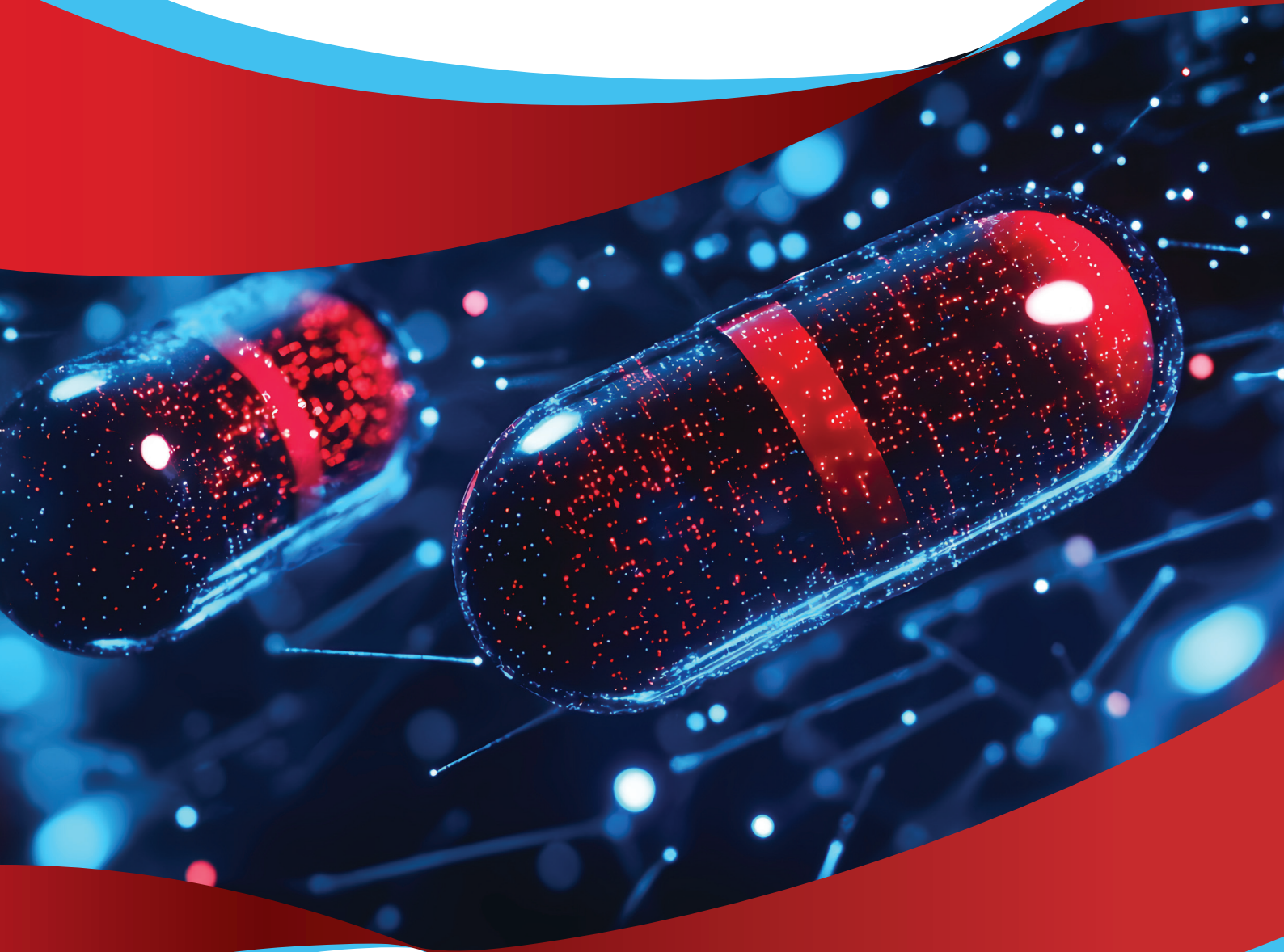


Compounding Pharmacies & the Nanotech Frontier

Meeting the Precision Challenges of
Tomorrow's Medicine with PerMix



 **PerMix**
Perfect Mixing Technologies
www.permixmixers.com

The Trials & Tribulations of Nanotech-Based Compounding

A Deeper Look Into the Challenges—and the PerMix Solutions That Lead the Way

As personalized medicine and pharmaceutical nanotechnology converge, compounding pharmacies are emerging as key players in the next wave of medical innovation. But this transformation doesn't come without its share of complexities. Whether you're operating a small-scale compounding lab or expanding into clinical nanotech formulation, the mixing, drying, and handling processes demand a new level of sophistication.



Challenges Faced by Compounding Pharmacies in the Nanotech Age

Ultra-Fine Particle Control

Nanotech APIs often require particle sizes under 100nm. Maintaining control of these sizes during mixing, suspension, or drying is critical to bioavailability, absorption rate, and therapeutic efficacy. Traditional equipment lacks the torque, shear, or uniformity to meet these demands.

Dose Uniformity & Blending Precision

Even trace deviations in blending nanoscale compounds can lead to ineffective or unsafe doses. Consistency becomes mission-critical—and achieving it across small batches with unique formulations is no easy task.

Contamination Control at the Molecular Level

Cross-contamination is exponentially more dangerous at the nanoscale, especially when APIs are highly potent. Shared equipment or poorly designed seals become liabilities, not just inconveniences.

Temperature, Oxygen, and Light Sensitivity

Many nanotech APIs are prone to oxidative degradation, hydrolysis, or thermal instability. Exposure during open-air mixing or conventional drying processes can compromise formulation quality before it ever reaches the patient.

Regulatory Compliance and GMP Standards

As regulations tighten around personalized and nanotech therapies, compounding pharmacies must adapt to GMP-ready standards—even in small-batch, research, or clinical compounding.

"Today's compounding pharmacies are tomorrow's nanotech labs—and the pressure to innovate is real."

Engineered for Precision. Built for Compliance. Scaled for Growth.

The PerMix Solution Framework

PerMix provides compounding pharmacies with a complete mixing, emulsifying, and drying ecosystem, tailored to meet the demands of nanotechnology and personalized medicine. Whether you're scaling up production or validating a formulation in R&D, our pharmaceutical-grade equipment delivers unmatched performance and compliance.

Lab-Scale Mixers Designed for Nanotech Innovation

PerMix's Lab and R&D mixers are engineered for precision, control, and scalability:

Vacuum Planetary Mixers

Mixers for small-scale high-viscosity nano-dispersions, emulsions, or creams

Laboratory High-Shear Emulsifiers
for nano-emulsion formulation and lipid encapsulation

Vacuum Ribbon Mixers

for gentle but effective blending and drying of sensitive nano-powders

Conical Screw Vacuum Dryers

for uniform drying of nanoscale APIs at low temps

Load Cell Integration

for precision dosing and weight-sensitive formulation development

Recipe Management & Data Logging

with PLC/HMI control—ideal for QA/QC and FDA compliance

Our lab-scale systems are bench-friendly, mobile, and designed to simulate full-scale production performance—ensuring seamless scale-up when your project is

Sanitary, CIP-Ready, and GMP Compliant

PerMix systems are built with 316L stainless steel, polished internals, FDA-compliant seals, and optional air/gas purge systems to protect both product and personnel. Our mixers feature:

- **CIP & SIP compatibility**
- **Vacuum & inert gas options**
- **Full documentation for validation (IQ/OQ)**
- **Custom pharma-grade finishes**

From Lab to Launch: Scalable Equipment for Growing Pharmacies

Whether you're a local compounding facility or a biotech startup preparing for clinical trials, PerMix helps you scale your vision. Our process begins in the lab with fully featured benchtop equipment and scales up seamlessly to pilot or production-level systems—without compromising performance or compliance.

"We started with a PerMix benchtop system and scaled to pilot production effortlessly—same specs, same performance."

— Pharmaceutical R&D Director



Your Partner in Nanotech Innovation



 1(312)883-7432

 John.paul@permixtec.com

 www.permixmixers.com



**Let's Build the Future of
Medicine, Together**

PerMix partners with compounding pharmacies who are innovating at the edge of nanotechnology. Whether you're formulating lipid nanoparticles, micronized suspensions, or sensitive bioactives, we offer the tools, support, and flexibility to help you succeed in today's rapidly evolving pharmaceutical environment.

**Request a Free Application
Review**

**Book a Live Lab Demo or
Virtual Tour**

**Download Technical Specs
& Validation Packages**

PerMix – Setting the Standard in Pharmaceutical Mixing