Streamline development and boost the productivity of your film-coating processes using our digital twin

ALERT: SEE OUR LATEST ARTICLE IN TABLETS & CAPSULES DIGITAL EDITION (22OCT,2023)

Learn more

PCTS diagnostic services detects the health of your tablet-coating processes, assesses feasibility of planned changes, and lays out roadmaps and tools that save you time and money. Unlike other computationally intensive solutions, we create virtualization of your film-coating processes efficiently using our recent scientific breakthroughs, giving you practical insights and solutions quickly and effectively.

Reverse engineer solutions based on your quality, capacity, and cost needs

Who can benefit from our Apps?

- **Executives** looking for cost-of-goods reduction or capital avoidance
- **Process Development** looking to reduce number of variables for DOE during scale up
- **Tech Services** troubleshooting batch deviation
- **Process Engineering** building justifications for technology selection decision
- **Formulation Development** designing tablet shape and assessing process feasibility
- **Quality Assurance** ensuring Right First Time in change management
- **Agencies** assessing the validity of changes being proposed
- **Manufacturing Excellence** looking for Lean year-by-year savings opportunity
- **Operations training** the trainers on film-coating operation for operators and technicians

Request a Demo/Diagnostic Service/Quote

LYNDELL, PA 19354
USA

Particle Coating Technology Solutions

Transform How You Design, Scale, and Troubleshoot Your Tablet-Coating Process

A digital twin that can begin with the results you need, and translates those coating targets into process settings.

See it in Action

A Smarter Way to Optimize Your Coating Process

PCTSUni replaces guesswork and trial-and-error with outcome-first modeling that tells you exactly which process settings will deliver your coating targets. Instead of running experiments to find viable conditions, you can work backward from uniformity, thickness, or weight-gain goals and explore optimized paths instantly. The result: faster, clearer decisions across development, formulation, scale-up, manufacturing, and troubleshooting.

Outcome-First Modeling

Begin with coating targets to calculate optimal conditions

Compare Across Scales & Equipment

Understand performance differences instantly

Troubleshoot with Clarity

Identify drivers of variability without guesswork

The Proven Expertise Behind the Tech

Learn More

10+ peer-reviewed publications

Patent in coating modeling

Training experience with the FDA

Decades of coating research

Contact Us

Experience how outcome-first modeling accelerates coating development and improves performance.

Request a Live Demo

Our vision is to make film-coating technology accessible to all.

Our mission is to serve and equip pharmaceutical industry to efficiently and effectively address film-coating technology challenges with science and engineering.

OUR FOCUS

R&D: Our R&D focus has been to make film-coating science relevant and useful to all levels of R&D, Quality, and Operations. Our effort has resulted in numerous publications and patent. See our latest articles in Tablets & Capsules magazine.

Products: Our recent focus has shifted to building apps for executives, engineers, scientists, technicians, and operator to visualize and utilize key relationships for developing and operating film-coating processes.

Services: We provide diagnostics services and product customizations to meet your specific needs. We recognize that one solution may not fit all. We recognize different measurement units, conventions, and training modules are used around the world. We are here to address these customization needs as well as consultations to make application of science easier for product formulation, process design and development, tech transfer, or troubleshooting.

TEAM

01
Michael Choi

Process expert and inventor of the simulation tools. Doctoral dissertation included modeling and experimental verification of batch and continuous coating processes. Holds a patent on tablet coating uniformity simulator.

02
Stuart C. Porter

World-renowned coating formulation and process expert with a wealth of experience in the film-coating technologies. Author of numerous articles and chapters in textbooks on film-coating technologies.

03
Axel Meisen

World-renowned expert in modeling coating and particulate systems, Professor Emeritus at the University of British Columbia

What we do

Provide expertise and scientific/engineering tools to establish feasibility and measures for...

- process and technology design and transfer
- product development and registration
- manufacturing and pilot-plant operations

Who we serve

- formulators, QA, technicians, operators, and process engineers in pharma, food and chemical industries
- new equipment and device technology developers
- manufacturing excellence, supply-chain and executives seeking to improve cost of goods

Where we add value

Bring cost effective solutions by developing scientific tools, systems, and consultation in

- process diagnostics
- training
- process design and development
- troubleshooting
- formulation design

About Us

Our mission is to deliver practical value by resolving film-coating challenges with a rigorous, scientific, and engineering-driven approach.

Our Vision

Film-coating technology that is accessible, understandable, and practical for every level of the pharmaceutical industry.

Our Focus

R&D

We invest in research that makes film-coating science useful in real development and manufacturing environments. Our work has produced numerous peer-reviewed publications, a patent in coating modeling, and contributions to industry training.

See our recent article featured in *Tablets & Capsules* magazine.

Products

We develop applications that turn complex coating relationships into clear, actionable insights. Designed for executives, engineers, scientists, technicians, and operators, the tools we build help teams visualize how their coating processes behave and make better decisions during design, scale-up, and daily operations.

Services

Our diagnostics and customization services adapt PCTSUni to your site's conventions, training needs, and operating realities. Whether you are developing a new tablet formulation, transferring technology, or troubleshooting a recurring issue, we help make scientific principles easier to apply.

Meet the Team

Michael Choi, PhD

Process expert and inventor of the simulation tools. Doctoral dissertation included modeling and experimental verification of batch and continuous coating processes. Holds a patent on tablet coating uniformity simulator.

Axel Meisen, PhD

World-renowned expert in modeling coating and particulate systems, Professor Emeritus at the University of British Columbia.

Stuart C. Porter, PhD

World-renowned coating formulation and process expert with a wealth of experience in the film-coating technologies. Author of numerous articles and chapters in textbooks on film-coating technologies.

We provide expertise and scientific/engineering tools that support:

Process and technology design and transfer

Product development and regulatory readiness

Manufacturing and pilot-plant operations

Who We Serve

- Formulators, QA/QC teams, technicians, operators, and process engineers
- Pharmaceutical, food, and chemical product developers
- Equipment and device manufacturers
- Manufacturing excellence, supply-chain teams, and executives focused on reducing COGs

We Deliver Cost-Effective, Science-Driven Solutions Across:

- Process diagnostics and design
- Troubleshooting and root-cause analysis
- Training for operators, engineers, and technical teams
- Formulation and coating design

Learn what PCTS can do for you.

Contact Us

Services

... serve the pharmaceutical industry tackle film-coating technology challenges creatively, efficiently, and effectively with science and engineering. Better, faster, cheaper...

DIAGNOSTICS SERVICE

What you get: a diagnostics report

What's included:

- Capacity and cost optimization potential
  - Based on batch size variation
  - Based on coating weight gain variation
- Film thickness distribution
  - Film thickness density
- Sensitivity analysis of coating environment
  - 3-D plots of temperatures, flow rates, and humidities
  - Impact of inlet air dew point on coating humidity
- Characterization of process efficiencies
  - Coating deposition efficiency based on material balance
  - Thermal efficiency (heat loss) based on energy balance
  - Spray distribution efficiency based on coating uniformity
- Physical properties of
  - Tablet shape, volume, and densities
  - Heat capacities and latent heat of vaporization
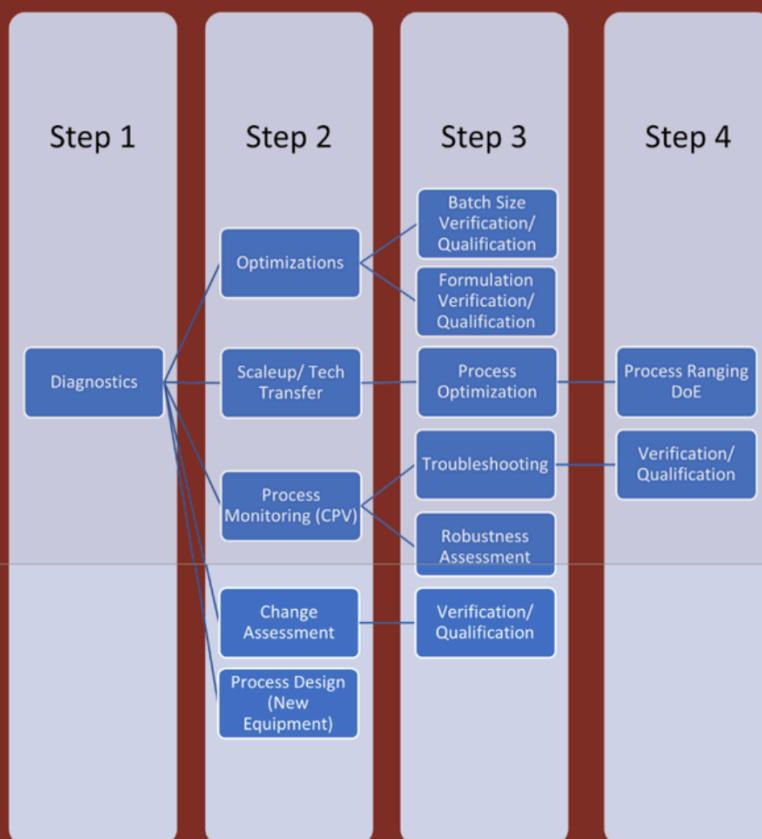 - Lower explosion limit for solvents

What you need:

- Formulation properties
  - Tablet weight gain
  - Tablet dimensions and properties
  - Coating solution solids content
- Equipment dimensions
- Processing conditions

How long: estimated 15-30 min (assistance provided)

How much: $99 introductory price

Contact customer.support@particlecoating.com for input template and sample report. Assistance will be provided to help setup the input file.

Step 1	Step 2	Step 3	Step 4
Diagnostics	Optimizations	Batch Size Verification/ Qualification	
		Formulation Verification/ Qualification	
	Scaleup/ Tech Transfer	Process Optimization	Process Ranging DoE
		Troubleshooting	Verification/ Qualification
	Process Monitoring (CPV)	Robustness Assessment	
	Change Assessment	Verification/ Qualification	
	Process Design (New Equipment)		

POPULAR PRODUCT LIFECYCLE ACTIVITIES

Other Services - we guarantee better, faster, cost-effective solutions

Contact customer.support@particlecoating.com for details on digital twin support for product lifecycle activities.

A Digital Twin Purpose-Built for Tablet Coating

PCTSUni helps you design, scale, and troubleshoot tablet coating by starting with the results you need—then calculating the process conditions required to achieve them.

See It In Action

Start With Your Desired Outcome— **PCTSUni** Does The Rest

Unlike traditional simulators that only predict outcomes after you choose inputs, **PCTSUni** uses inverse modeling to work backward from your coating targets. By computing the settings required to deliver uniformity, film thickness, and weight gain, **PCTSUni** supports faster, more confident decisions across R&D, scale-up, **manufacturing, and troubleshooting.**

PCTSUni brings all major coating relationships (formulation, airflow, humidity, atomization, thermodynamics, pan motion, and equipment geometry) into a single environment so you can explore, compare, and optimize with clarity.

What You Can Do With PCTSUni

Optimize tablet coating using inverse modeling

Start with the CQAs you need; **PCTSUni** outputs the required process conditions.

Compare formulations, processes, and equipment

Understand how tablet properties, pan dimensions, airflow, temperature, humidity, or equipment design impact outcomes.

Troubleshoot faster

Pinpoint parameters driving variability and reveal how multiple factors interact.

Strengthen process understanding across teams

Visualize coating behavior for formulators, engineers, operators, QA/QC, and leadership.

Designed For Real World Operations

Inverse-modeling engine computes the conditions needed to meet desired coating targets.

Connected physics-based models for coating efficiency, thermodynamics, and uniformity.

Instantaneous scenario exploration.

Operational analysis: cycle time and cost of goods.

Human-centric design supports users at every experience level.

Backed by decades of research, publications, and patented innovations.

Optimize your tablet coating from the inside out.

See how a user-centric digital twin transforms coating formulation and process development, scaleup, and manufacturing operations.

Request A Live Demo

Contact Us

Understand your coating process today. Optimize it for tomorrow.

Let's talk about your coating challenges.

Whether you're troubleshooting variability, preparing for scale-up, evaluating a new formulation, or exploring how a digital twin could support your operations, our team is here to support you.

How we can help:

- Questions about **PCTSUni** or a potential demo
- Support for process diagnostics or troubleshooting
- Guidance on formulation, scale-up, or tech-transfer challenges
- Training needs for operators, engineers, or technical teams
- Requests related to coating modeling, process understanding, or site-specific customization

Name

First Name *

Last Name *

Email *

Company Name *

Industry *

Select an option ⌄

Interests *

Coating Formulation   Process Development

Scaleup/Tech Transfer   Manufacturing   Troubleshooting

QA   Continuous Improvement

Comments (optional)

SUBMIT

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