QUANTUMX™ ELITE SERIES

PLOUGHSHARE MIXERS & PROCESSORS

High-intensity mixing, granulation, coating, drying and reaction systems

HIGH INTENSITY | UNIFORM RESULTS | CLEANABLE DESIGN | PROCESS CONTROL

Engineered for demanding powder and particulate processes where speed, uniformity, cleanability and process control matter most.











HOW IT WORKS

MECHANICALLY FLUIDIZED MIXING

Each plough tool lifts, accelerates and disperses product into a three-dimensional fluidized zone. The result is fast, repeatable blending with efficient incorporation of liquids, minor ingredients and functional additives.



Rapid turnover and short batch cycles

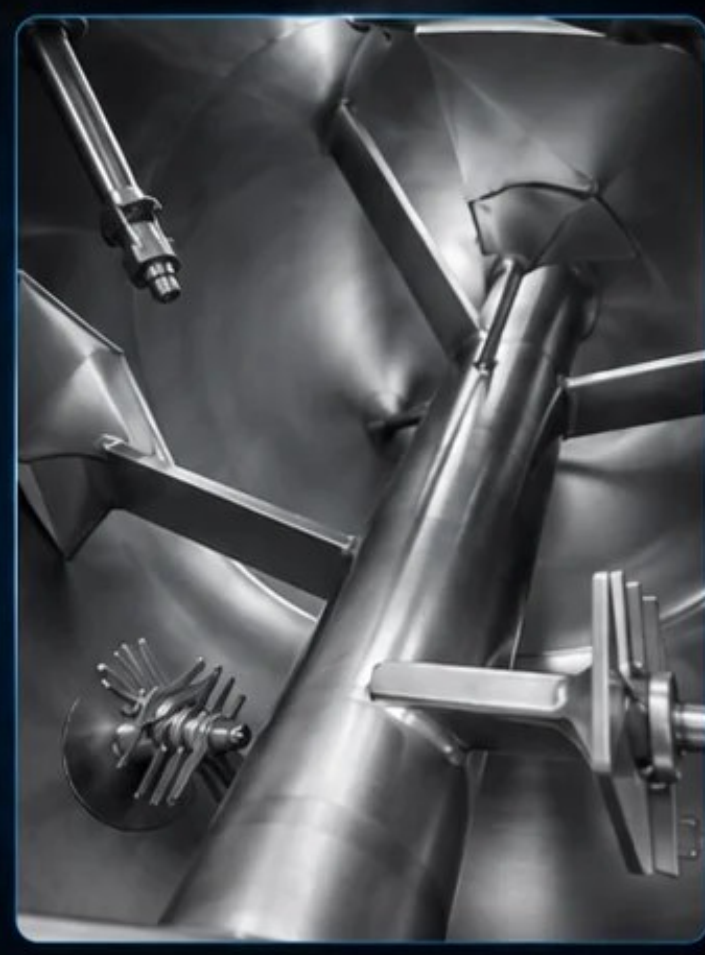
Excellent homogeneity, even with low-dose additions

Ideal for dry blending, coating, deagglomeration and granulation

INSIDE THE MIXING ZONE

- Plough tools generate intense product movement
- High-speed choppers break lumps and distribute liquids
- Spray nozzles support controlled coating and agglomeration





PROCESS CAPABILITIES

ENGINEERED FOR MORE THAN BLENDING

QuantumX ploughshare systems are configured to do more than mix. They can condition, coat, granulate, deagglomerate, dry and react—allowing one platform to support multiple process objectives.



01 **Dry Blending**
Fast, uniform mixing across broad bulk-density ranges



02 **Liquid Addition**
Controlled spray application with excellent distribution



03 **Granulation**
Reliable agglomeration and binder incorporation



04 **Coating**
Even surface treatment for powders and particulates



05 **Vacuum Drying**
Moisture reduction in enclosed processor configurations



06 **Reaction / Thermal Processing**
Heating, cooling and inerted process options



CONFIGURATIONS

BUILT AROUND YOUR PROCESS

From compact development units to large production processors, QuantumX configures ploughshare technology around your material behavior, cleaning requirements and line architecture.

QX-PTS
BATCH MIXER

The versatile standard for high-intensity batch blending



QX-PTSC
CONTINUOUS MIXER

Continuous throughput for streamlined production lines



QX-PTSP
PROCESSOR

Integrated platform for mixing, conditioning, drying and reaction



QX-PTSH
HYGIENIC DESIGN

Easy-clean execution for sanitary and validation-driven environments



HEATING/ COOLING JACKETS | VACUUM SYSTEMS | LIQUID-ADDITION SKIDS | CHOPPERS | INERTING | CIP/WIP | SIEMENS AUTOMATION

Available with heating/cooling jackets, vacuum systems, liquid-addition skids,

WHY QUANTUMX

WHY LEADING PLANTS SPECIFY QUANTUMX

When process outcomes matter, machine selection must go beyond a nameplate. QuantumX combines **application-led engineering, cleanable construction and performance-defined execution** to help plants run with greater confidence.



Application-Led Engineering
We build around the product, not a generic catalog template

Performance-Defined FAT
Acceptance criteria are aligned before final approval

Cleanable Construction
Access, finishes and options that support real production cleaning

Automation & Control
Siemens-based controls, recipes, alarms and process visibility

Global Execution
Startup, training, documentation and long-term support





> “Your product writes the specification.

SCALE & SUPPORT

FROM LAB TO PRODUCTION SCALE

QuantumX ploughshare technology scales from development work to full production systems—supported by application engineering, testing strategy, automation and lifecycle support.



CAPACITY RANGE

From compact development units to production systems exceeding 5,000 liters.

IDEAL FOR

Food ingredients, nutraceuticals, specialty chemicals, minerals, battery materials, additives and performance powders.

PROJECT SUPPORT

Testing guidance, process definition, FAT, startup, training, spares and long-term technical support.

TELL US THE MATERIAL.
WE WILL BUILD THE PROCESS AROUND IT.

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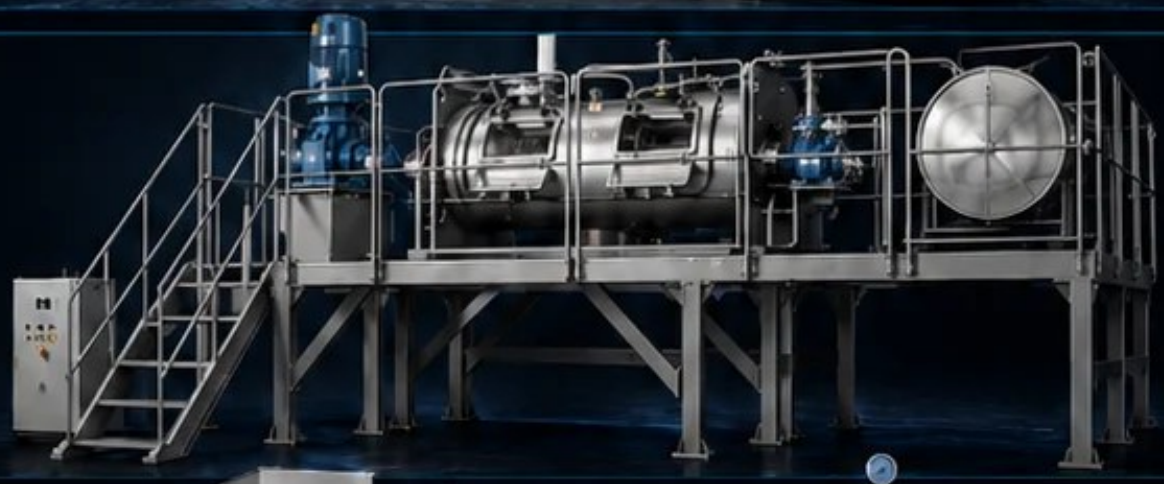

QX-PTSH
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Easy-clean execution for sanitary and validation-driven environments



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VACUUM PROCESSING

VACUUM MIXING & DRYING

Blend, condition, strip solvents and dry in one controlled vessel.



PLOUGHSHARE ACTION

Gentle yet intensive mixing, agglomeration and drying with continuous material turnover and consistent residence time.



1. ONE VESSEL, MULTIPLE DUTIES

Mixing, agglomeration, vacuum drying, solvent stripping and post-reaction finishing in a single platform.

2. LOWER THERMAL STRESS

Jacketed heat transfer plus vacuum evaporation supports faster moisture removal at gentler product temperatures.

3. PROCESS CONTROL THAT SCALES

Integrated vacuum, condensers, inerting, choppers and liquid-addition systems engineered around the material.

4. DEFINED END-POINTS

Tight control of residual moisture, residual solvent and final powder condition for repeatable batch results.

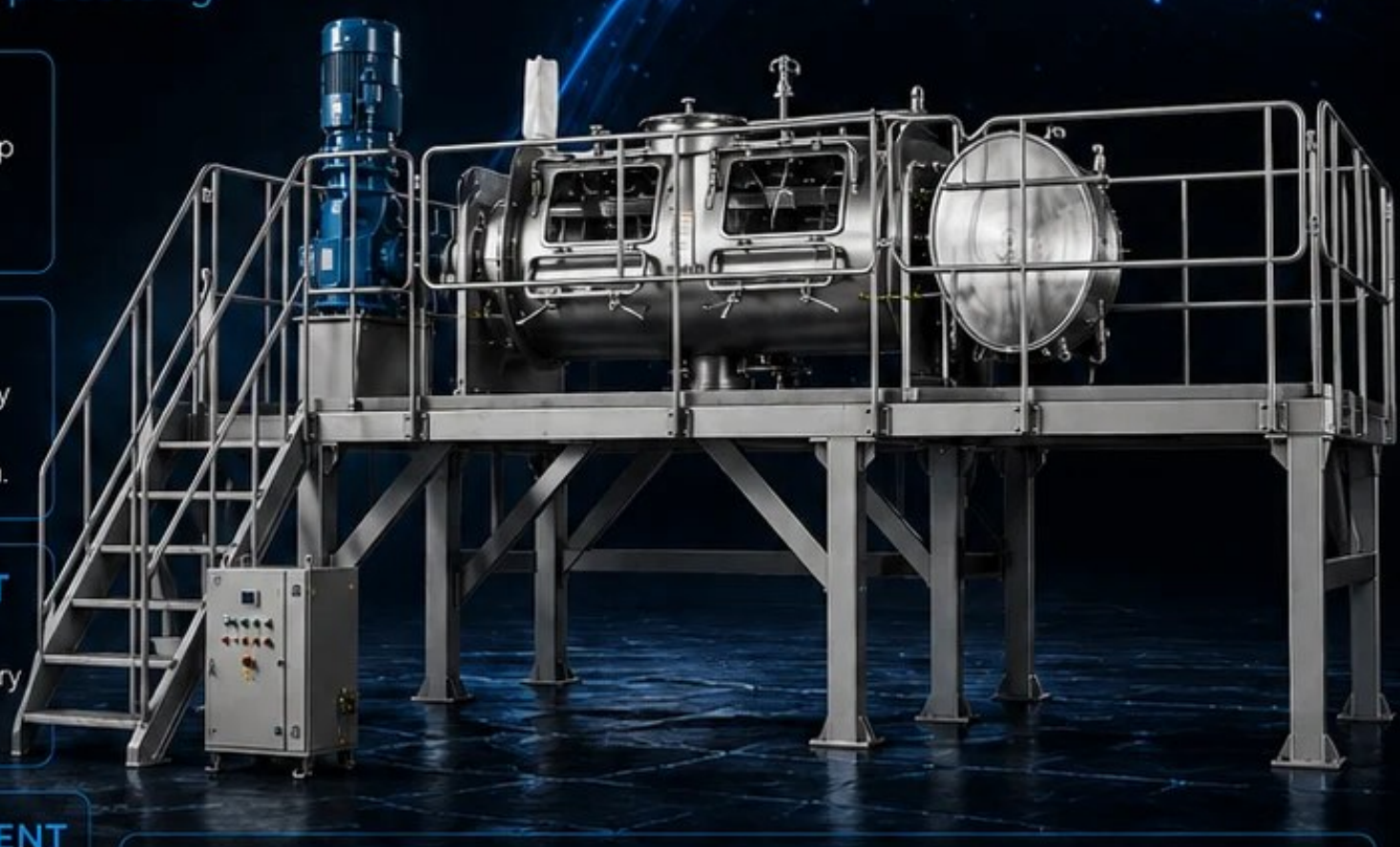
VACUUM SYSTEMS | HEATING / COOLING JACKETS | CONDENSER INTEGRATION | SOLVENT RECOVERY | INERTING | CHOPPERS | SIEMENS AUTOMATION

WHEN DRYING PERFORMANCE MATTERS, QUANTUMX ENGINEERS THE ENTIRE PROCESS – NOT JUST THE MIXER.

POWDER TRANSFORMATION

FROM MIXING TO REACTION

QuantumX processors turn powders into finished performance materials through controlled thermal, mechanical and liquid-phase processing.



STERILIZING
Deliver a controlled kill step while protecting powder integrity.

INSTANTIZING
Improve wetting, sinkability and dispersion through engineered agglomeration.

pH ADJUSTMENT
Apply liquids uniformly for consistent product chemistry across the batch.

COLOR ADJUSTMENT
Achieve controlled powder coating and uniform visual standardization.

GRANULATING
Build stronger, more consistent granules with choppers, binders and precise process control.

CONTROLLED TRANSFORMATION. CONSISTENT RESULTS.



WHY QUANTUMX LEADS



1. ENGINEERED FOR THE MATERIAL
Mixing intensity, residence time, liquid-addition strategy and heat transfer are configured to the application.

2. MORE THAN A BLENDER
One system can mix, react, condition, granulate, dry and cool.

3. PROCESS INTEGRATION
Vacuum, jackets, spray systems, condensers and automation are fully integrated.

4. SCALE-UP CONFIDENCE
From trials to production, QuantumX links process definition to full-scale results.

WHEN POWDERS MUST CHANGE — NOT JUST BLEND — QUANTUMX BUILDS THE REACTOR AROUND THE RESULT.

HYGIENIC DESIGN & COMPLIANCE

BUILT FOR VALIDATED ENVIRONMENTS

Cleanability, access and digital control architecture designed for sanitary and regulated processing.



EASY-CLEAN ACCESS

Large doors and full operator access simplify inspection, washdown and verification.

SANITARY CONSTRUCTION

316L product-contact surfaces, polished finishes and hygienic details support demanding applications.

CIP / WIP READY

Spray devices, drainable geometry and clean-in-place / wash-in-place options reduce downtime.

CONTAINMENT & TRACEABILITY

Controlled charging, discharge and batch documentation support consistent operations.

21 CFR PART 11 COMPLIANCE

Siemens-based automation can be configured for user access control, audit trails, electronic records, recipe security and e-signature workflows.





IDEAL FOR

NUTRACEUTICALS | PHARMA | FOOD INGREDIENTS | SPECIALTY CHEMICALS | BATTERY MATERIALS

HYGIENIC MECHANICAL DESIGN IS ONLY HALF THE SOLUTION—
QUANTUMX CONNECTS CLEAN PROCESSING WITH DIGITAL COMPLIANCE.

SANITARY DESIGN OPTIONS

EASY-CLEAN ACCESS

Engineered to reduce confined-space cleaning, shorten maintenance time and simplify validation in regulated processing environments.

NO CONFINED SPACE ENTRY

Optional cantilevered, shaft-withdrawal and full-access designs allow operators to clean and inspect without entering the vessel.

FASTER CHANGEOVERS

Wide doors, open geometry and easier part access reduce washdown time, shorten dry-down and speed product-to-product transitions.

LOWER MAINTENANCE TIME

Simplified access to seals, choppers, spray devices and internal components helps cut service hours and improve uptime.

AUDIT-READY HYGIENE

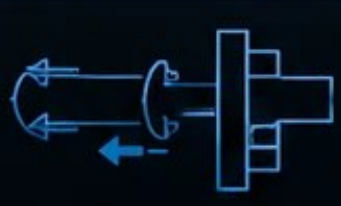
Supports SQF, HACCP and sanitary processing programs with improved visibility, cleanability and documented inspection access.

FDA / USDA-ALIGNED DESIGN

316L product-contact surfaces, drainable details, polished finishes and validation-friendly access support demanding food and regulated applications.



EASY-CLEAN OPTIONS



Shaft Withdrawal Design



Full-Access Side Door



Hinged Inspection Covers



Spray Bar / CIP Integration



Quick Access to Seals & Internals

WHY OPERATORS PREFER IT

1. **Safer Cleaning**
   Minimizes vessel entry and improves operator ergonomics.
2. **Better Compliance**
   Supports sanitation verification and inspection readiness.
3. **More Uptime**
   Less time cleaning and maintaining means more time producing.
4. **Higher Product Integrity**
   Improved cleanout reduces cross-contamination risk between batches.

CLEAN FASTER. VERIFY EASIER. PRODUCE MORE.

QUANTUMX™ ELITE SERIES

ENGINEERED AROUND YOUR PROCESS

QuantumX builds ploughshare mixers, continuous processors, vacuum dryer-reactors and sanitary Easy-Clean systems for demanding powder transformation applications.



WHY QUANTUMX

1. Application-led engineering
2. Batch & continuous solutions
3. Vacuum drying, reaction & granulation
4. Sanitary Easy-Clean designs
5. Automation, validation & scale-up support

LET'S DEFINE THE PROCESS AROUND YOUR MATERIAL.