



RIBBON MIXERS, VACUUM RIBBON MIXERS & DRYERS

Not all ribbon mixers are the same. Ribbon width, pitch and swept surface area decide how fast a batch reaches uniformity – and whether it stays uniform on discharge. This is how we engineer that geometry.

5 L - 30,000 L BATCH & CONTINUOUS HORIZONTAL & VERTICAL VACUUM DRYING

QuantumX

SPECIFY THE GEOMETRY, NOT JUST THE VOLUME

Two mixers of the same nominal volume can differ by a factor of three in blend time and by an order of magnitude in discharge segregation. The difference is not the badge on the drive guard. It is ribbon width, helix pitch, radial clearance, swept surface area per unit volume, and the tip speed those choices imply.

QuantumX builds each ribbon set around the product it will handle – bulk density and its spread, particle size distribution, cohesivity, friability, liquid load, and the coefficient of variation your process has to hold. Where drying, cooking or solvent recovery is part of the duty, the same body becomes a jacketed vacuum mixer/dryer.



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5 – 30,000

LITRES TOTAL VOLUME

CV < 5%

TYPICAL BLEND TARGET

6 bar

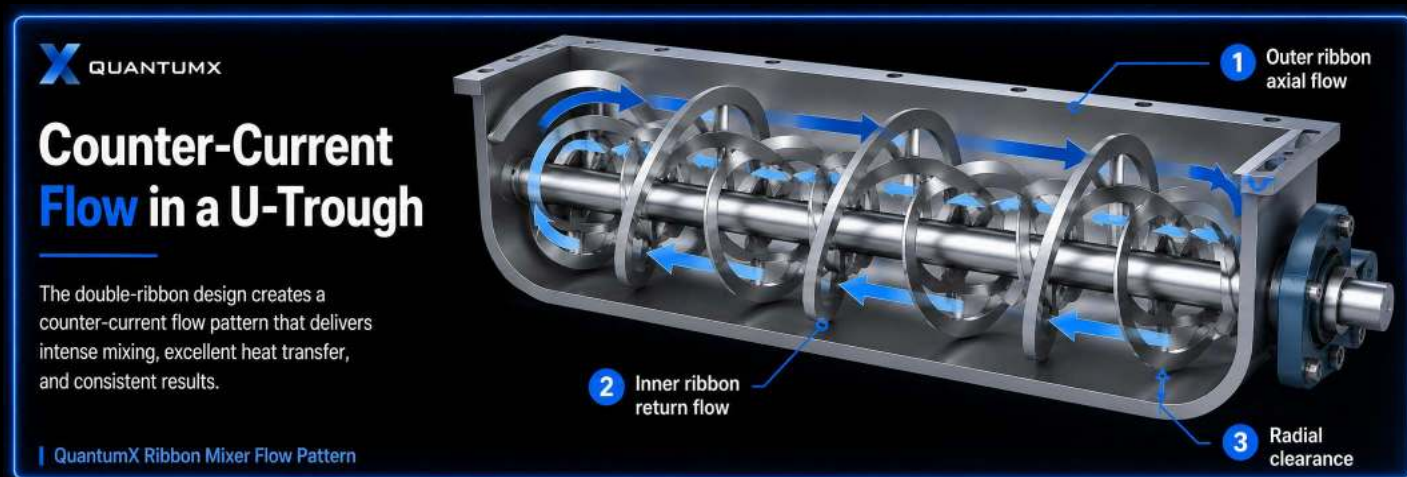
ASME JACKET RATING

10 mbar

VACUUM, ABSOLUTE

HOW A RIBBON MIXER WORKS

A ribbon agitator is a pair of nested helices turning on one shaft. The outer helix conveys product axially in one direction; the inner helix, wound the opposite hand at a smaller diameter, returns it. The two flows meet and fold continuously – convective macro-mixing – while the trough wall and the ribbon's radial clearance produce the shear that breaks down agglomerates. Uniformity is reached by displacement, not by violence, which is why ribbon mixers hold friable particles and coated granules intact.



AXIAL TRANSPORT

The outer ribbon moves the bulk of the charge end-to-end. Its pitch sets how far product travels per revolution, and therefore how many passes a batch makes per minute.

COUNTER-CURRENT RETURN

The inner ribbon returns roughly the same mass flow against it. The opposing streams create the shear plane where minor ingredients are distributed.

RADIAL EXCHANGE

Ribbon width and clearance to the wall govern the thin layer that is scraped and lifted each pass – the mechanism that eliminates dead zones at the trough radius.

DESIGN CONSEQUENCE

Blend time is set by the number of complete circulations, not by elapsed minutes. Two geometries at the same RPM can differ by 3× in circulations per minute. Specifying RPM without specifying pitch and ribbon width tells you almost nothing about mixing performance.

NOT ALL RIBBON MIXERS ARE THE SAME

Quoted volume, motor power and RPM are the three numbers most often compared, and they are the three least predictive of blend quality. What determines whether a batch reaches CV < 5% in four minutes or in eighteen is the ribbon geometry: how wide the flight is, how steeply it is wound, and how much swept surface it presents per litre of product.

01

RIBBON WIDTH

The flight width, expressed as a fraction of agitator diameter, sets the mass displaced per revolution and the depth of the layer sheared against the wall. Narrow flights cut through the bed and generate localised shear; wide flights move a larger, gentler volume.

Narrow 0.08 – 0.10 D • fine cohesive powders, high shear demand

Wide 0.14 – 0.18 D • friable granules, low attrition

02

PITCH

Pitch is the axial advance per revolution, and it governs circulation rate. A long pitch conveys quickly and empties fast but folds less per pass; a short pitch folds aggressively but circulates the batch more slowly. Inner and outer pitch are set independently so the two mass flows balance – an unbalanced pair produces a standing accumulation at one end of the trough.

Long 1.0 – 1.2 D • free-flowing, fast transfer

Short 0.5 – 0.7 D • cohesive, liquid addition, pastes

03

SWEPT SURFACE AREA

Total ribbon surface per litre of working volume is the single best proxy for how much of the batch is actively worked at any instant. It also sets the wall coverage that matters in a jacketed machine: in a heated or vacuum-dried duty, swept area per litre is what turns jacket temperature into actual product heat transfer.

Standard double ribbon, single set

High-area intermeshing or ribbon + paddle, up to ~1.8× swept area

ASK FOR THE GEOMETRY. On every QuantumX quotation the ribbon set is defined by flight width, inner and outer pitch, radial clearance and calculated tip speed – the numbers that let you compare machines rather than brochures.

MATCHING RIBBON GEOMETRY TO THE PRODUCT

The table below is the starting point our engineers work from. Final geometry is confirmed against a sample of your material, either in trial or from a full particle and flow characterisation.

PRODUCT CHARACTER	RIBBON CONFIG.	FLIGHT WIDTH	PITCH	TIP SPEED	TYPICAL BLEND TIME
Free-flowing dry powders	Standard double ribbon	0.10 – 0.12 D	1.0 D	1.6 – 2.2 m/s	3 – 6 min
Cohesive / fine powders < 20 µm	Intermeshing double ribbon	0.08 – 0.10 D	0.6 – 0.8 D	2.0 – 2.6 m/s	6 – 12 min
Friable granules, coated pellets	Single ribbon with rods	0.14 – 0.18 D	1.0 – 1.2 D	1.0 – 1.5 m/s	4 – 8 min
Micro-ingredients at < 0.1% w/w	Double ribbon + chopper	0.10 D	0.7 D	2.0 – 2.6 m/s	8 – 15 min
Powder + liquid, 5 – 25% addition	Ribbon + paddle combo	0.12 D	0.6 D	1.6 – 2.0 m/s	8 – 20 min
Pastes, doughs > 50,000 cP	Heavy paddle-ribbon	0.16 – 0.20 D	0.5 D	0.8 – 1.2 m/s	10 – 25 min
Abrasive minerals, hard granules	Double ribbon, hardfaced	0.12 D	1.0 D	1.2 – 1.6 m/s	4 – 8 min

RADIAL CLEARANCE

Outer flight to trough wall is held at 3 – 8 mm depending on diameter and particle size. Too tight and abrasive particles gall the wall; too loose and a stagnant film survives every pass, which is the usual cause of a batch that will not close the last percent of CV.

FILL RATIO

Horizontal troughs mix correctly between 40% and 70% of total volume. Below 40% the charge sits under the shaft and axial flow collapses; above 70% the bed cannot lift and mixing degrades to slow diffusion. Every model in this brochure is tabulated at both bounds.

MIXING ENERGY AND BLEND VALIDATION

Three dimensionless quantities describe what a ribbon set is doing to your product, and one statistic describes whether it worked. We report all four.

TIP SPEED

0.8 – 2.6 m/s

$\pi \cdot D \cdot n$. The direct measure of mechanical stress at the flight edge. Above roughly 2.6 m/s attrition of granules and de-lamination of coated particles become measurable; below 1.0 m/s cohesive powders will not fluidise into the fold.

FROUDE NUMBER

Fr 0.3 – 1.0

$n^2 \cdot D / 2g$. Ribbon mixing is a gravity-dominated regime: the bed must fall back into the fold rather than be thrown. Fr is held below 1 and scaled as the constant when moving a recipe from a 50 L trial machine to production.

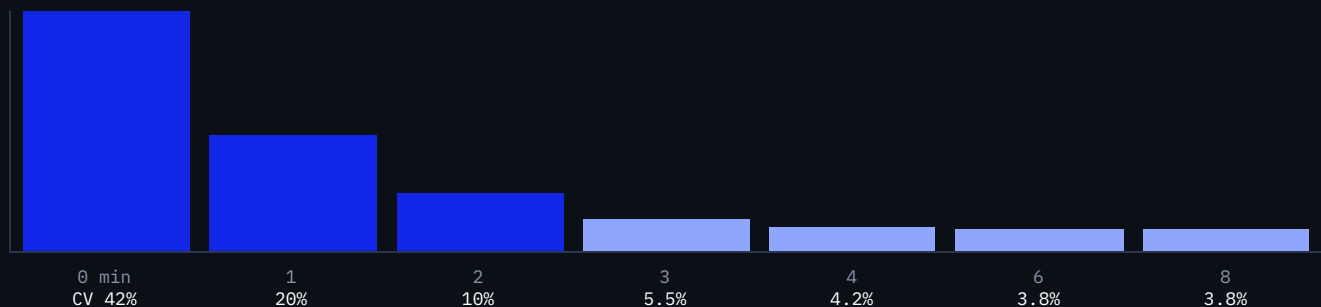
SPECIFIC ENERGY

1 – 4 kWh/t

Net energy into the bed per tonne blended. Dry blending sits at the low end; wetted or heated duties climb. This is the figure to use when comparing operating cost between mixer types, not installed motor rating.

COEFFICIENT OF VARIATION

CV is the standard deviation of a tracer concentration across a set of samples, divided by the mean. It falls steeply at first as convective mixing distributes the charge, then flattens as the remaining unmixedness becomes diffusive. The knee of that curve is the correct mix time; running past it adds attrition and, in segregating blends, can raise CV again.



Representative curve – 1,000 L double ribbon, free-flowing powder, 0.5% tracer, 10 samples per interval by thief probe.

TRIAL AND ACCEPTANCE

QuantumX runs your material in a pilot machine, establishes the CV curve, fixes the geometry and mix time, and writes the resulting acceptance criteria into the order. The production machine is then FAT-tested against the same tracer method before shipment.

BATCH OR CONTINUOUS

A ribbon geometry can be operated either way, but the two modes solve different problems. Batch mixing controls a defined mass to a defined uniformity and gives you a discrete, traceable lot. Continuous mixing controls a mass flow rate and trades lot identity for throughput and a much smaller machine.

MODE A

BATCH RIBBON MIXING

The trough is charged to 40–70% fill, mixed for a validated time, and discharged completely through a full-length bomb-bay or slide gate. Every lot has its own record.

- + Defined lot identity and full traceability
- + Recipe changeovers between every batch
- + Handles micro-ingredients below 0.1% reliably
- + Liquid addition, heating, cooling and vacuum drying all possible in the same vessel
- Charge and discharge time is non-productive
- Larger vessel and headroom for a given tonnes/hour

MODE B

CONTINUOUS RIBBON MIXING

Gravimetric or volumetric feeders meter each stream into one end of a tubular ribbon body. Mixing quality is set by residence time and geometry; product leaves at the far end at a steady rate.

- + High throughput from a compact machine
- + No charge/discharge dead time, steady power draw
- + Integrates directly with extruders, pelletisers, packing lines
- + Adjustable weirs and paddle sections tune residence time
- Blend accuracy depends entirely on feeder accuracy
- Lot definition is by time window, not by vessel

CONTINUOUS RESIDENCE
TIME

20 – 180 s

THROUGHPUT RANGE

0.5 – 60 t/h

FEEDER ACCURACY
REQUIRED

± 0.5%

ACHIEVABLE CV

3 – 7%

BATCH VS. CONTINUOUS — DECISION TABLE

Read down the left column for the constraint that governs your process. Where both columns are marked, either mode will work and the decision moves to capital and floor space.

REQUIREMENT	BATCH	CONT.	NOTES
Discrete lot traceability	●	○	Regulated pharma and infant nutrition generally require a vessel-defined lot.
Frequent recipe changes	●	○	Continuous lines lose product to transition every changeover.
Throughput above 15 t/h	○	●	Batch is possible but needs multiple vessels and surge hoppers.
Micro-ingredient < 0.1% w/w	●	◐	Continuous requires loss-in-weight micro-feeders and a premix stage.
Liquid addition > 10%	●	◐	Batch gives the residence time needed for absorption and de-lumping.
Heating, cooling or drying in the mixer	●	○	Thermal duties need controlled residence time — see pages 12–14.
Vacuum operation	●	○	A continuous machine cannot hold vacuum across open feed and discharge.
Steady 24/7 single product	◐	●	Continuous wins clearly on energy per tonne and labour.
Minimum installed footprint	○	●	A continuous body of the same duty is typically a quarter of the volume.
Full washdown between products	●	◐	Batch troughs open fully for CIP or manual cleaning; see page 16.
Abrasive minerals	●	●	Both available in Hardox® or hardfaced execution.
Lowest capital for < 5 t/h	●	◐	Continuous only pays back once feeders and controls are amortised.

● PREFERRED ◐ POSSIBLE WITH PROVISIONS ○ NOT RECOMMENDED

QUANTUMX™

HORIZONTAL RIBBON MIXER



SUPERIOR MIXING PERFORMANCE

Dual ribbon agitators provide efficient, consistent blending for a wide range of dry and moist materials.



BUILT TO LAST

Heavy-duty construction and precision engineering ensure reliability and long service life.



EASY TO CLEAN & MAINTAIN

Large access doors, smooth surfaces, and full drain design minimize downtime and simplify sanitation.



SAFE & SECURE

Interlocked safety switches, secure latches, and optional safety features protect your team and your process.



05 • MACHINES

QuantumX

HORIZONTAL RIBBON MIXERS

A U-shaped trough with a nested double-helix agitator on a single horizontal shaft. This is the reference design for bulk blending: the geometry produces strong axial and radial exchange at low tip speed, and the full-length discharge empties the batch without a residual heel. Available 5 L to 30,000 L total volume.

STRENGTHS

- + Fastest route to CV < 5% on most dry blends
- + Complete discharge through full-length bomb-bay doors
- + Low headroom – fits under existing silos and bag dumps
- + Widest option set: jackets, chopper, liquid injection, vacuum
- + Handles pastes and high liquid loads other geometries cannot

CONSTRAINTS

- Larger floor area than a vertical of equal volume
- Correct operation needs 40-70% fill; part-batches mix poorly
- Shaft seals are wetted – specify sealing for the duty (page 16)

WORKING FILL

40% – 70% of total

SERIES

PRB

VOLUME

5 – 30,000 L

BLEND TIME

3 – 8 min

SPECS

Page 17

QUANTUMX™

VERTICAL RIBBON MIXER

EFFICIENT VERTICAL MIXING
Gentle yet thorough blending with vertical ribbon agitation for consistent, homogeneous results.

SUPERIOR DESIGN
Engineered for durability, reliability, and long-term continuous operation.

VERSATILE & CUSTOMIZABLE
Ideal for powders and dry blends across food, pharmaceutical, chemical, and specialty industries.

CLEAN & EASY TO MAINTAIN
Sanitary construction and easy-clean design for quick product changeovers and minimal downtime.

QX
QUANTUMX™
ENGINEERED FOR EXCELLENCE

VERTICAL RIBBON MIXERS

A conical or cylindrical vessel with a vertical helical ribbon. Product is lifted at the wall and cascades down the centre under gravity, so mixing energy per unit mass is low and particle damage is minimal. The vessel stands on its own footprint and discharges by gravity through a bottom valve, which makes it the natural choice where floor space is the binding constraint or the product cannot tolerate shear.

STRENGTHS

- + Smallest floor footprint per litre
- + Gentlest action – lowest attrition of fragile particles
- + Gravity discharge, no residual heel in a conical bottom
- + Tolerates part-batches down to ~30% fill
- + Lower installed power for the same volume

CONSTRAINTS

- Longer blend time than an equivalent horizontal
- Not suited to high-viscosity pastes or heavy liquid loads
- Needs headroom – charge point sits high above discharge

WORKING FILL

30% – 70% of total

SERIES	VOLUME	BLEND TIME	SPECS
PVR	15 – 30,000 L	8 – 20 min	Page 18

HORIZONTAL VS. VERTICAL RIBBON MIXERS

Both geometries are ribbon mixers and both reach the same uniformity target. They differ in how fast they get there, what they cost in floor space, and how much stress they put on the particle.

ATTRIBUTE	HORIZONTAL · PRB	VERTICAL · PVR
Mixing action	Counter-current axial + radial, forced	Wall-lift and gravity cascade
Typical blend time	3 – 8 min	8 – 20 min
Tip speed	1.2 – 2.6 m/s	0.8 – 1.6 m/s
Particle attrition	Low to moderate; geometry-dependent	Lowest of any ribbon geometry
Working fill window	40 – 70%	30 – 70%
Floor area, 1,000 L	Larger — long trough plus drive	Roughly 40% of the horizontal
Headroom needed	Low	High — 2.6 to 3.2 m at 1,000 L
Installed power, 1,000 L	11 kW	7.5 kW
Discharge	Full-length bomb-bay or slide gate	Gravity through bottom valve
Discharge time, 1,000 L	Fast — bed drops in seconds	Slower, flow-rate limited
Liquid addition	Up to 25%+ with paddles and chopper	Light additions only, ≤5%
Pastes & high viscosity	Yes, with paddle-ribbon execution	Not recommended
Jacketed heating / cooling	Highest heat-transfer area per litre	Available; lower area per litre
Vacuum execution	PRBD series	PVRD series
CIP / cleanability	Good with spray bars and stub shaft	Excellent — self-draining vessel
Best fit	Large dry blends, wetted and thermal duties, fastest cycle	Tight floor space, fragile or segregating product, small to mid batches

VACUUM RIBBON MIXERS & DRYERS

Pull the vessel down to 10–100 mbar absolute and water boils between 7 °C and 46 °C. That single fact is why a vacuum ribbon mixer/dryer can strip moisture or solvent from a heat-sensitive product at jacket temperatures a conventional dryer cannot approach — while the ribbon keeps the bed turning so every particle sees the heated wall and no crust forms.

ABSOLUTE PRESSURE	WATER BOILS AT	TYPICAL USE
1013 mbar	100 °C	Atmospheric reference
200 mbar	60 °C	Light de-dusting, degassing
100 mbar	46 °C	Food powders, botanicals
50 mbar	33 °C	Proteins, enzymes, probiotics
20 mbar	18 °C	APIs, solvent recovery
10 mbar	7 °C	Battery materials, deep drying

Saturation temperature of water. Solvent systems follow their own vapour-pressure curve — specify the solvent at enquiry.



ONE VESSEL, THREE DUTIES

Mix, react or wet-granulate, then dry to final moisture without transferring product. Fewer transfers means less exposure, less loss and no re-segregation between steps.

VAPOUR RECOVERY

Shell-and-tube or plate condenser, receiver and cold trap sized to the evaporation duty. Solvents are recovered as liquid for reuse rather than vented.

OXYGEN-FREE PROCESSING

Evacuate and back-fill with nitrogen for oxidation-sensitive or dust-explosive products. ATEX execution and inert-loop control available.

WHERE VACUUM MIXING AND DRYING IS USED

Vacuum earns its capital wherever the product is worth more than the energy, degrades with heat, or carries a solvent that has to come back.

PHARMACEUTICAL & API

Wet granulation followed by in-vessel drying to target LOD. Solvent recovery under closed loop, containment to OEB levels, full CIP and validation documentation.

10 – 30 MBAR • JACKET 40 – 60 °C

NUTRACEUTICAL & PROTEIN POWDERS

Drying botanical extracts, probiotics and whey or plant protein isolates without denaturation or loss of viable count. Colour and aroma retained.

30 – 80 MBAR • PRODUCT ≤ 45 °C

FOOD & BEVERAGE

Flavour and seasoning bases, instant powders, fruit and vegetable powders, pet-food premixes. Cook under jacket, flash-cool under vacuum, discharge stable.

50 – 150 MBAR • COOK & CHILL

BATTERY & ENERGY MATERIALS

Cathode and anode precursor drying to single-digit ppm moisture, NMP and solvent recovery, electrode slurry pre-mix. Inert atmosphere throughout.

≤ 10 MBAR • N₂ BACK-FILL

SPECIALTY CHEMICALS

Pigments, catalysts, resins and intermediates. Reaction under vacuum with controlled heat input, then dry and cool in the same body. Hastelloy and titanium available.

10 – 100 MBAR • SOLVENT RECOVERY

PLASTICS, POLYMERS & MINERALS

Drying and degassing of resins, masterbatch and additive blends before extrusion; moisture control in technical ceramics and fine mineral powders.

50 – 200 MBAR • JACKET TO 150 °C

VACUUM RANGE

10 – 200 mbar

FINAL MOISTURE

< 0.1% w/w

EVAPORATION RATE

4 – 12 kg/m²·h

CYCLE TIME

2 – 12 h

QUANTUMX

WHERE VACUUM MIXING & DRYING IS USED



PHARMACEUTICALS
For APIs, powders, granules, solvent removal, and temperature-sensitive drying processes.



NUTRACEUTICALS
Ideal for supplements, botanical extracts, protein blends, and functional ingredient processing.



FOOD & BEVERAGE
Used for flavour, seasonings, starches, specialty powders, and gentle moisture reduction.



CHEMICALS & SPECIALTY MATERIALS
Supports vacuum drying, blending, and recovery of solvents in specialty chemical production.



ADVANCED MATERIALS
Applied in ceramics, battery materials, fine powders, and other high-value engineered products.

Available as a complete integrated system with vacuum, heating/cooling, temperature control, and vapor recovery options.



ENGINEERED FOR EXCELLENCE



TEMPERATURE CONTROL: HEATING, COOLING, VACUUM

In a powder bed, conduction is slow and the product only heats where it touches metal. A jacketed ribbon mixer solves that by constantly renewing the layer at the wall — the agitator is the heat-transfer device as much as the jacket is. Add vacuum and you gain a second, independent control: the boiling point itself.

HEATING

Steam, thermal oil or electrically heated fluid through a dimpled, half-pipe or limpet-coil jacket on trough and end plates. Hollow-shaft and hollow-ribbon execution adds interior heating surface where duty demands it.

Steam • to 150 °C
Thermal oil • to 250 °C
Electric • to 200 °C

COOLING

Chilled water or glycol through the same jacket circuit. Used to pull cooked product down to a safe packing temperature, to remove frictional heat from long mixes, and to hold exothermic reactions inside their window.

Chilled water • to 4 °C
Glycol • to -20 °C
Direct CO₂ injection • optional

VACUUM AS THERMAL CONTROL

Lowering pressure lowers the boiling point, so moisture leaves at a temperature the product can survive. It also removes the entrained air that insulates particles, which measurably improves wall-to-bed heat transfer.

10 – 200 mbar absolute
Boiling point 7 – 60 °C
Flash-cooling on release

JACKET CONSTRUCTION & CONTROL

- ASME-certified jackets rated to 6 bar (90 PSI); dimple, half-pipe or limpet coil selected by duty and fluid
- Hollow shaft and hollow ribbon options raise heat-transfer area per litre by up to 45%
- Rock-wool or aerogel insulation with stainless cladding; surface temperature held below 60 °C for operator safety
- Jacket zoning on trough, end plates and doors so the whole wetted wall is active, not just the barrel
- Product RTDs in the bed, not only in the jacket — control on product temperature
- PLC recipe control of ramp, soak, cool and vacuum set-points with batch data logging

COOK & CHILL IN ONE VESSEL

Ready meals, sauces, soups, pet food and confectionery bases are cooked to temperature under steam, held, then cooled to packing temperature on the same circuit — no transfer, no second vessel, and a documented thermal record for the lot.



RIBBON MIXER VS. VACUUM RIBBON MIXER/DRYER

The vacuum machine is the same ribbon geometry inside a pressure-rated, jacketed body with a vapour system attached. It costs more and it does more. This table is where the line falls.

ATTRIBUTE	RIBBON MIXER • PRB / PVR	VACUUM MIXER/DRYER • PRBD / PVRD
Primary duty	Blending to uniformity	Blending plus drying, degassing or reaction
Operating pressure	Atmospheric, optional light purge	10 – 200 mbar absolute
Vessel construction	Open-top trough or tank, gasketed cover	Pressure/vacuum-rated body, full-penetration welds
Jacket	Optional	Standard, ASME to 6 bar
Shaft sealing	Packed gland or air purge	Double mechanical seal, vacuum-rated
Ancillaries	Feeders, dust filter	Vacuum pump, condenser, receiver, cold trap, filter
Moisture removal	None	To below 0.1% w/w, product-dependent
Solvent recovery	Not applicable	Closed-loop condensation and reuse
Heat-sensitive product	Handled by cooling only	Dries at 30 – 50 °C product temperature
Oxidation / dust risk	Managed by inert purge	Evacuate and N ₂ back-fill; inherently oxygen-free
Cycle time	3 – 20 min	2 – 12 h including drying
Installed power, 1,000 L	11 kW	18.5 kW plus vacuum skid
Relative capital	Baseline	2.5 – 4× baseline, ancillaries included
Replaces	—	A separate mixer, tray/fluid-bed dryer and the transfer between them
Choose it when	The product arrives dry and leaves dry	Moisture, solvent, oxygen or heat sensitivity is part of the specification

ENGINEERED OPTIONS & MATERIALS

RIBBON CONFIGURATIONS

Standard double ribbon, single ribbon with rods, intermeshing double ribbon, and paddle-ribbon combination. Pitch, flight width and clearance set per product.

STUB-SHAFT AGITATOR

No flanges or bolts inside the mixing zone. Removes the contamination traps, allows front or rear drive, and cuts cleaning time in food, dairy and pharma duties.

TILTING EXECUTION

The whole chamber tilts electrically for complete discharge and open-access washdown. Suited to short-run multi-batch production and cook & chill.

CLEAN-IN-PLACE

Static or rotary spray balls, programmable rinse-wash-sanitise cycles, stainless plumbing with quick-disconnects, and sloped drainage so nothing pools.

LIQUID ADDITION

Dosing ports with spray nozzles for oils, binders and flavours; high-speed choppers to emulsify liquid into powder; steam injection for cook or sterilisation.

SHAFT SEALING

Packed gland, air-purge positive-pressure barrier, or double mechanical seal. Air purge keeps fines, vapours and abrasives out of the seal housing.

MATERIALS OF CONSTRUCTION

MATERIAL	SELECTED FOR	TYPICAL INDUSTRIES
SS 304	General-purpose, food-safe, mild chemical exposure. Economical where corrosion is not the driver but sanitary design is.	Food, agriculture, pet food
SS 316 / 316L	Superior corrosion resistance in chloride-rich and acidic service; polished to Ra ≤0.8 µm for hygienic duty.	Pharma, nutraceutical, chemical
Hastelloy	Extreme chemical resistance – strong acids, solvents and oxidisers.	Specialty chemical, battery
Hardox®	Wear and friction resistance for abrasive powders and minerals; hardfaced flight edges available.	Cement, ceramics, building materials
Titanium	Lightweight with corrosion and high-temperature resistance where stainless is insufficient.	Marine, aggressive process chemistry
Carbon steel	Budget option for non-corrosive, non-sanitary service; epoxy or rubber lining available.	Industrial powders, agriculture

HORIZONTAL RIBBON MIXERS - PRB

Dimensions in mm. Working volumes tabulated at 40% and 60% of total. kW and RPM are standard executions; jacketed, vacuum and high-viscosity duties are rated separately.

MODEL	TOTAL L	WORK. 40%	WORK. 60%	KW	RPM	L	W	H	KG
PRB-5L-CP	5	2	3	1.1	365	950	400	610	110
PRB-10L-CP	10	4	6	1.1	365	1,050	400	610	120
PRB-15L-CP	15	6	9	1.1	280	1,150	450	640	140
PRB-20L-CP	20	8	12	1.1	280	1,250	500	670	160
PRB-30	30	12	18	1.5	123	940	800	1,130	250
PRB-45	45	18	27	1.5	123	940	850	1,160	260
PRB-50	50	20	30	2.2	110	1,000	900	1,200	350
PRB-60	60	24	36	2.2	110	1,000	950	1,200	450
PRB-70	70	28	42	2.2	85	1,150	980	1,250	550
PRB-100	100	40	60	2.2	85	1,410	600	1,650	600
PRB-150	150	60	90	3	80	1,450	650	1,680	620
PRB-200	200	80	120	3	70	1,570	660	1,710	650
PRB-250	250	100	150	4	65	1,680	700	1,750	700
PRB-300	300	120	180	4	65	1,700	715	1,760	750
PRB-400	400	160	240	5.5	60	1,850	800	1,900	850
PRB-500	500	200	300	5.5	60	1,980	870	2,020	950
PRB-600	600	240	360	7.5	60	2,100	900	2,090	1,050
PRB-700	700	280	420	7.5	60	2,200	920	2,100	1,150
PRB-750	750	300	450	7.5	60	2,210	960	2,150	1,250
PRB-800	800	320	480	11	52	2,350	1,000	1,765	1,350
PRB-1000	1000	400	600	11	40	2,400	1,050	1,765	1,450
PRB-1200	1200	480	720	15	40	2,600	1,100	1,800	1,600
PRB-1500	1500	600	900	15	40	2,670	1,150	1,870	1,700
PRB-2000	2000	800	1200	15	35	2,920	1,250	1,980	2,250
PRB-2500	2500	1000	1500	18.5	35	3,200	1,350	2,100	2,600
PRB-3000	3000	1200	1800	18.5	35	3,320	1,400	2,150	2,800
PRB-4000	4000	1600	2400	22	30	3,660	1,520	2,290	3,900

Mixers can be built to a total volume of up to 30,000 L.

VERTICAL RIBBON MIXERS - PVR

Dimensions in mm. Working volumes tabulated at 30% and 70% of total. Height excludes the discharge valve and support stand.

MODEL	TOTAL L	WORK. 30%	WORK. 70%	KW	RPM	DIA.	H	KG
PVR-15	15	4	10	0.75	108	450	1600	150
PVR-20	20	6	14	0.75	90	550	1800	200
PVR-30	30	9	21	1.1	90	550	1800	280
PVR-45	45	14	32	1.1	80	655	1900	350
PVR-50	50	15	35	1.1	80	655	1900	400
PVR-60	60	18	42	1.1	78	720	1900	450
PVR-70	70	21	49	1.5	77	720	1900	550
PVR-100	100	30	70	1.5	69	720	1900	600
PVR-150	150	45	105	2.2	62	875	2200	700
PVR-200	200	60	140	2.2	57	875	2200	800
PVR-250	250	75	175	3	53	980	1900	420
PVR-300	300	90	210	3	51	980	1900	450
PVR-400	400	120	280	4	44	1160	2100	500
PVR-500	500	150	350	4	43	1160	2100	550
PVR-600	600	180	420	4	40	1500	2300	700
PVR-700	700	210	490	5.5	39	1500	2300	820
PVR-750	750	225	525	5.5	39	1500	2300	950
PVR-800	800	240	560	5.5	35	1500	2300	1100
PVR-1000	1000	300	700	7.5	33	1525	2600	1350
PVR-1200	1200	360	840	7.5	31	1680	2800	1600
PVR-1500	1500	450	1050	11	29	1680	2800	1800
PVR-2000	2000	600	1400	15	29	1860	3100	2000

Mixers can be built to a total volume of up to 30,000 L.

HORIZONTAL VACUUM RIBBON MIXERS/DRYERS - PRBD

Dimensions in mm and exclude the vacuum pump, condenser and receiver skid. kW and RPM shown are for jacketed vacuum execution and vary with product viscosity and drying duty.

MODEL	TOTAL L	WORK. 40%	WORK. 60%	KW	RPM	L	W	H	KG
PRBD-5L-CP	5	2	3	1.1	256	950	900	610	140
PRBD-10L-CP	10	4	6	1.1	256	1,050	900	610	160
PRBD-15L-CP	15	6	9	2.2	196	1,150	1,000	640	180
PRBD-20L-CP	20	8	12	2.2	196	1,250	1,050	670	210
PRBD-30	30	12	18	3	86	940	950	1,130	330
PRBD-45	45	18	27	3	86	940	1,000	1,160	340
PRBD-50	50	20	30	4	77	1,000	1,050	1,200	460
PRBD-60	60	24	36	4	77	1,000	1,100	1,200	590
PRBD-70	70	28	42	4	60	1,150	1,130	1,250	720
PRBD-100	100	40	60	4	60	1,410	750	1,650	780
PRBD-150	150	60	90	5.5	56	1,450	800	1,680	810
PRBD-200	200	80	120	5.5	49	1,590	810	1,710	850
PRBD-250	250	100	150	7.5	46	1,750	850	1,750	910
PRBD-300	300	120	180	7.5	46	1,825	865	1,760	980
PRBD-400	400	160	240	11	42	1,900	950	1,900	1,110
PRBD-500	500	200	300	11	42	2,010	1,020	2,020	1,240
PRBD-600	600	240	360	15	42	2,200	1,050	2,090	1,370
PRBD-700	700	280	420	15	42	2,300	1,070	2,100	1,500
PRBD-750	750	300	450	15	42	2,355	1,110	2,150	1,630
PRBD-800	800	320	480	18.5	36	2,400	1,150	1,765	1,760
PRBD-1000	1000	400	600	18.5	28	2,500	1,200	1,765	1,890
PRBD-1200	1200	480	720	22	28	2,650	1,250	1,800	2,080
PRBD-1500	1500	600	900	22	28	2,850	1,300	1,870	2,210
PRBD-2000	2000	800	1200	22	25	3,020	1,400	1,980	2,930
PRBD-2500	2500	1000	1500	30	25	3,200	1,500	2,100	3,380
PRBD-3000	3000	1200	1800	30	25	3,400	1,550	2,150	3,640

Mixers can be built to a total volume of up to 30,000 L.

VERTICAL VACUUM RIBBON MIXERS/DRYERS - PVRD

Dimensions in mm and exclude the vacuum skid. Working volumes at 30% and 70% of total.

MODEL	TOTAL L	WORK. 30%	WORK. 70%	KW	RPM	DIA.	H	KG
PVRD-15	15	4	10	1.5	92	450	1800	180
PVRD-20	20	6	14	1.5	77	550	2100	240
PVRD-30	30	9	21	2.2	77	550	2100	340
PVRD-45	45	14	32	2.2	68	655	2200	420
PVRD-50	50	15	35	2.2	68	655	2200	480
PVRD-60	60	18	42	2.2	66	720	2200	540
PVRD-70	70	21	49	3	65	720	2200	660
PVRD-100	100	30	70	3	59	720	2200	720
PVRD-150	150	45	105	4	53	875	2500	840
PVRD-200	200	60	140	4	48	875	2500	960
PVRD-250	250	75	175	5.5	45	980	2200	550
PVRD-300	300	90	210	5.5	43	980	2200	590
PVRD-400	400	120	280	7.5	37	1160	2400	650
PVRD-500	500	150	350	7.5	37	1160	2400	720
PVRD-600	600	180	420	7.5	34	1500	2600	910
PVRD-700	700	210	490	11	33	1500	2600	1070
PVRD-750	750	225	525	11	33	1500	2600	1240
PVRD-800	800	240	560	11	30	1500	2600	1370
PVRD-1000	1000	300	700	15	28	1525	3000	1430
PVRD-1200	1200	360	840	15	26	1680	3200	1560
PVRD-1500	1500	450	1050	18.5	25	1680	3200	1690
PVRD-2000	2000	600	1400	22	25	1860	3600	1890
PVRD-2500	2500	750	1750	22	20	2000	3700	1950
PVRD-3000	3000	900	2100	30	20	2080	3900	2080
PVRD-4000	4000	1200	2800	37	20	2300	4100	3320

Mixers can be built to a total volume of up to 30,000 L.

TWELVE QUESTIONS FOR EVERY BIDDER

Ribbon mixer quotations are hard to compare because most of them describe the same three numbers. Put these twelve questions to every supplier on your list, side by side, and the differences become visible immediately. Our answers are printed here so you can hold us to them.

#	ASK EVERY SUPPLIER	THE QUANTUMX ANSWER
01	What is the flight width, as a fraction of agitator diameter?	Stated on the quotation, selected against your material – page 05.
02	What are the inner and outer pitches, and are the two mass flows balanced?	Both stated. Balanced by calculation, not by convention.
03	What is the radial clearance to the trough wall, and how is it verified?	3 – 8 mm by size and particle; recorded at FAT.
04	What tip speed does the quoted RPM actually produce?	Calculated and printed in m/s, not left as RPM.
05	What CV will the machine reach on my material, and in how many minutes?	Measured in trial before quotation, written into the order.
06	How was that CV sampled – how many points, by what method?	Thief probe, 10 points per interval, full curve supplied.
07	At what fill ratio was that result obtained, and what is the valid window?	Stated at both bounds – 40/70% horizontal, 30/70% vertical.
08	What Froude number does the scale-up hold from pilot to production?	Fr held constant below 1.0; the basis is disclosed.
09	How much heat-transfer area per litre, and is it jacket only or shaft and ribbon too?	Quantified; hollow shaft and ribbon add up to 45% – page 14.
10	Is the control loop on jacket temperature or on product temperature?	Product RTDs in the bed; control on the product.
11	What residual heel remains in the vessel after discharge?	Measured at FAT, not asserted in the datasheet.
12	Will the production machine be tested against the same criteria as the trial?	Yes. Same tracer method, same acceptance criteria, before shipment.

WHY WE PUBLISH THIS

A supplier who will commit to these twelve in writing is quoting a process outcome. A supplier who will only quote volume, motor and RPM is quoting a steel fabrication. Both arrive on a truck; only one of them is guaranteed to make your product.

NEXT STEP

SEND US YOUR PRODUCT, NOT JUST YOUR VOLUME

Give us the material, the target CV, the batch size and the cycle time you need. We will run it, define the ribbon geometry, and quote a machine with the numbers written into the order.

Trial

Pilot machine, your material, CV curve measured.

Specify

Geometry, materials, thermal and vacuum scope fixed.

FAT

Tested against the same acceptance criteria before shipment.



QuantumX

— THE NEXT GENERATION OF MIXING —

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Edition

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