Dryer Fabric Installation Guide

Complete installation manual for flat yarn, round yarn, and spiral dryer fabrics
Seam types · tension profiles · guiding systems · post-installation inspection

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1. Safety Precautions

WARNING: Dryer section installation presents unique hazards beyond general paper machine safety — high-temperature surfaces (cylinders can retain dangerous heat for hours after shutdown), pressurized steam systems, confined spaces between dryer cylinders and felts, and heavier fabric rolls than wet-end fabrics. All personnel must wear heat-resistant gloves (rated ≥180 °C), safety helmet, steel-toe boots, and safety glasses. Full LOTO on drive, steam, and condensate systems is mandatory.

- Verify cylinder surface temperature is below 40 °C at all personnel contact points before anyone enters the dryer section. Use an IR thermometer — do NOT rely on touch or "feel" tests.
- Steam system isolation: double-block-and-bleed arrangement must be confirmed by the authorized steam plant operator.
- A minimum of 4 trained personnel is required; 6 for machines wider than 5 meters due to heavier fabric weights.
- Confined space protocol: personnel inside dryer frames must use the buddy system with check-in every 10 minutes. The dryer section has multiple confined zones between cylinders.
- Crane capacity must be verified for the fabric roll weight (see packing slip) with ≥50% safety margin. Dryer fabric rolls are heavier than forming fabrics of equivalent width.

2. Dryer Section Preparation & Cleaning

The dryer section environment is harsher than the wet end — accumulated fiber dust, sizing/starch deposits from the size press, coating carry-back, and rust scale must be thoroughly removed before a new fabric enters. Contamination is the leading cause of premature dryer fabric replacement — a contaminated fabric can lose 30–50% of its permeability within the first month of operation.

- Dry-clean all cylinder surfaces with a rotating brush or industrial vacuum system. Pay special attention to cylinder edges where deposits preferentially accumulate.
- Clean all guide rolls, felt rolls, and stretch rolls. Verify every roll rotates freely with zero bearing play.
- Inspect and clean all vacuum/blow boxes. Remove any fiber accumulation from box edges — this is a common cause of fabric edge wear.
- Clean or replace all doctor blades. A worn doctor blade causes uneven coating build-up that transfers to the fabric surface, creating localized impermeability zones.
- Inspect rope systems (if present) for wear, splice integrity, and proper tension. Rope failure during fabric installation creates a serious safety hazard.
- Using an optical alignment system, verify all dryer cylinders and guide rolls are parallel within ±0.3 mm/meter of face length.
- Pay special attention to the guide roll — it must be level and parallel within ±0.2 mm/m. Guide roll misalignment is the most common cause of chronic tracking problems.

3. Fabric Handling Guidelines

Dryer fabrics are typically heavier per unit area than forming fabrics and more susceptible to crease damage if mishandled. The larger roll diameters require careful crane coordination. Unlike forming fabrics, dryer fabrics have a defined sheet side and machine side — installing the fabric inside-out will cause immediate sheet quality problems.

- Never fold the fabric. Use a spreader bar with slings at the 1/4 and 3/4 width positions for balanced, controlled lifting.
- When rolling fabric across the floor, protect the entire path with clean plastic sheeting or cardboard.
- Never walk on the fabric. Use clean plywood bridges if crossing is necessary. Footprints are permanent contamination sources.
- Acclimatize the fabric in the machine hall for 24 hours before installation. This is especially important for dryer fabrics due to thermal expansion effects.
- Check the fabric ID tag: model, dimensions, seam type, and running direction must all match the machine order exactly.
- For spiral fabrics: verify the pintle connection kit is complete — pintle wires, lubricant, and insertion tools must all be present before starting.

4. Installation Procedure

Dryer fabric installation follows the same basic pull-in procedure as forming fabrics, with additional complexity from the serpentine path through multiple dryer tiers. Take time to mark the fabric path clearly for all personnel.

- Define the Fabric Route: Study the machine drawing or sketch the fabric path on a whiteboard. Identify every roll the fabric contacts — top and bottom cylinders, guide rolls, stretch roll, felt rolls, and any blow/vacuum boxes.
- Pull the Fabric: Attach the pulling rope to the fabric lead edge. Route following the defined path, ensuring the rope pulls the fabric onto (not under) each cylinder and roll. Pull at 2–4 m/min, reducing to 1 m/min through tight clearances.
- Station one person per dryer tier to monitor fabric passage and immediately report any contact issues.
- Seam the Fabric: When both fabric ends meet at the designated seam position (typically at the stretch roll), join per Section 5 below.
- Initial Tension: Apply as per the tension table in Section 6. Jog the machine at minimum speed for 10 minutes, observing tracking on all rolls before proceeding.

5. Seam Joining Methods

Seam Type	Procedure	Time (2-person)	Critical Verification

Seam Type	Procedure	Time (2-person)	Critical Verification
Pin Seam	Align seam loops; insert pintle wire using insertion tool; apply lubricant; bend/secure wire ends	20–40 min	Every loop engaged — verify with 0.05 mm feeler gauge along entire seam
Spiral Seam	Inter-mesh the spiral coil ends; insert pintle through the intermeshed channel; lubricate; secure pintle ends	15–25 min	Coils fully intermeshed — partial mesh causes rapid localized failure
Woven-In Seam	Factory-joined endless fabric — no on-machine seam required	N/A	Requires cantilever or removable roll for installation; verify fabric is not twisted

6. Tension Profiles by Fabric Type

Fabric Type	Initial (kN/m)	Run-In (kN/m)	Operating (kN/m)	Maximum (kN/m)
Flat Yarn — FY-2800	1.5	2.0	2.5–3.5	4.0
Flat Yarn — FY-2000	2.0	2.5	3.0–4.0	4.5
Round Yarn — RY-3000	1.5	2.0	2.0–3.0	3.5
Spiral — SP-4000	2.0	3.0	3.5–5.0	5.5
Spiral — SP-3400	2.5	3.5	4.0–5.5	6.0

7. Guiding System Setup

- Paddle guide: Use for machines operating below 600 mpm. Set paddle pressure to 0.15–0.30 bar. Inspect paddle contact surface weekly for wear.
- Optical sensor: Required for machines above 600 mpm. Position sensor approximately 50 mm from the nominal fabric edge. Clean sensor lens daily — dust accumulation is the leading cause of guide failures.
- Guide roll must have a minimum ±35 mm stroke from the neutral position to accommodate the full range of fabric wander.
- Guide response: A 10 mm edge deviation should correct within 5 seconds on dryer fabrics (slightly slower than wet-end fabrics is acceptable due to the longer, heavier fabric path).
- On single-tier machines, verify the fabric is guided on the return run (not the sheet-carrying run). Guiding on the sheet-carrying run can cause sheet wrinkling as the guide correction propagates through the fabric.

8. Post-Installation Inspection

Item	Method	Target	Result
Seam integrity	Visual + 0.05 mm feeler gauge	All loops engaged across full width	☐
Tracking at crawl (15 mpm)	Observe 10 minutes	Edge position stable within ±8 mm	☐
Tracking at run-in speed	Observe 20 minutes	Edge position stable within ±8 mm	☐
Fabric tension at 3 positions	Tension meter	As per tension table ±0.3 kN/m	☐
Clearance to stationary parts	Visual inspection	≥10 mm clearance at all points	☐
Steam/condensate system	Operator verification	Per SOP; no leaks affecting fabric	☐