

SHIVPRIYA TEXCHEM · KNOWLEDGE SERIES

Vortex (MVS). Air instead of a spindle.

Vortex spinning has no rotor, no traveller and no spindle. A jet of swirling air does the work, and it does it fifteen to twenty times faster than a ring frame. The yarn it produces behaves like nothing else on the market.

450 m/min

delivery speed — roughly twenty times a ring spindle

Near zero

protruding hairs; the wrapping mechanism leaves no free ends

4–5

typical pilling grade, the best of any staple spinning system

Bridging world-class spinning mills and your needs, since 2003.

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CHAPTER 01

How air makes a yarn

Murata Vortex Spinning takes drafted sliver directly into an air nozzle. There is no mechanical twisting element at all — the yarn is formed by air pressure acting on the trailing ends of fibres, and by nothing else.



Sliver to finished cone in one machine — no roving, no winding, no twisting element

01 Four-line drafting

A conventional apron drafting system attenuates the sliver to final count and feeds it forward.

03 The ends fly open

Compressed air blows the trailing ends of the fibres outward, away from the bundle core.

05 A wrapped structure

The result is a straight untwisted core sheathed in tightly wrapped surface fibres.

02 Into the nozzle

The fibre bundle enters an air jet aimed at the tip of a stationary hollow spindle.

04 The vortex wraps them

A swirling air current whips those open ends around the core as it is drawn into the spindle.

06 Straight to cone

The yarn is wound directly onto a package. There is no separate winding stage.

Not twist — wrapping. This is the single most important thing to understand about vortex yarn. It has **almost no real twist**. Its strength comes from surface fibres binding a parallel core, which is why it behaves so differently from every twisted yarn you know.

CHAPTER 02

A core and a sheath, not a helix

Ring, rotor and air-jet yarns are all variations on twisting fibres together. Vortex yarn is structurally a different object — a two-zone yarn with an untwisted interior and a highly ordered exterior.

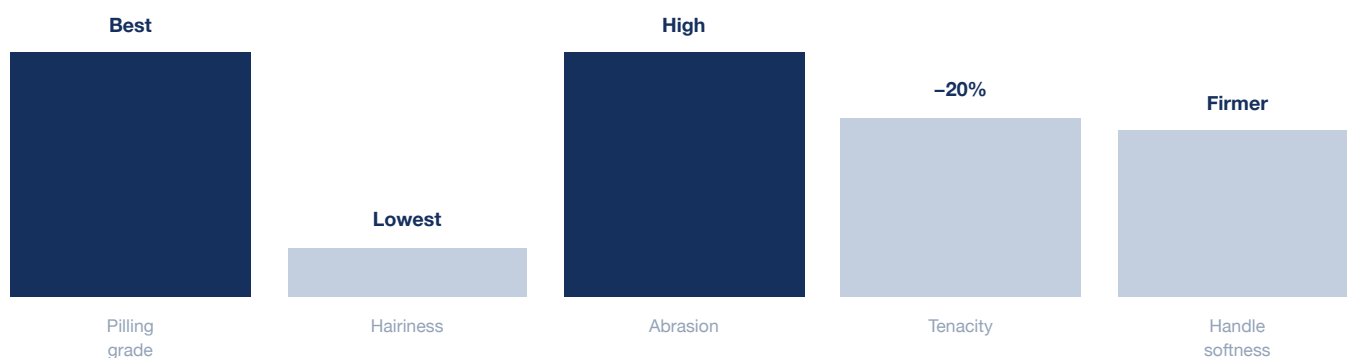
ZONE	WHAT IS THERE	WHAT IT CONTRIBUTES
Core	Parallel, essentially untwisted fibres	Bulk, softness, moisture transport and the yarn body
Sheath	Tightly wrapped surface fibres	All of the strength, the abrasion resistance and the smoothness
Surface	No protruding free ends	Almost no hairiness, and therefore very high pilling resistance

RING YARN	ROTOR YARN	VORTEX YARN
True helix	Core + wrappers	Core + sheath
Even twist	Disordered zone	No real twist
Hairy surface	Bulky	Smooth surface
Strength from twist	Strength from twist	Strength from wrapping

CHAPTER 03

The pilling result that sells the system

Vortex yarn loses on tenacity and wins decisively on surface behaviour. For a great many end uses that is exactly the right trade, and it is the reason the system found its market.



Vortex yarn against a comparable ring yarn of the same count and blend

PROPERTY	DIRECTION	THE STRUCTURAL REASON
Pilling resistance	Much better	Pills form from surface hairs. There are almost none to start from.
Hairiness	Much lower	Fibre ends are wrapped into the sheath rather than left protruding.
Abrasion resistance	Better	A tightly bound surface presents very little loose material to wear away.
Moisture transport	Better	The untwisted core wicks readily along parallel fibre channels.
Tenacity	Lower	The core carries little load; only the sheath is truly binding the yarn.
Handle	Firmer, crisper	Often described as dry or lean. Some markets prefer it; some clearly do not.

CHAPTER 04

What vortex spinning likes and dislikes

Vortex is the most fibre-sensitive of the mainstream systems. The wrapping mechanism depends on trailing ends behaving predictably in the air stream, and not every fibre does.

FIBRE	SUITABILITY	WHY
Viscose	Excellent	Smooth, uniform, consistent length — the fibre vortex spinning was effectively made for
Modal & lyocell	Excellent	Same behaviour as viscose with higher strength; a natural premium application
Polyester	Very good	Uniform synthetic staple wraps predictably; PV blends run particularly well
PC blends	Good	Widely run commercially, with more attention needed to preparation
Combed cotton	Workable	Possible but demanding; short fibre content directly hurts the sheath
Carded cotton	Poor	Short fibre and trash disrupt wrapping. Generally not commercially sensible

Why viscose dominates. Man-made staple has controlled length, no trash and no short-fibre tail. Vortex spinning rewards all three heavily. This is why the vortex market in India is overwhelmingly **viscose, modal and PV** rather than cotton.

CHAPTER 05

Where vortex yarn belongs

Vortex found its market in fabrics where surface durability outranks tensile strength, and where the fabric is washed often and judged on how it looks after twenty washes rather than on day one.

END USE	WHY VORTEX FITS
Viscose shirting	Drape of viscose with a pilling grade viscose normally cannot deliver — the flagship application
Uniform & workwear	Fabrics washed constantly and judged on appearance retention over months of service
Hospital & hotel linen	Industrial laundering destroys hairy yarns. A wrapped surface survives it far better
Activewear blends	Moisture transport through the parallel core, with a smooth non-irritating surface
Fashion knits in MMF	Clean surface holds print and colour sharply; no fuzz developing after wear
Bottom-weight MMF	Abrasion resistance where a soft, hairy yarn would surface-fibrillate quickly

- **Poor fit:** fabrics sold on a soft, lofty, brushed handle — vortex reads as lean and dry.
- **Poor fit:** high-tenacity warp applications where the 20% strength gap cannot be designed around.
- **Poor fit:** carded cotton at any count, where the economics and the quality both fail.

CHAPTER 06

Speed is the whole business case

One vortex machine replaces a very large number of ring spindles. That is the argument. Everything else — the quality profile, the fibre limits — decides whether you can use it.

01 Delivery speed

Around 450 m/min against roughly 20–25 m/min at a ring spindle. The ratio is the business case.

02 Departments removed

No speed frame and no winding. Sliver goes in, a finished cone comes out.

03 Labour per kilo

Very low. Automatic piecing and doffing are standard rather than optional.

04 Compressed air

The major running cost, and it is continuous. Air system efficiency directly sets conversion cost.

05 Capital cost

High per machine, but very low per kilo of annual capacity at the counts it suits.

06 Yarn realisation

Commands a premium in the right end uses, and no premium at all in the wrong ones.

The real constraint. Vortex economics are excellent — **inside a narrow window**. Man-made fibre, medium to fine counts, end uses that value surface durability. Outside that window the machine is simply the wrong tool, whatever the speed figure says.

CHAPTER 07

What the spinner actually controls

There is no twist to adjust and no traveller to change. The vortex spinner works with air, geometry and speed — a much smaller set of levers than a ring spinner has, each with a larger effect.

Nozzle pressure

Sets how aggressively trailing ends open and wrap. The primary quality lever on the machine.

Spindle geometry

Hollow spindle diameter and tip shape govern sheath tightness and yarn firmness.

Delivery speed

Faster delivery means less wrapping time per unit length — speed and strength trade directly.

Draft distribution

Fibre presentation into the nozzle decides how cleanly the wrapping mechanism works.

SYMPTOM

USUALLY MEANS

Weak yarn, low tenacity

Insufficient wrapping — nozzle pressure or delivery speed out of balance

Harsh, wiry handle

Over-wrapped sheath; the yarn has been bound too tightly

Fluctuating strength

Air pressure instability, or a partially blocked nozzle on that position

Rising hairiness

Worn nozzle or spindle tip — the geometry has drifted out of specification

Frequent breaks

Short fibre content too high for the sheath to form reliably

CHAPTER 08

Vortex against air-jet and rotor

Vortex is often lumped together with air-jet spinning because both use compressed air. They are different mechanisms producing different yarns, and confusing them leads to buying the wrong one.

	VORTEX	AIR-JET	ROTOR
Mechanism	Vortex wraps open ends	Twin jets false-twist	Fibres reassembled in a rotor
Twist	Essentially none	Wrapped, no net twist	True twist
Best fibre	Viscose, MMF	Polyester, PC	Cotton, coarse
Signature	Pilling resistance	Smoothness at speed	Bulk and absorbency
Counts	Medium to fine	Medium to fine	Coarse to medium

Air-jet made a smooth yarn quickly. Vortex made a yarn that **does not pill** — and that turned out to be the more valuable problem to solve.

CHAPTER 09

Buying and testing vortex yarn

Vortex yarn cannot be evaluated with the reflexes you use for ring yarn. Several of the numbers you would normally check mean something different here.

01 Do not judge on tenacity alone

It will read 15–25% below ring. That is the structure, not a defect. Judge it against the fabric requirement.

03 Check hairiness consistency

Rising hairiness across a lot usually means nozzle or spindle wear, and it will keep getting worse.

05 Test the handle early

The dry, crisp handle is the most common reason a vortex trial is rejected. Find out before bulk.

02 Ask for the pilling grade

This is the number vortex is bought for. Insist on a tested grade on the actual fabric.

04 Confirm the fibre

Vortex on viscose and vortex on carded cotton are not comparable products at all.

06 Run a wash trial

Vortex fabric often looks ordinary new and clearly better after twenty washes. Test what your customer will see.

How Shivpriya reads it. We position vortex where **appearance after washing** is the commercial argument — uniforms, institutional linen, viscose shirting. Where the buyer is judging a soft handle on the counter, we will usually point you back to ring.

IN CLOSING

No spindle. No traveller. No pills either.

Vortex spinning solved a problem the industry had lived with for a century — the pilling of soft man-made staple — and it did so at twenty times ring speed. It is not a universal yarn, and it is not meant to be. If you are evaluating vortex for a shirting, a uniform or an institutional programme, talk to us and we will show you where it holds up.

TALK TO US

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