Worsted spinning technologies

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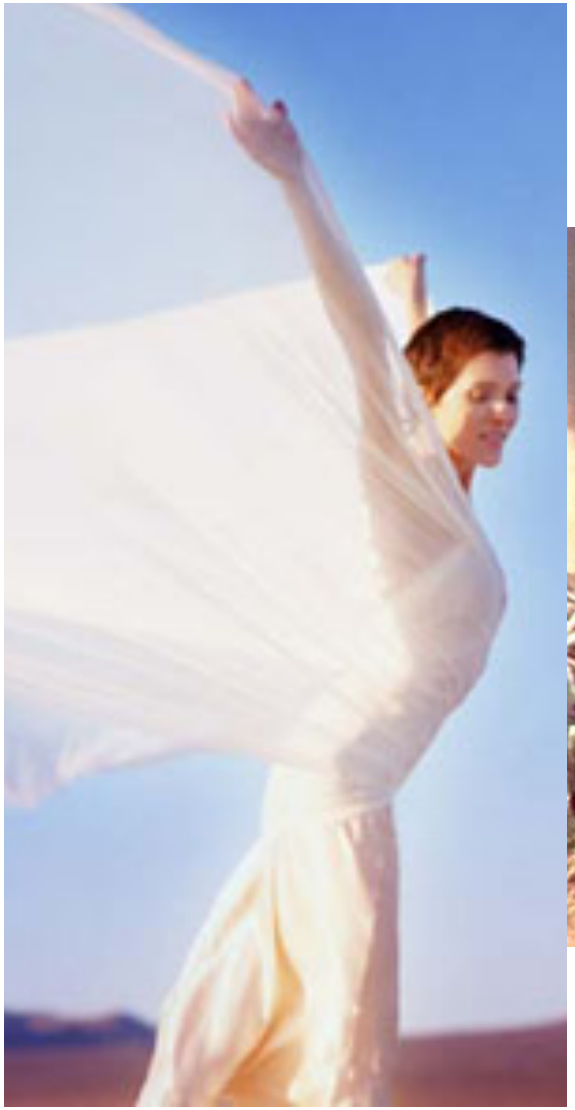


New/different product needs

1. Innovative thinking to develop new concepts
2. New/different processes to generate different products
3. Adoption
4. Either approach individual aspects of production chain or combinations of factors in chain

New/different products created by:

- Fibre
- Blends
- Physical and chemical modification
- Yarn formation differences
- Adoption of non-conventional methods
- Versatility in finishing
- Fabric geometry and design

Fibre crimp

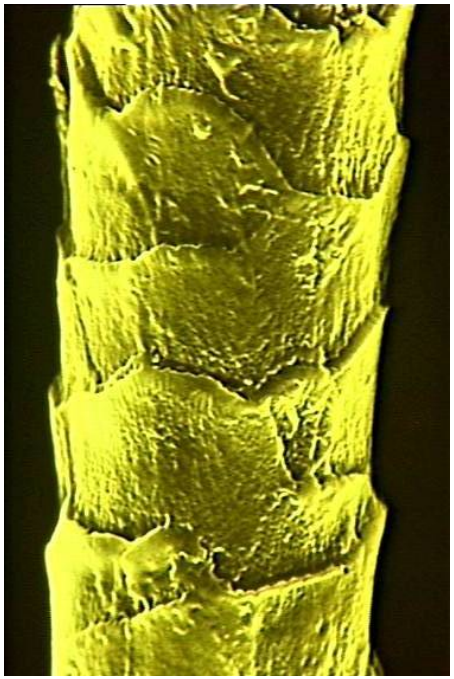
Effects of fibre crimp:

- shrinkage
- fabric weight
- pilling
- thickness
- air permeability

Fibre length

Effects of longer fibre length:

- reduced breaks in spinning
- improved yarn properties
- pilling



Changes in yarn formation – what they mean for wool products

- Reference is ring spun
- Potential new products for wool
- Fabric appearance critical
- Conservative industry, Western Europe

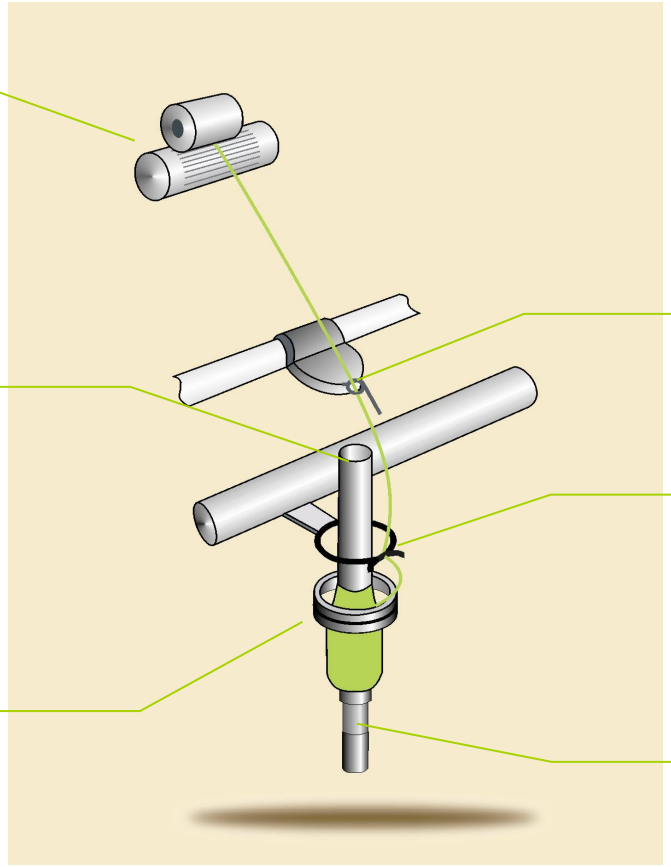
Yarn requirements

- Constant mass
- cm to cm / km to km
- Robust
- Minimum weak places
- Good appearance
- Function
- Appeal

Processes:

- Combing
- Drawing
- Spinning
- Wind/clear faults
- Twisting
- Fabrication

Spinning


Front drafting roller
Bobbin
Ring/Traveller
Yarn guide
Balloon control ring
Spindle

Limits: spinning production (m/min)

Spindle speed (rpm)	10,000	30,000
Wool (700 TPM)	14.3	na
Cotton (840 TPM)	11.6	35.4

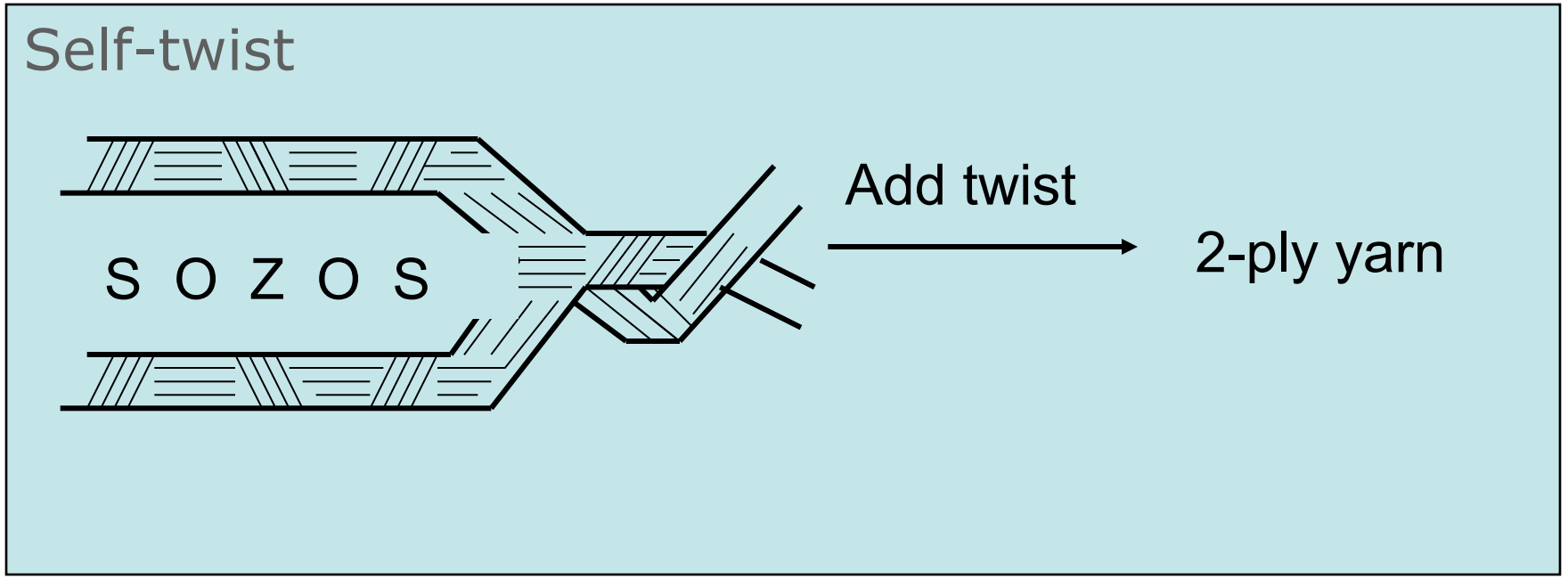
Limits: fibre diameter

	Wool		Cotton
Fibre Diameter (Micron)	18	22	12
Yarn count, Nm (@ 40 fibres)	78	52	114
Min. fabric weight (g/m^2)			
-plain weave	160	205	75
-gaberdine	190	240	90

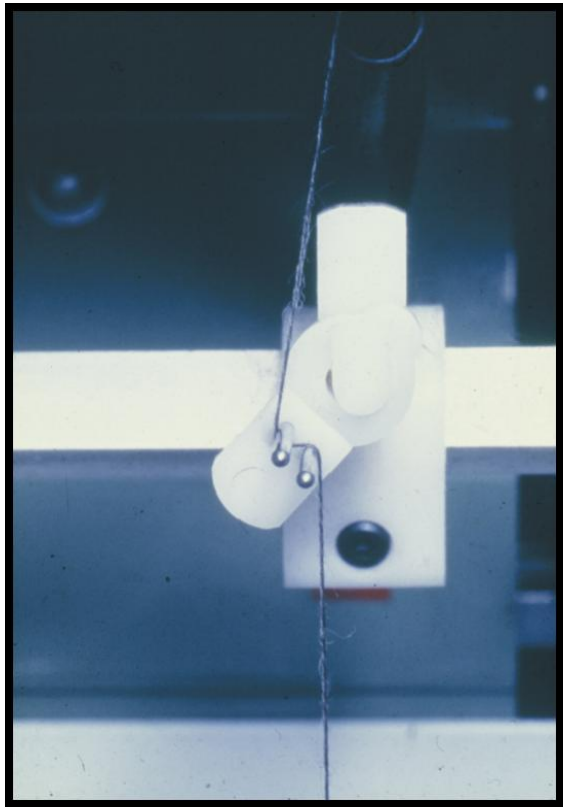
Costing

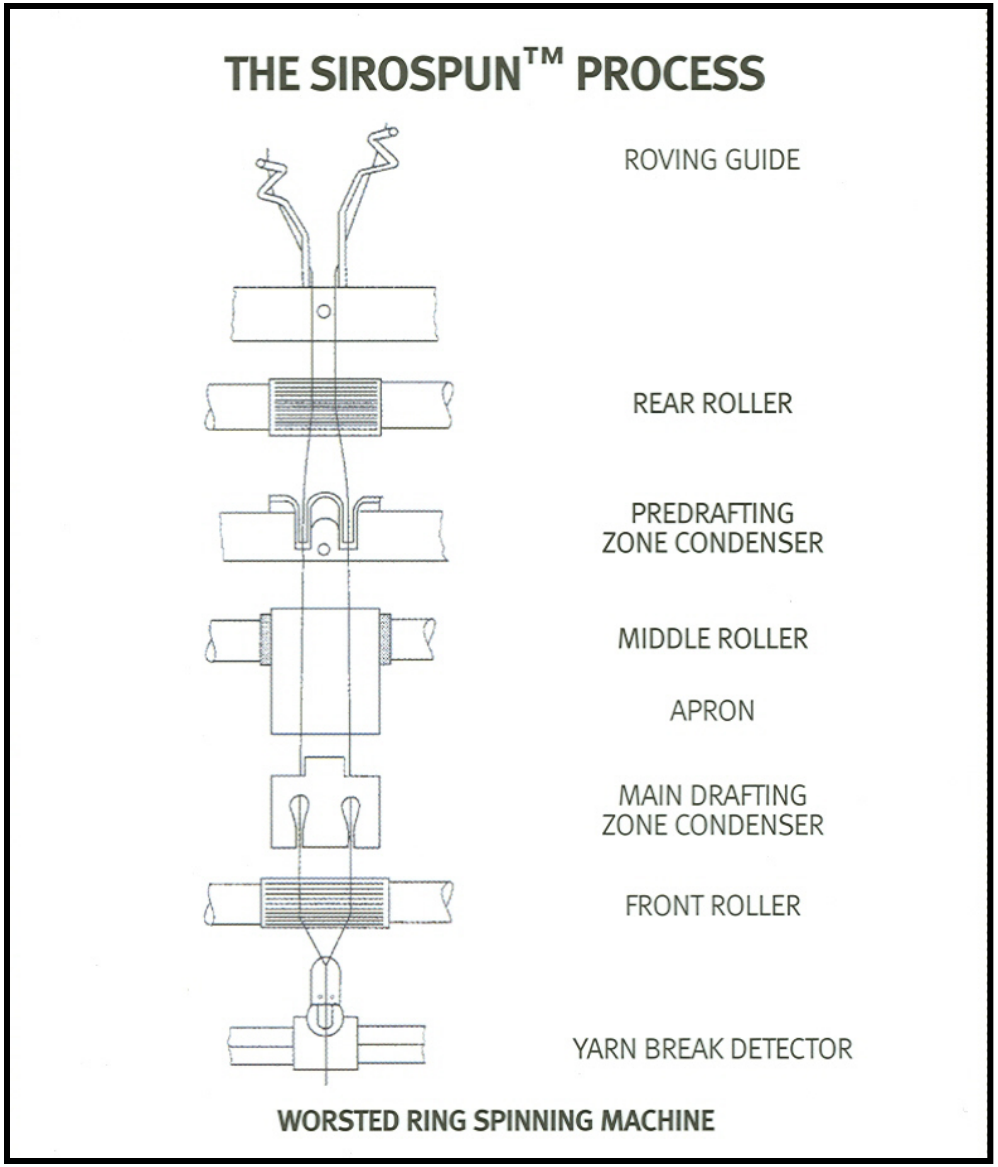
Yarn count and fibre diameter	Yarn price AUD $/Kg	Est. conversion cost AUD$/kg	Comments
1/24 Nm 22 micron	17.00	6.00	
1/56 Nm 18.5 micron	23.50	11.5	Compares with combed cotton ring spun conversion cost of $3.50/kg i.e. ratios of 3.2 to 4.3
1/72 Nm 18.5 micron	27.70	16.70	

Self-twist

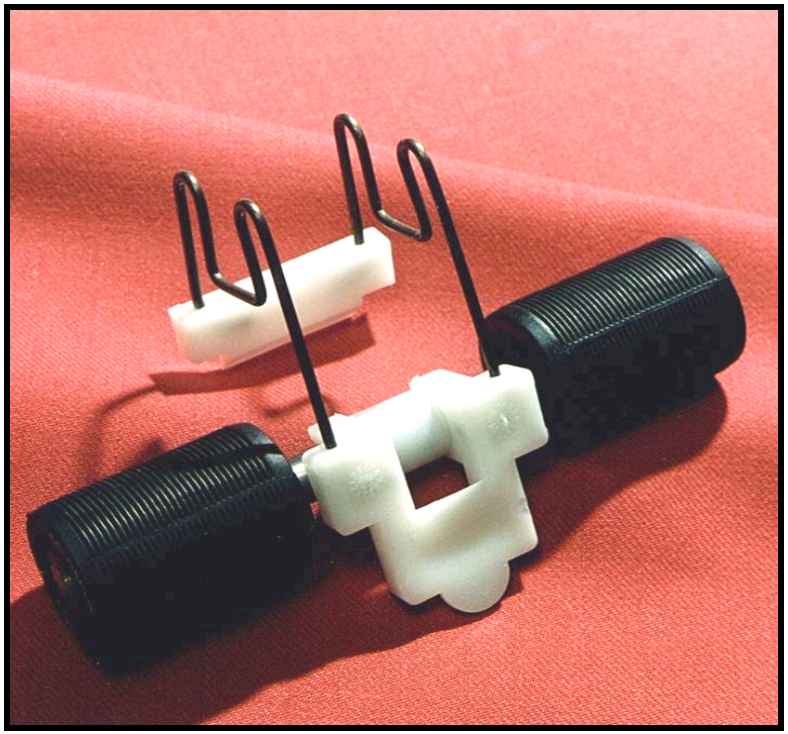


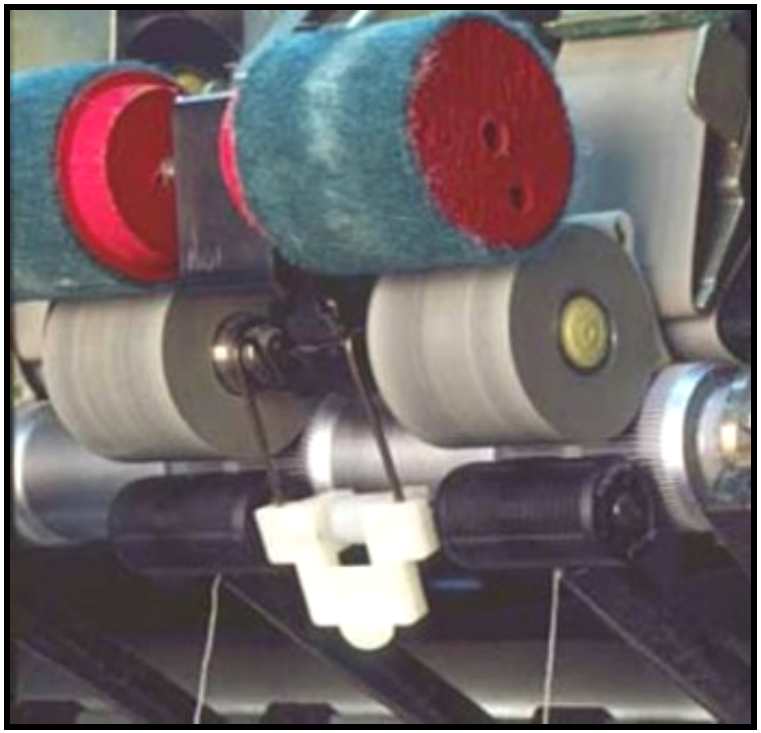
Sirospun



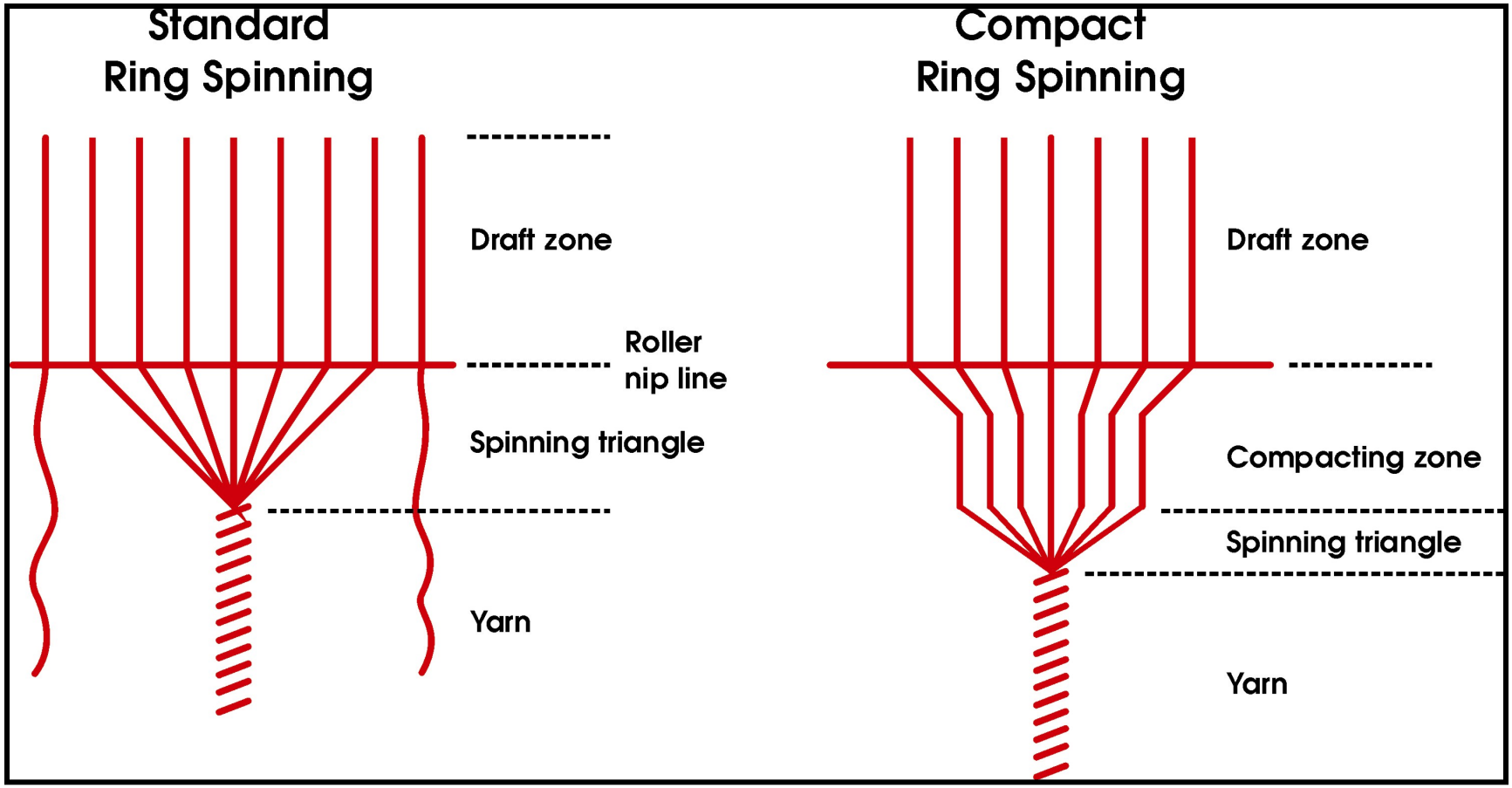

THE SIROSPUN™ PROCESS
ROVING GUIDE
REAR ROLLER
PREDRAFTING ZONE CONDENSER
MIDDLE ROLLER
APRON
MAIN DRAFTING ZONE CONDENSER
FRONT ROLLER
YARN BREAK DETECTOR
WORSTED RING SPINNING MACHINE

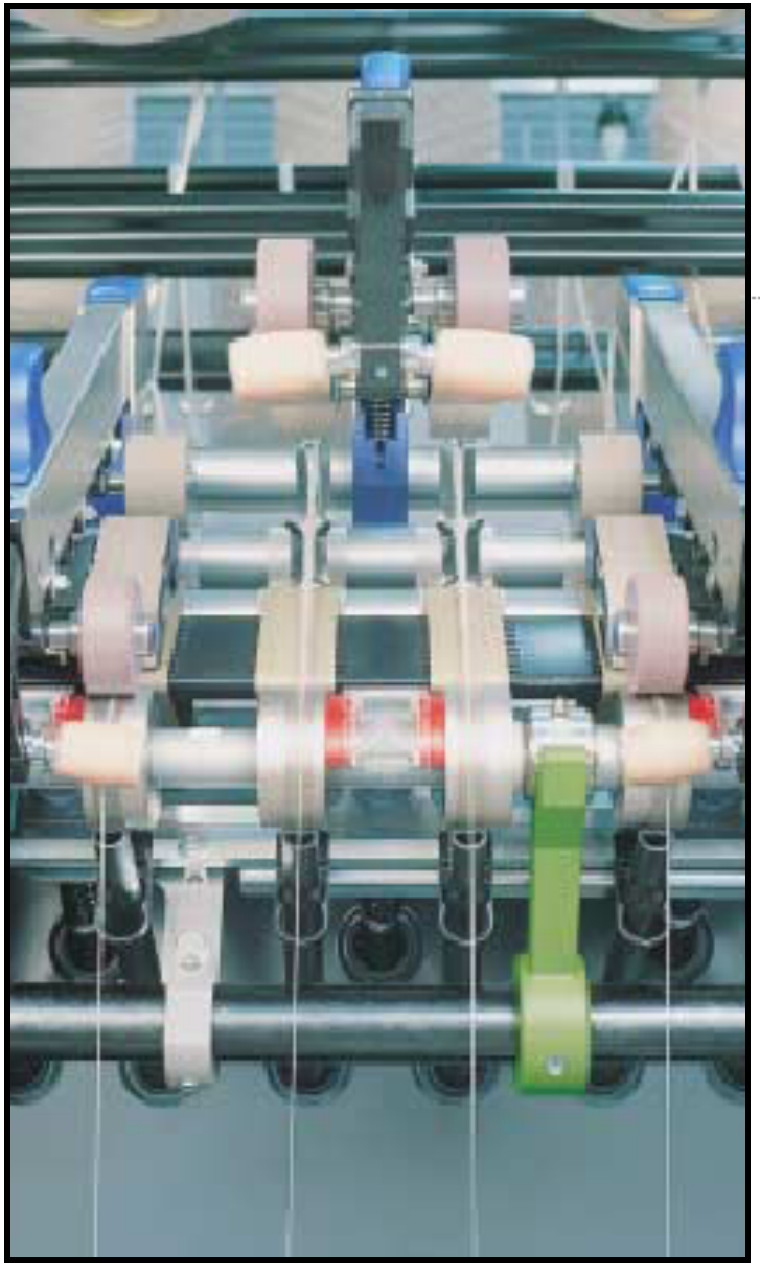
Solospun





Air-condensed or compact spinning

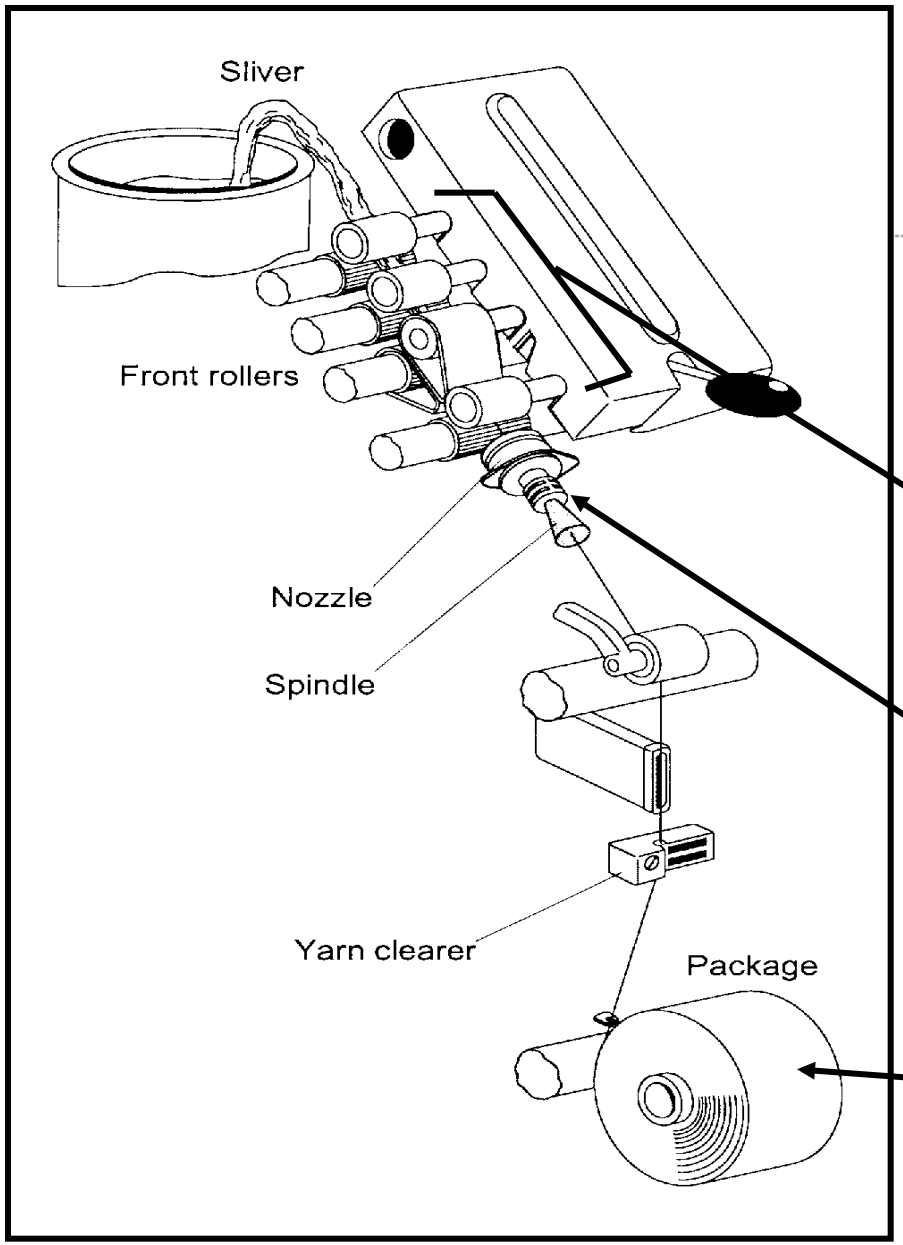




Compact spinning system

Courtesy Cognetex SpA – COM4 WOOL

Murata Vortex spinning system

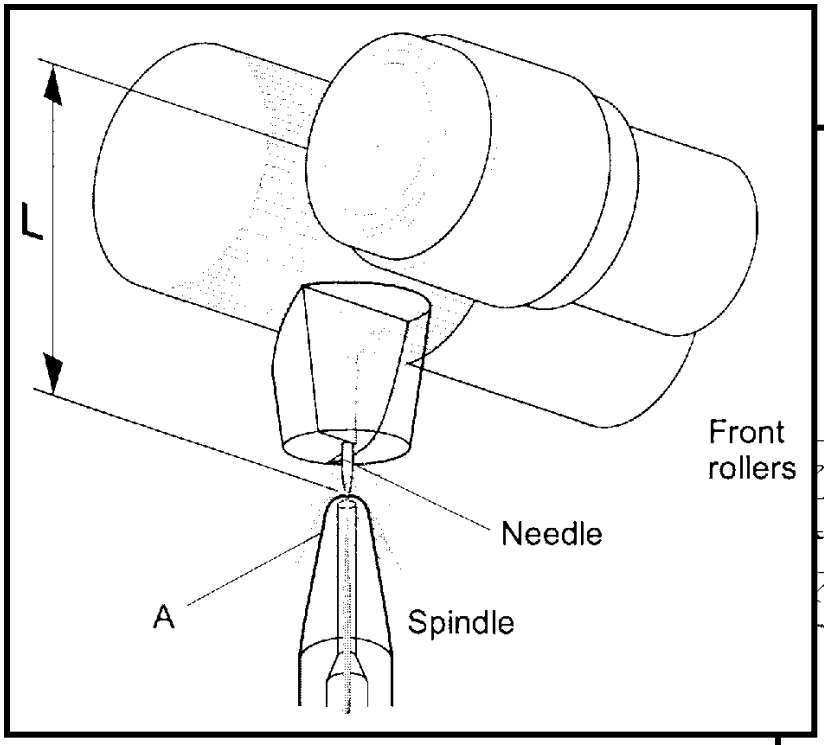


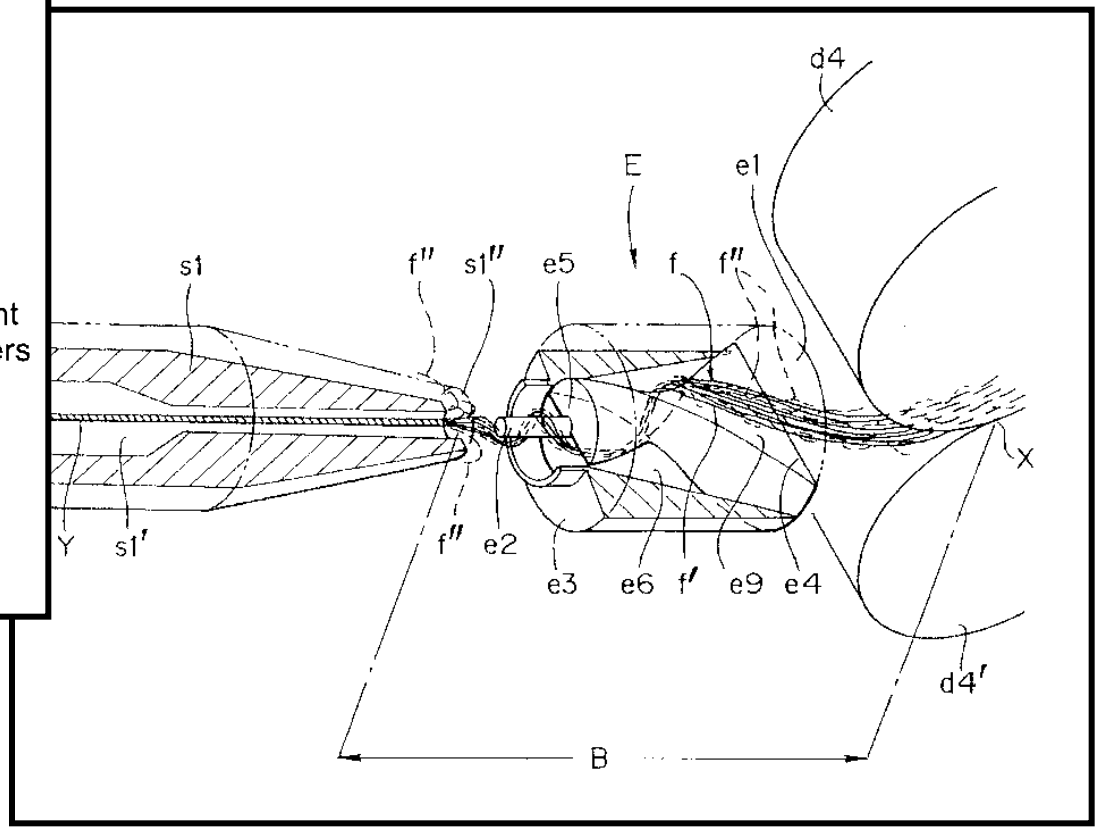
Drafting part

Spinning part

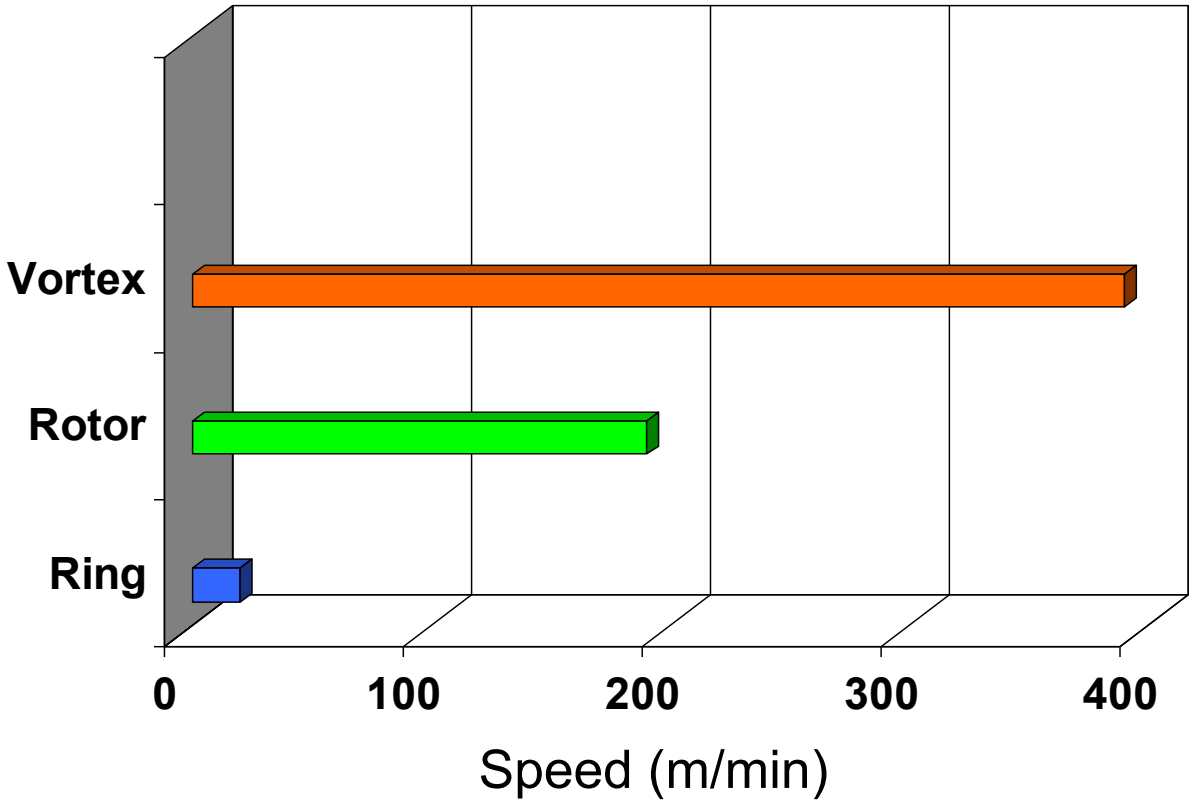
Winding part

Vortex twist insertion principle



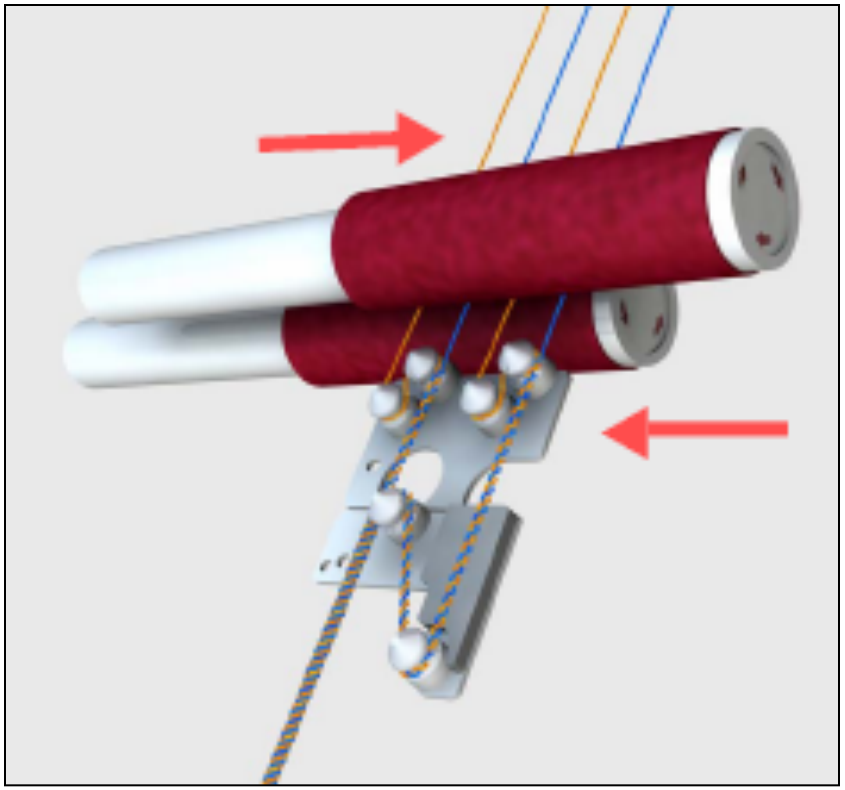


Short-staple spinning systems



Oerlikon Saurer Winpro S^4

- 4-ply knitting yarn



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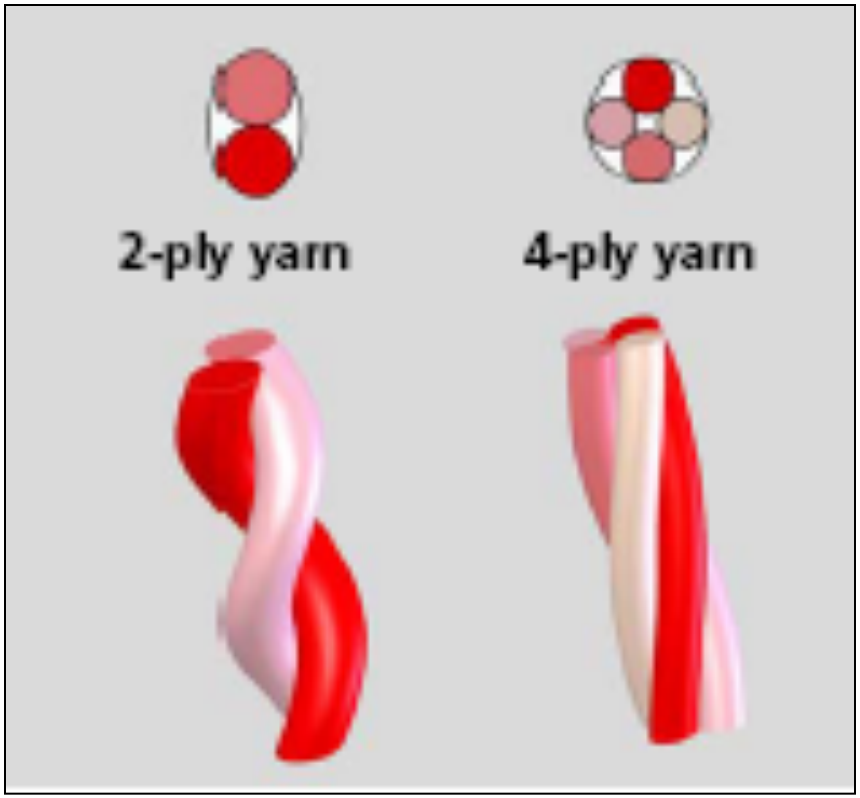

Comparisons

	Ring	Compact	Vortex	Solospun
Cost	Hi	Hi	Attractive	Reduced
Robust	Ave	Ave	Acceptable	Reduced
Flexibility	Good	Reduced	Limited	Different
Quality	Hi	Hi	Reduced	Questions
Appearance	Hi	Hi	Reduced	Questions
Distribution	Hi	Limited	Small	Questions
Market	Reducing	Stagnant	New-limited	Stagnant
Fibre needs	Reference	Ring/Long H	Short staple	Ring/Long H