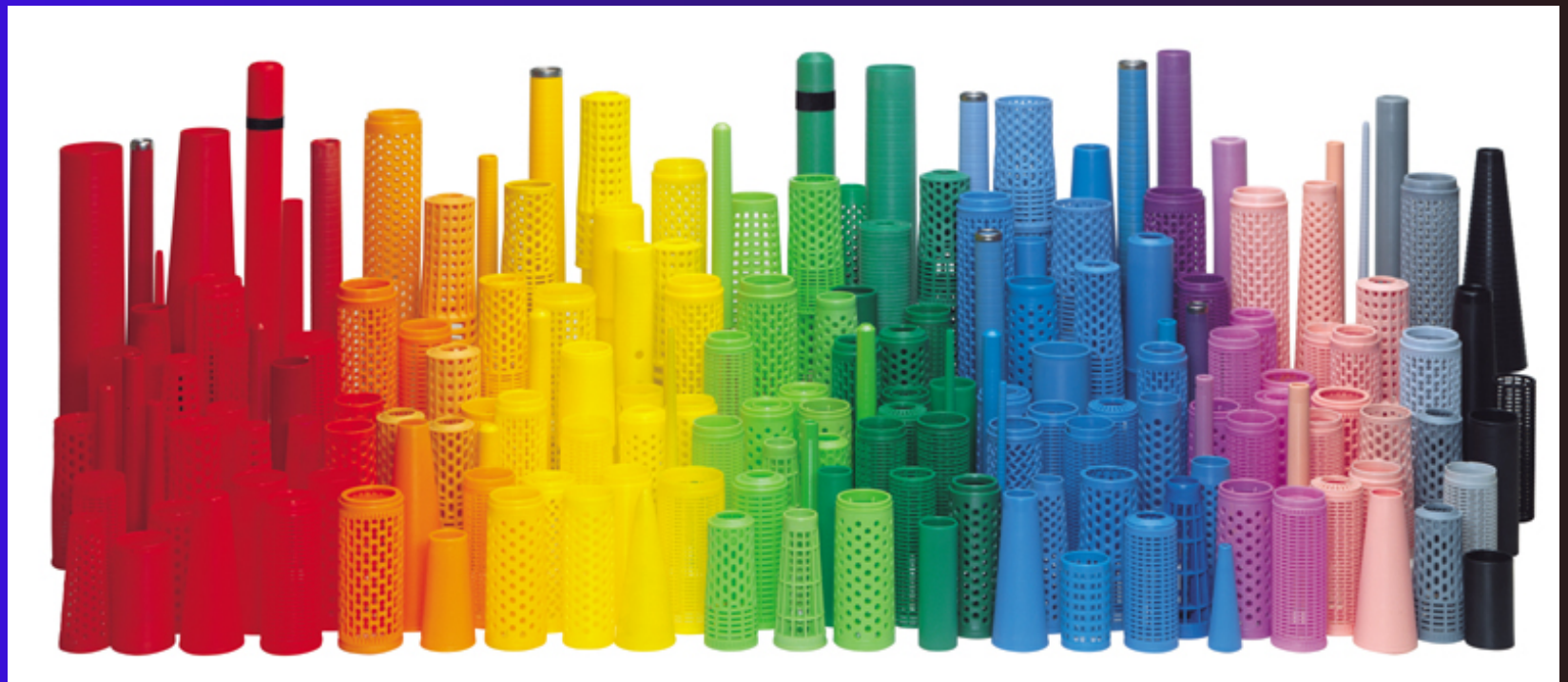


Dye tube selection for optimal results

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Tube selection: who makes the final decision?

A diagram illustrating the roles in tube selection. It features a large white oval on a black background. Inside the oval, three white rectangular boxes are arranged in a descending staircase pattern from top-left to bottom-right. The boxes are labeled 'Yarn manufacturer', 'Yarn dyer', and 'End user' respectively. The 'Yarn manufacturer' box is at the top left, the 'Yarn dyer' box is in the middle right, and the 'End user' box is at the bottom left.

Yarn manufacturer

Yarn dyer

End user

Elements to be considered when selecting the tube

- A. Tube type
- B. Tube size
- C. End use

A. Tube type

4 basic types of tubes:

1. Rigid tubes
2. Compressible springs
3. Telescopic tubes
4. Radial/axial shrinking tubes

1.Rigid tubes

ADVANTAGES

1. Largest package weights possible, lowest greige cost
2. Stable dye spindle columns
3. Transfer tail can be protected for direct use purposes
4. Packages can be pre-wound on most yarn making equipment
5. Expendable and reusable styles are available



Rigid tubes

LIMITATIONS

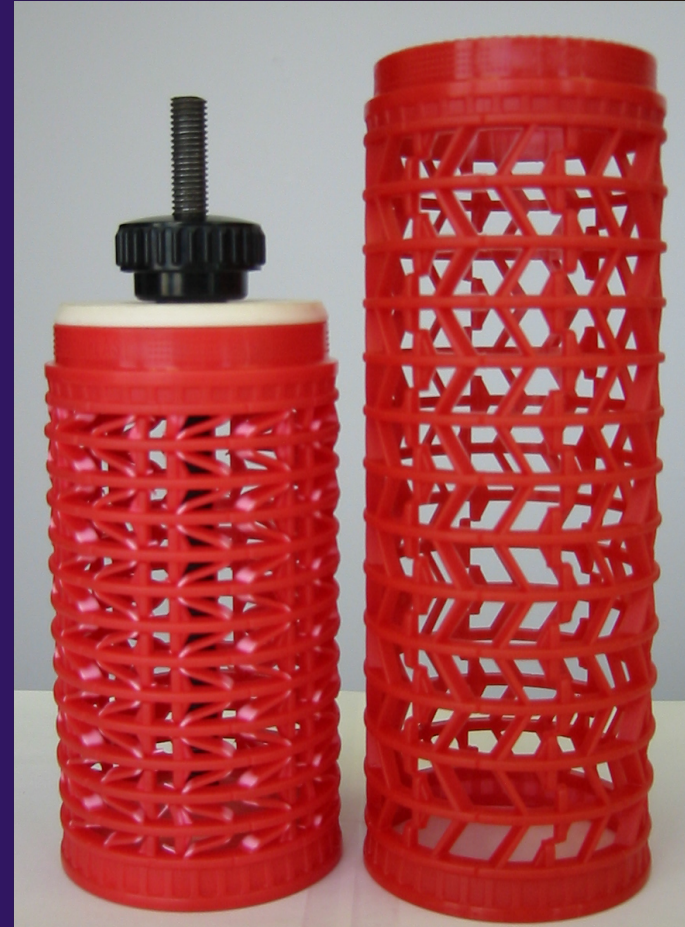
1. Package columns can not be pressed to adjust for variations in spindle lengths
2. Instead, spring loaded caps or spacers may be needed for length adaptations and to insure good seal between packages
3. Because package weights are larger, package numbers are smaller



Compressible springs

ADVANTAGES

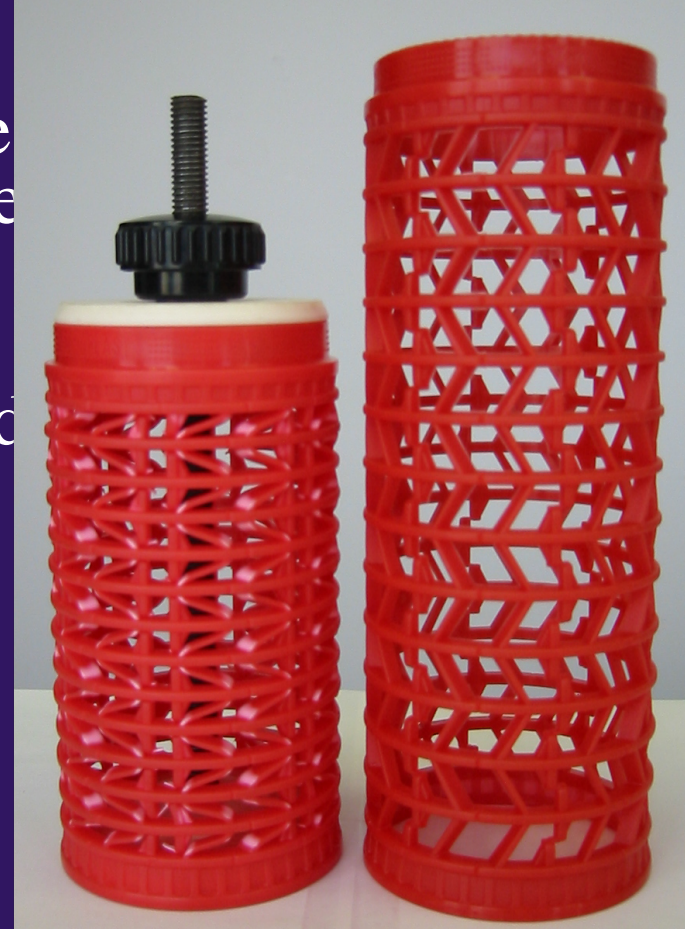
1. Leak proof columns, if properly pressed
2. Pressing helps to stabilize package density and shape
3. Because greige packages are lighter. Total number of packages is higher, an important detail when trying to meet creel requirements



Compressible springs

LIMITATIONS

1. Must have spindle press
 2. Spring loaded or fall down spindle caps may be needed to compensate for shrinking yarn packages
 3. Lower density and lighter greige packages may cost more per pound
 4. Not reusable
- (cont.)

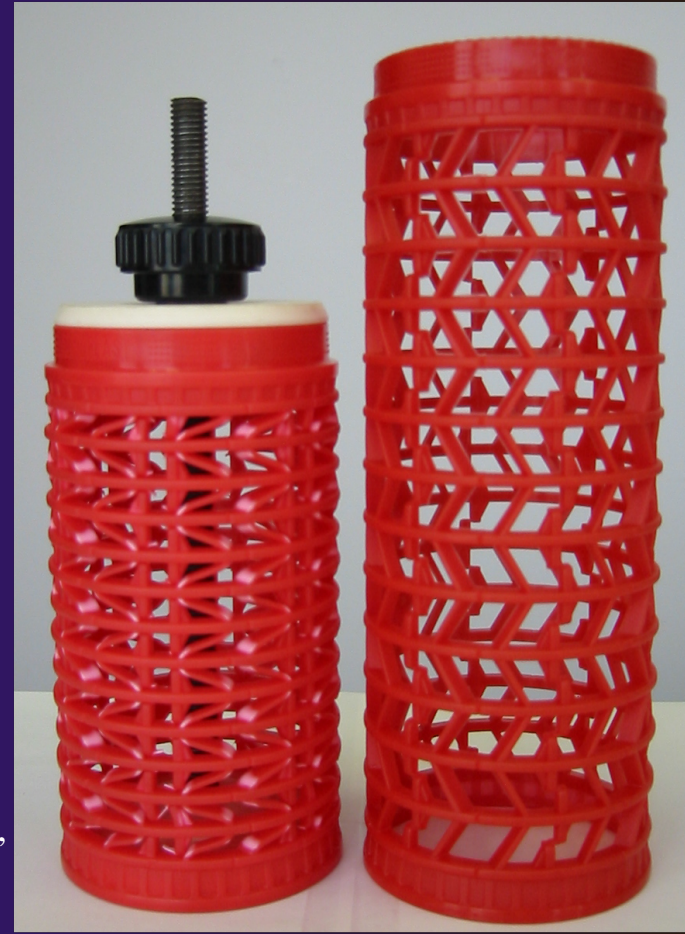


Compressible springs

LIMITATIONS (cont.)

- 5. Compression must be consistent and specific to spring design
- 6. Post-winding usually necessary
- 7. More waste and yarn damage next to dye spring
- 8. Might require filter paper or other cushion wrapped around spring

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Telescopic tubes

Advantages

1. Solid, self-supporting columns
2. Compressible up to 40%
3. Spacers and filter paper not needed
4. Pre-set stoppers on inside of tube to ensure consistent compression
5. Good yarn delivery and post winding or direct use
6. Can work well with automated package handling equipment



Telescopic tubes

LIMITATIONS

1. Must have a spindle press
2. May require special cover caps and bottom plates
3. Not adaptable to all spinning equipment
4. Not adaptable to texturing machines
5. Requires special winding setups to wind packages with slight tapers

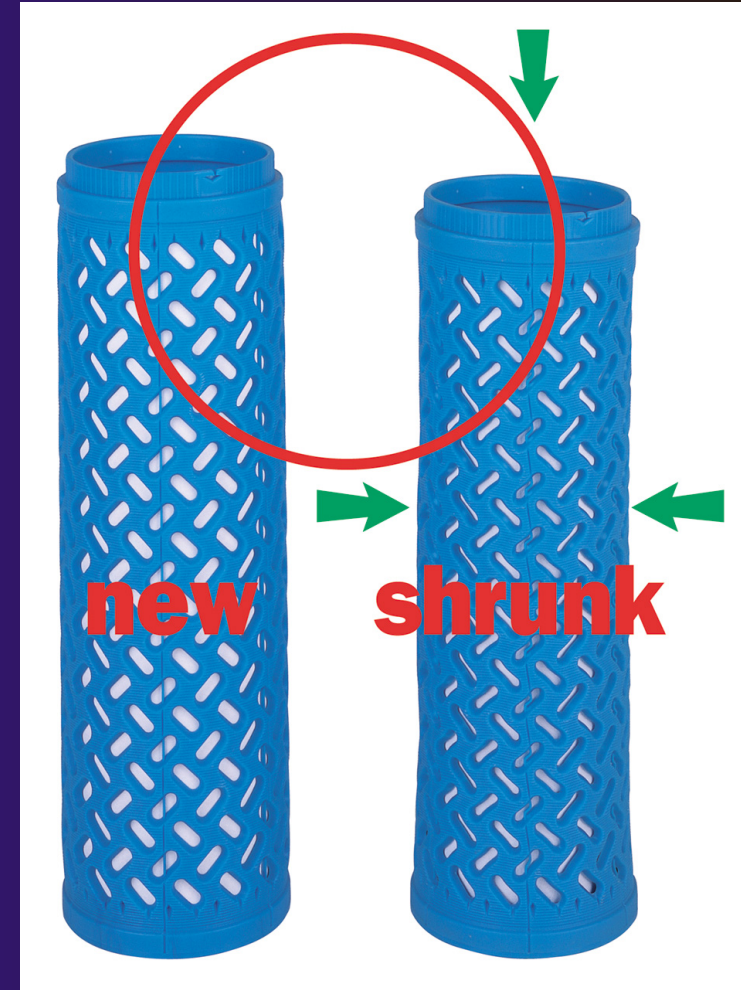


Radial/axial shrinking tubes

ADVANTAGES

1. Axial contraction up to 5% allows for slight column compression prior to dyeing and for column elongation during the cycle
2. Minimizes physical yarn damages
3. Stable columns as with rigid tubes
4. Spacers not needed

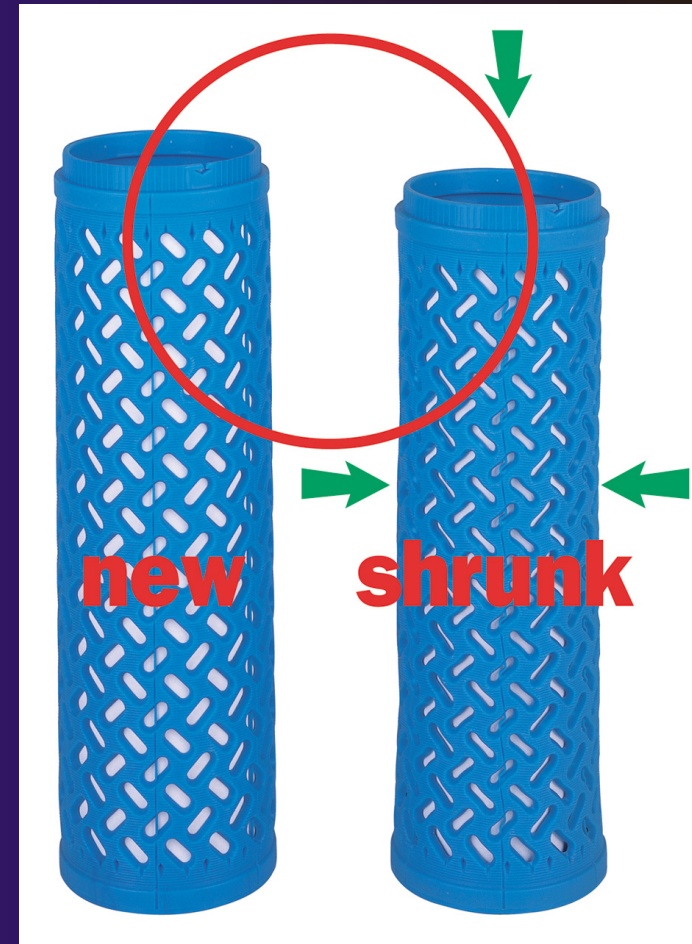
(cont.)



Radial/axial shrinking tubes

ADVANTAGES (cont.)

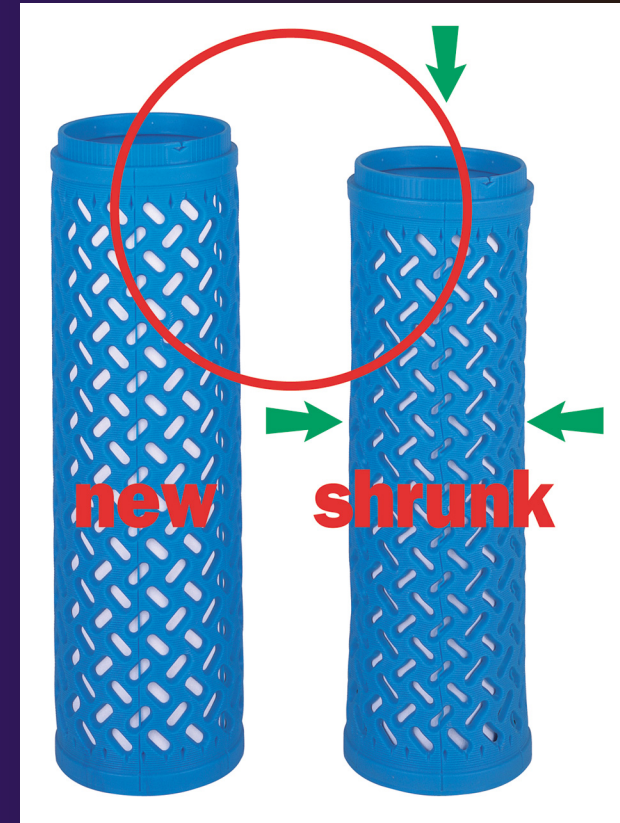
- 5. Transfer tale protection can be available
- 6. Direct use with transfer is possible
- 7. May eliminate the need to pre-set high shrink yarns
- 8. Lower yarn manufacturing costs as with rigid tubes
(cont.)



Radial/axial shrinking tubes

ADVANTAGES (cont.)

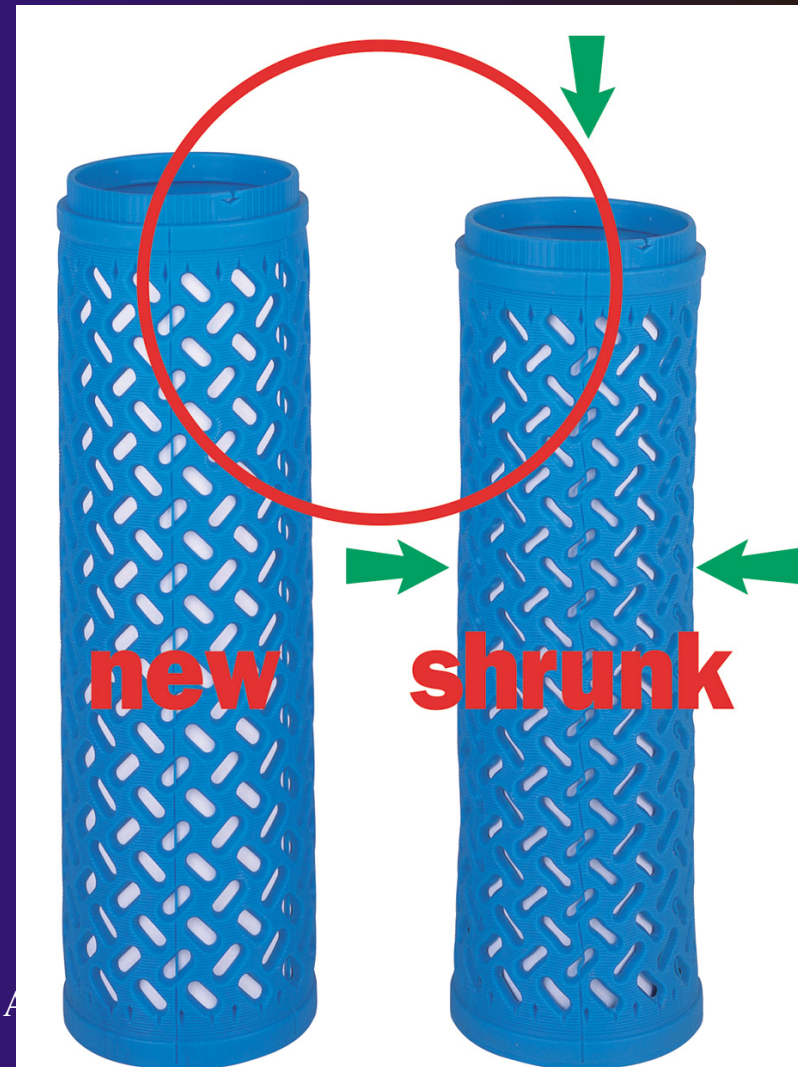
- 9. Package densities remain more even throughout the dye cycle
- 10. Filter paper not necessary



Radial/axial shrinking tubes

LIMITATIONS

1. Not reusable
2. Reduced package numbers as with rigid tubes
3. Better if slightly pressed, sealing package columns



B. Tube size

1. Length
2. Inside Diameters of the Tube

1. Length

3 basic lengths used today:

- **170 mm (sometimes called 6.75 inches)**
- **230 mm (originally described as a 9 inch tube)**
- **288 mm (11.25 inch texturing tube)**

2. Inside Diameters of the Tube

Spindle Diameter (OD)

1.25 inches or 32 mm

1.50 inches or 38 mm

1.75 inches or 44 mm

2.00 inches or 51 mm

2.13 inches or 54 mm

2.25 inches or 57 mm

2.33 inches or 59 mm

2.50 inches or 64 mm

Tube Diameters (ID)

35 mm

41, 41.5, 42, 45 mm

49 mm

54 mm

56, 56.5, 58 mm

61 mm

64 mm

68, 69 mm

Important points to remember

1. Too little tolerance between spindles and tubes can result in tubes seizing on the spindle.
2. Too much tolerance can result in “snaked” package columns and /or uneven dyeings.
3. Rigid tubes and/or low shrink yarns can accommodate less tolerance.
4. Compressible tubes and/or high shrink yarns need more tolerance.
5. Because of all the package preparation equipment and dye spindles in use today, over **sixty** combinations of different size dye tubes are made at the Mariplast Greer plant alone.

C. End use - Guideline chart

Product/End use	Rigid	Comp.	Tele.	Shrink
Low shrink spun yarn	X	X	X	X
High shrink spun yarn		X	X	X
Low shrink textured yarn	X	X		X
High shrink textured yarn		X		X
Max. package weights	X			X
Max. package # per skier		X	X	
Best for direct ship			X	X
Best for re-usable			X	
Best for min.spring crimp				X
Least expensive tubes		X		