

Yarn Spinning | For Beginners

Yarn Spinning Combining staple fibers into yarns Spinning Systems

- Spinning systems- produce a yarn based on fiber characteristics of fiber

Cotton System (staples less than 2.5 inches)

Opening

Carding

Picker: •

Fibers made parallel, oriented. Short fibers removed. Blending can take place here. Layer pulled into "SLIVER"

Cotton System

Combing

Drawing

Redrawing

This is an optional step. Only used in making certain cotton yarns. Fibers made more parallel. Short fibers removed. Smoother, superior yarns result.

Several card slivers combined for uniformity. Fibers made more parallel

Slivers combined for uniformity

Cotton System

Roving (twisting)

Spinning

Sliver attenuated (drawn out to finer diameter) and twisted. "ROVING"

Roving attenuated and twist inserted

Combed/Carded Yarns

Yarns made with the combing step included are called •

Yarns made with the combing step •

Combed yarns are of higher quality, and are more expensive than carded yarns.

Combing is not necessary •

Combed/Carded Yarns

In a combed polyester/cotton blend yarn, only the cotton portion needs to be combed.

A 50/50 polyester/combed cotton yarn is of higher quality than a 50/50 polyester/cotton yarn.

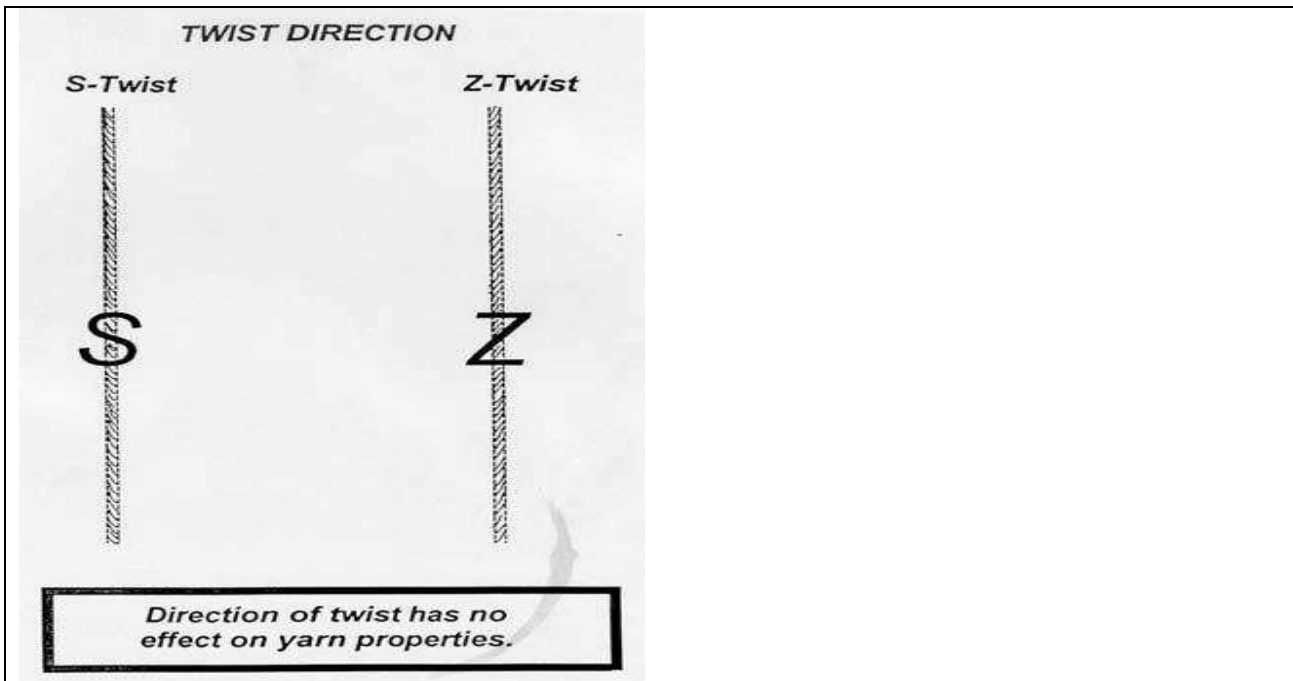
Combing is necessary for the production of high-count (fine) cotton yarns, like those used in pin point oxford cloth, but is not necessary for low-count cotton yarns, like those used in denim.

Spinning

Depending upon the direction of rotation of the spindle during yarn manufacture, yarns may have either S-twist (left hand twist) or Z-twist (right hand twist).

Single yarns, either combed or carded, may be combined by twisting two

or more together, to produce plied yarns. The ply twist is usually opposite the yarn twist.



Ring Spinning any staple fibers <2.5" size="+3">Newer Spinning Processes • Two more modern spinning processes have been increasing in popularity, because they produce yarn at a faster, more economical rate: **Open-End Spinning** Also called break spinning, this process produces yarns at least 3X faster than ring spinning, depending upon the fineness of the yarn. Carded Omits roving formation.

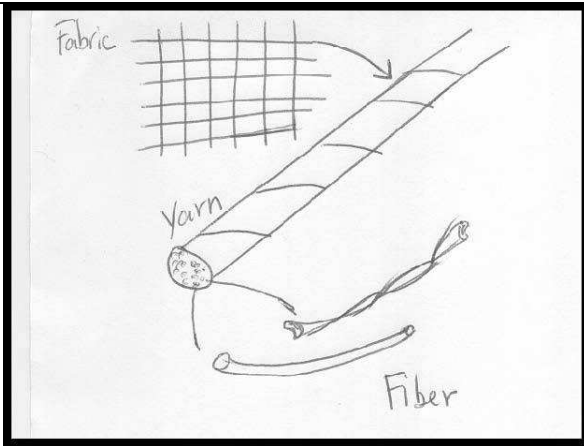
Open-End Spinning Compared to an equivalent size ring-spun yarn, open-end spun yarn is weaker but more uniform. The yarn has a smooth even surface. bulkier, rougher, more absorbent, more uniform in strength, less likely to pill Only low and medium-count yarns can be made by this process. Open-end Ring spun Air-Jet Spinning Production rate is up to 10X that of ring spinning, and at least 2X that of open-end spinning. Sliver is • Air-Jet Spinning Medium to • Air-jet yarns are weaker than either ring spun or open- end spun yarns. Long staple spinning systems • Two spinning systems exist for the spinning of the long staple (2" to 10") fibers into yarn. • Worsted System (fibers 2-10" long) Machinery is different, but process is similar to combed cotton production. Fibers are highly parallelized prior to twisting into yarn. Yarns are used for slacks, sport coats, suits, overcoats, some sweaters, and carpet. They are stronger and firmer

Woolen System Totally different Yarns are softer, warmer, bulkier, and weaker than worsted yarns. • Woolen/Worsted Yarns The warmth of any apparel or textile product is mainly due to its ability to maintain dead-air space within the yarns. Because of the high degree – – The worsted spinning of wool fibers does achieve good alignment, but at a much higher cost than in woolen spinning. **Examples of Cotton System Yarns:**

100% Cotton, for denim 100% Combed Cotton, for Blouses 65% Polyester/35% Cotton, for Slacks 50% Polyester/50% Combed Cotton for Shirts 50% Polyester/50% Rayon, for Shirts 70% Polyester/30% Acrylic, for Knits Examples of Woolen System Yarns: Examples of Worsted System Yarns: 100% Wool, for Suits 55% Polyester/45% Wool, for Suits 65% Polyester/20% Rayon/15% Acrylic, for Slacks 100% Nylon, for Carpet 100% Polyester, for Carpet

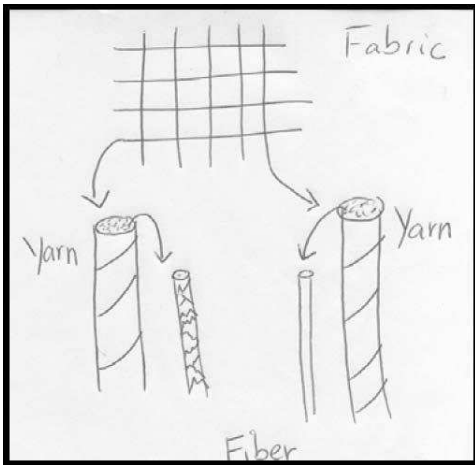
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Different fibers are present in the same yarn in planned proportions



Mixture

Mixture- yarns •
(warp of one type, fill of another)



Combinations

Combinations-

Why Blend Fibers

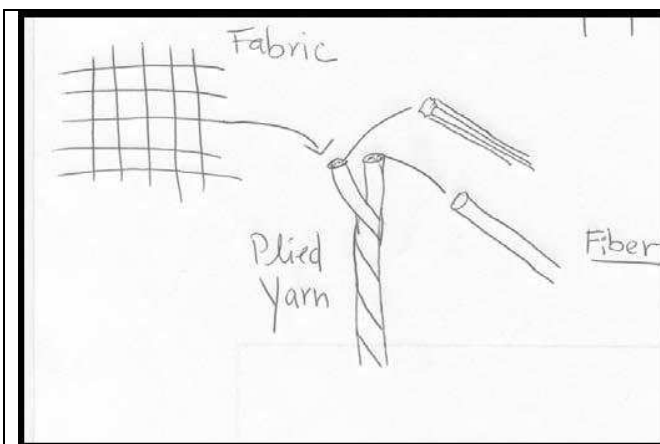
Fabrics have a better combination of performance characteristics- •

Improve spinning, weaving, finishing, uniformity

To obtain better fabric appearance- rabbit hair for certain appearance

To minimize fiber cost-

To obtain unique color effects-



Compound and Fancy Yarns Complex Yarns (Novelty Yarns, Fancy Yarns)

Complex yarns are used to provide visual interest and surface texture to a fabric. Only 5 to 10% of all yarns manufactured fall into this category.

Complex yarns are ••

Plied complex yarns usually include an effect yarn (E), a core yarn (C), and sometimes a binder yarn (B).

Continued

Named •

Plied, but seldom add strength to fabric

If used in only one direction they are used in the fill

Usually the smaller the novelty effect the more durable the fabric (less effected by abrasion, less snagging)

Tweed-

– Flecks of short colored fibers twisted into the yarn, often wool WHY?

Slub- single, spun, fancy yarns, varying yarn diameters along their length; these are usually singles.

True slub- twist varied at regular intervals (thicker less twist)

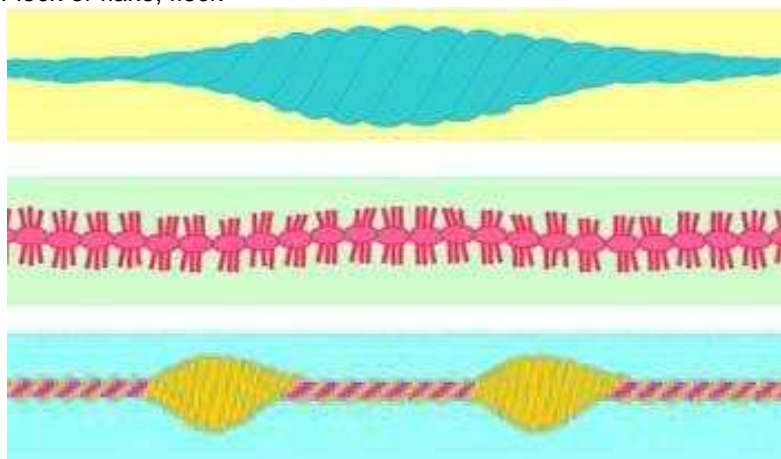
Elongated tufts of fiber into yarn at regular intervals with a core or binder yarn

Types of complex yarns

Thick and thin – ••

Chenille – Resembles a caterpillar in appearance.

Flock or flake, fleck –



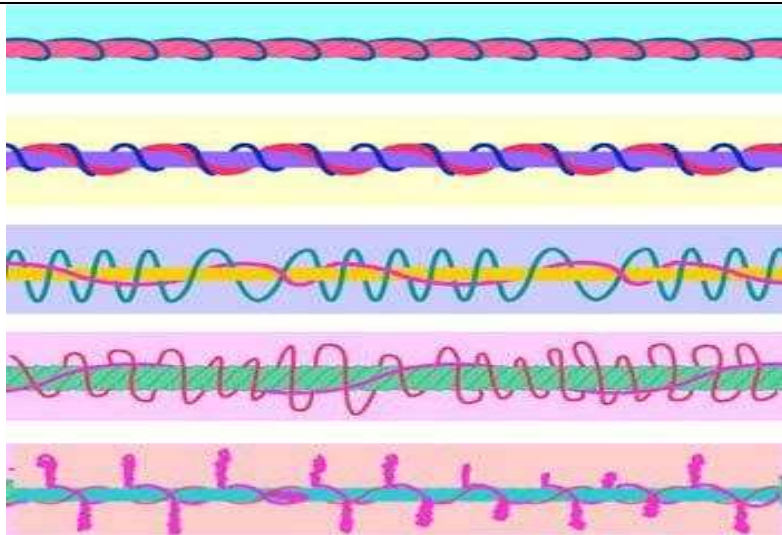
Types of complex yarns

Spiral and Corkscrew – •

Gimp and Ratiné – E and C are plied around each other; E is larger than in ratiné than for gimp, effect ply is twisted around ground. At intervals the effect yarn kinks out and back on itself.

Crepe highly twisted simple yarn

Bouclé, loop, and snarl –

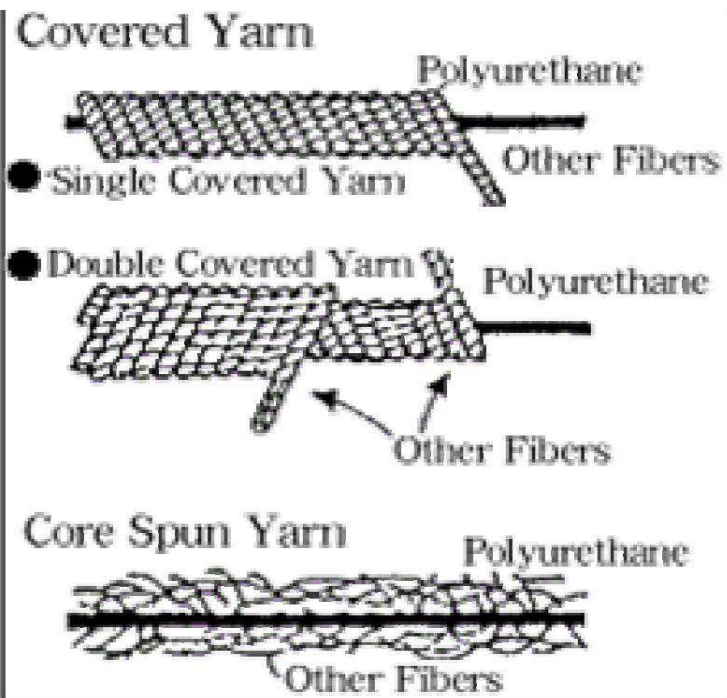


Compound or Composite Yarns

Regular in appearance along length

Covered Yarns: central yarn that is completely covered

Core Spun Yarns: Core wrapped with fiber



Yarn Quality

Will it be strong enough to withstand the stress of the loom

Better quality-