

Sabrina Wood  
Materials Research Compilation

**Article 1:** Why are some fabrics blended? The advantages and disadvantages of various cotton blends.

**Citation:**

IvyandPearlBoutique. "Why Are Fabrics Sometimes Blended? The Advantages And

Disadvantages Of Various Common Fabric Blends." *Ivy and Pearl Online Boutique*, 10

July 2019,

[www.ivyandpearlboutique.com/fashion-and-news/fashion-school/advantages-disadvantages-common-fabric-blends/](http://www.ivyandpearlboutique.com/fashion-and-news/fashion-school/advantages-disadvantages-common-fabric-blends/).

**Information:**

- Cotton
  - Advantages: soft, hypoallergenic and dust mite resistant, breathes well
  - Disadvantages: easily wrinkles and creases, weakened by light exposure
- Polyester
  - Advantages: easily dyed, light, resists shrinkage, resists stretching, resists mildew, not damaged by light, resists wrinkling
  - Disadvantages: does not breathe, shine can be unattractive, difficult to remove stains
- Nylon
  - Advantages: resilient, easy to care for, resists insects, fungi, and mildew, can melt when heat is applied
  - Disadvantages: not absorbent, can have unattractive sheen, prone to static electricity
- Wool
  - Advantages: keeps its shape, retains heat, breathable, resistant to tearing
  - Disadvantages: pills easily, weakens when wet, can itch, can mildew/ mold, weakened by light exposure
- Acetate
  - Advantages: silky appearance and feel
  - Disadvantages: dyes can fade or bleed, heat sensitive, relatively weak fiber
- Ramie
  - Advantages: resists bacteria, mildew, and insects, absorbency properties are extremely high, easily dyed, strengthens when wet, luster improves with washing, holds shape well, resists shrinkage

- Disadvantages: low elasticity, not resilient, low abrasion resistance, easily wrinkles, stiff and brittle
- Linen
  - Advantages: keeps you cool, easy to clean, strong, comfortable, absorbent, resists stains
  - Disadvantages: expensive, wrinkles easily, shrinks easily, can be affected by mildew and perspiration, shines if ironed
- Silk
  - Advantages: very hypoallergenic, soft and shiny, highly absorbent- allows your skin to breathe, durable, light
  - Disadvantages: expensive, yellows with age, requires special care, leaves water spots
- Rayon
  - Advantages: beautiful silky appearance and feel, drapes well, breathable, inexpensive, dyes easily
  - Disadvantages: easily creases, usually needs to be dry cleaned, prone to stretching and bagging, weak when wet, absorbs moisture
- Spandex/ Lycra
  - Advantages: lightweight and comfortable, resists perspiration, is elastic, durable and strong
  - Disadvantages: does not allow skin to breath, may stick to the body, is sensitive to heat
- Fiber Blends
  - When blended- weaknesses of fabric negated
  - On blended fabrics- highest content listed first
  - Cotton/ Polyester Blend
    - Common in apparel
    - Durable, maintains color well, soft, light
    - Not as breathable
  - Nylon/ Wool Blend
    - Emphasizes moisture wicking properties
    - Acts as natural insulator
    - Anti microbial
    - Blend emphasizes good quality of wool without itching
  - Nylon/ Acetate
    - Attractiveness of acetate
    - Durability, stretch, wrinkle/ shrinkage resistance (from nylon)
  - Ramie/ Polyester
    - Strong
    - Resists heat, insect, mildew, light, acids

- Wrinkle resistant
- Wool/ Cotton
  - Retain shape
  - Softer fabric
  - Breathable
  - Insulated
- Linen/ Cotton Blend
  - Strong fabric
  - Absorbent
  - Cool to the touch
  - Breathability
- Linen/ Silk
  - Luxurious = expensive
  - Durable
  - Very pretty to look at
- Linen/ Rayon
  - Combines cool comfort of linen and wearability of rayon
  - Drapes well
- Silk/ Wool
  - Shine of silk
  - Weight of wool
  - Breathable, drapes well
- Rayon/ Cotton
  - Common
  - Silky feel and appearance
  - Prone to wrinkles
- Cotton/ Polyester/ Rayon/ Spandex
  - Comfort and breathability
  - Controlled shape
  - Stretchable

**Article 2:** What is Military Fabric Called? What are Uniforms Made of?

**Citation:**

V, James. "What Is Military Fabric Called? (What Are Uniforms Made of)." *SewingIsCool.com*,

31 July 2020, [sewingiscool.com/what-is-military-fabric-called/](http://sewingiscool.com/what-is-military-fabric-called/).

**Information:**

- Heavy cotton twill
  - Used for decades

- Heavy, hot to wear, took a long time to dry
- Mid 20th century- switch to all synthetic fibers
  - Lighter
  - Drawbacks: hot, did not absorb sweat, reflected infrared light
- Blended cotton and nylon
  - More mobility and range of motion
  - Lighter
  - More difficult to apply dyes

**Article 3:** A Beginner’s Guide: What is Antimicrobial Fabric?

**Citation:**

Haddad, Leslie. “A Beginner's Guide: What Is Antimicrobial Fabric?” *Herculite*, 16 Feb. 2017, [www.herculite.com/blog/a-beginners-guide-what-is-antimicrobial-fabric](http://www.herculite.com/blog/a-beginners-guide-what-is-antimicrobial-fabric).

**Information:**

- Antimicrobial: “destroying or inhibiting the growth of microorganisms, and especially pathogenic microorganisms”
- Common in medical facilities
- Found in medical bedding, medical curtains, uniforms
- Includes pathogen fighting layer
  - Prolongs life of textiles
  - Protects the fabric surface
- Ensures longevity and allows for reuse
- Antimicrobial fabric composition
  - Polyester, polyester vinyl composites, and even acrylics
  - Effectiveness = ability to fight off microorganisms
  - Prevents bacteria and other microorganisms from attaching to fabric surface
    - Also prevents growth and spread

**Article 4:** Surface modification of biotextiles for medical applications

**Citation:**

Tessier, D. “Surface Modifications of Biotextiles for Medical Applications.” *Biotextiles as Medical Implants*, Woodhead Publishing, 2013, pp. 137–156.

**Information:**

- Antimicrobials can be leached from the fabrics when washed
  - Unable to control bad odors and fight germs
  - Most soluble in water
- Non leaching antimicrobials

- Metal based nanoparticles
- Ex: quaternary ammonium complex beads with antimicrobial activity
  - Formed mainly through covalent bonds
  - Exhibited swelling but were not hydrolyzed
  - Materials retained after ten cycles of washing
- Durable antibacterial hybrid nanofibers
  - Continuous and smooth nanofibers with Ag nanoparticles
  - Exhibited slow and long lasting silver ion release with good antibacterial activity