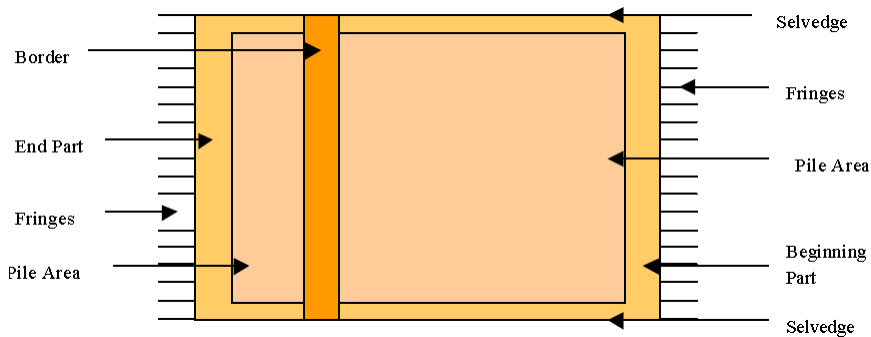


## Production and Processing of Terry Towels

### What is a terry towel?

- A textile fabric made with loop pile on one or both sides.
- The name 'Terry' comes from the French word 'tirer', which means 'to pull out', referring to the pile loops which were pulled out in classical towel making
- 'terry' weaving is considered to be originated as a fabric defect from the traditional Turkish textile industry

# Parts of a terry towel



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# Common types of towels

- Bath towels
- Hand towels
- Face towels
- Kitchen towels, etc.

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# Major requirements of a towel

- Absorbency
  - Amount of water absorption
  - Speed of water absorption
- Softness
- Antimicrobial
- Non-allergenic

# Commonly used fibers in towels

- Cotton
  - Hydrophilic
  - Able to absorb and hold large quantity of water
    - But dries slower than synthetics
  - Increases in strength when wet
  - Hypoallergenic
    - Low tendency to cause allergic reactions
  - Does not cause skin irritation
  - Can be sterilized if required
  - Economical
  - Microbial resistance is low
    - Can be improved by anti-microbial finishing

# Commonly used fibers in towels

- Cotton
  - Generally shorter staple cotton is use, with
    - Relatively lower fiber strength
    - Medium micronaire range

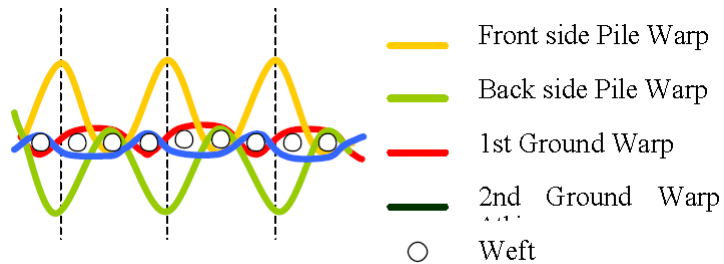
Ranges of Cotton Fiber Properties which are used in Toweling Fabrics according to US Cotton Fiber Chart 1995 (Anarjit, 1999)

Fabric Type	Fiber Length (inch)	Fiber Strength (g/tex)	Micronaire	Maturity Ratio
Toweling	0.93-1.10	20-32	3.5-4.9	0.80-0.90

# Commonly used fibers in towels

- Bamboo
- Modal
- Lyocel
- Flax
- Synthetic microfibers (polyester, nylon)

# Types of yarns in a towel



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## Pile warp

- 16/1, 20/1 Ne commonly used
- 240-255 tpm
  - Low twist used for better absorbency and softness
- Sometimes two-ply yarns may be used
- Rotor yarns may also be used for low cost

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## Ground warp

- Carded 20/2, 23/2 commonly used
- 550 tpm
- Two-ply yarns preferred for better strength
- P/C yarn may also be used
- Rotor yarn may also be used

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## Weft yarn

- Carded yarns of 16/1, 20/1 Ne
- 240-255 tpm

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## Carded vs. combed yarn vs. low twist yarns

- Carded yarns have fuzzy appearance, more hairy surface and loftier
- Low twist yarns are usually made from long staple cotton

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## Ends, picks

- For toweling
  - 20-30 ends/cm
  - 15-25 picks/cm
- For border
  - Weft density is increased 3-6 times than pile area

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## Pile/ground ratio

- Length of pile warp per unit length of fabric in warp direction
- As the ratio increases, the weight and thickness of the towel increases

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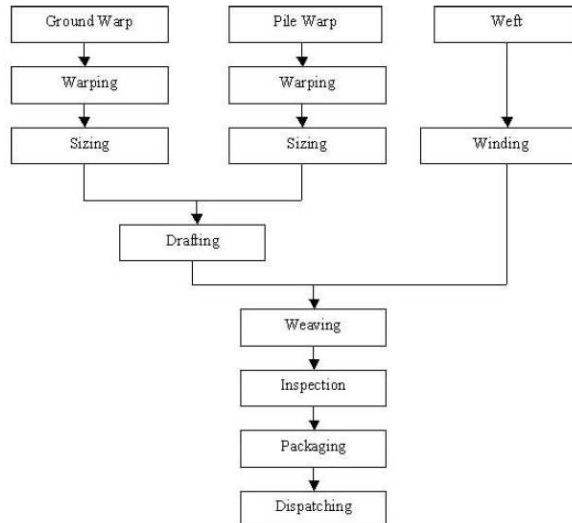
## Important properties of towels

- Absorbency
  - Depends on type of fiber, yarn properties, fabric characteristics and finishing
- Softness
  - Depends on type of fiber, yarn properties, fabric characteristics and finishing
- Heat insulation
  - Depends on thickness and entrapped air

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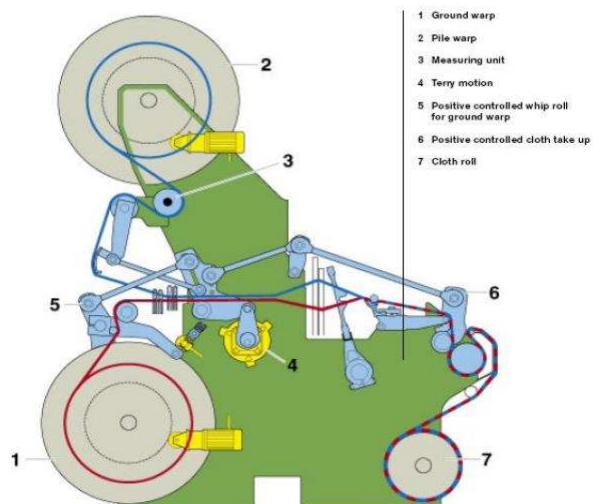


# Terry weaving flowchart



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# Terry towel weaving



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## Wet processing or terry fabric

- Desizing
- Scouring
- Bleaching
  - Optical brightening for white finish
- Dyeing
- Finishing

Yarn dyed towels may also be produced  
Printing of towels may also be done

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## Coloration of towels

- Yarn package dyeing
- Fabric dyeing
- Fabric printing

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## Dyeing towel fabrics

- Commonly used dyes
  - Reactive dyes
- Commonly used machine
  - Winch, Jet/softflow/overflow
    - Fabric in rope form
  - Pad batch, Pad steam
    - Fabric in open-width form

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## Finishing towel fabrics

- Chemical finishing
  - Hydrophilic softeners
  - Enzymatic softening
  - Antimicrobial treatment
    - If no inherently antimicrobial fiber used

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## Finishing towel fabrics...

- Mechanical finishing
  - Tumble drying
    - Gives softness, fullness, fluffiness
  - Stentering
    - To straighten up fabric and impart dimensional stability

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## Cutting and sewing

- Longitudinal cutting
- Longitudinal hemming
- Cross cutting
- Cross hemming

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## Recent trends in towels

- New fibers
- New yarns
- New weaving/designs
- Super-soft, loftier, fuller handle
- Super-absorbent/quick absorbent
- antimicrobial
- Scented
- Non-allergenic