Physical and Dimension Properties of Textile Fibres

(Fibre Fineness)

Fibre Fineness

- This is the important characteristic of any fiber; this affects the way in which a fiber will drape.
- Liner density is frequently used to measure the fineness of fibers.
- For natural fibre and yarn ‘Linear density’ is calculated and defined as the mass per unit length of fibers.
- For cotton fibers term used is micrograms per inch of fiber length. Practically fiber fineness reading are termed and recorded as micronair reading instead of micrograms/inch.

YARN COUNT/YARN SIZE/ YARN NUMBER

For Staple Yarn and Filament Linear Density also known as Yarn Number or Yarn COUNT

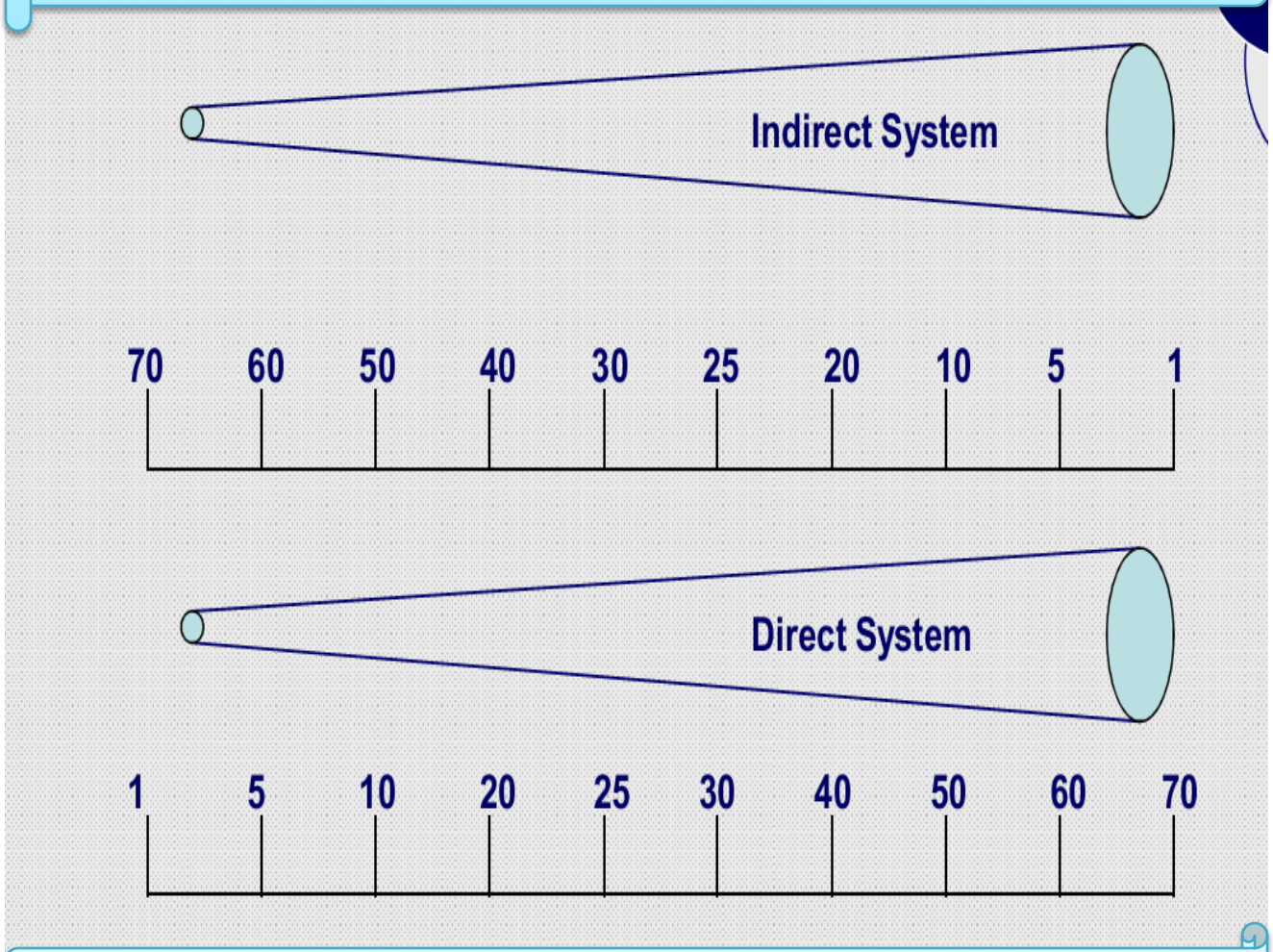
The count of a yarn is a numerical expression which defines its Fineness or Linear Density

The different systems of expressing the yarn number are:

1. **DIRECT SYSTEM**
2. **INDIRECT SYSTEM**
3. **UNIVERSAL SYSTEM OR TEX SYSTEM**

Theses systems depends on the material used for preparing the yarn are

length per unit of weight of yarn



weight per unit of length of yarn

DIRECT SYSTEM (Denier)

weight per unit of length of yarn

- The unit of length remains constant.
- This system is used for silk and manmade fibers.
- The smaller the number, finer the yarn.
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$$\text{Denier} = \frac{\text{Weight in Grams}}{\text{Length in 9000 m}}$$

INDIRECT SYSTEM (Count)

length per unit of weight of yarn

- The unit of weight remains constant.
- It is used for cotton, wool, worsted yarns and linen etc.
- The lower the count ,the coarser the yarn.
- This system is also referred as Cotton system.
- The **count** of the yarn is defined as **number of hanks per pound.**

Cotton Count

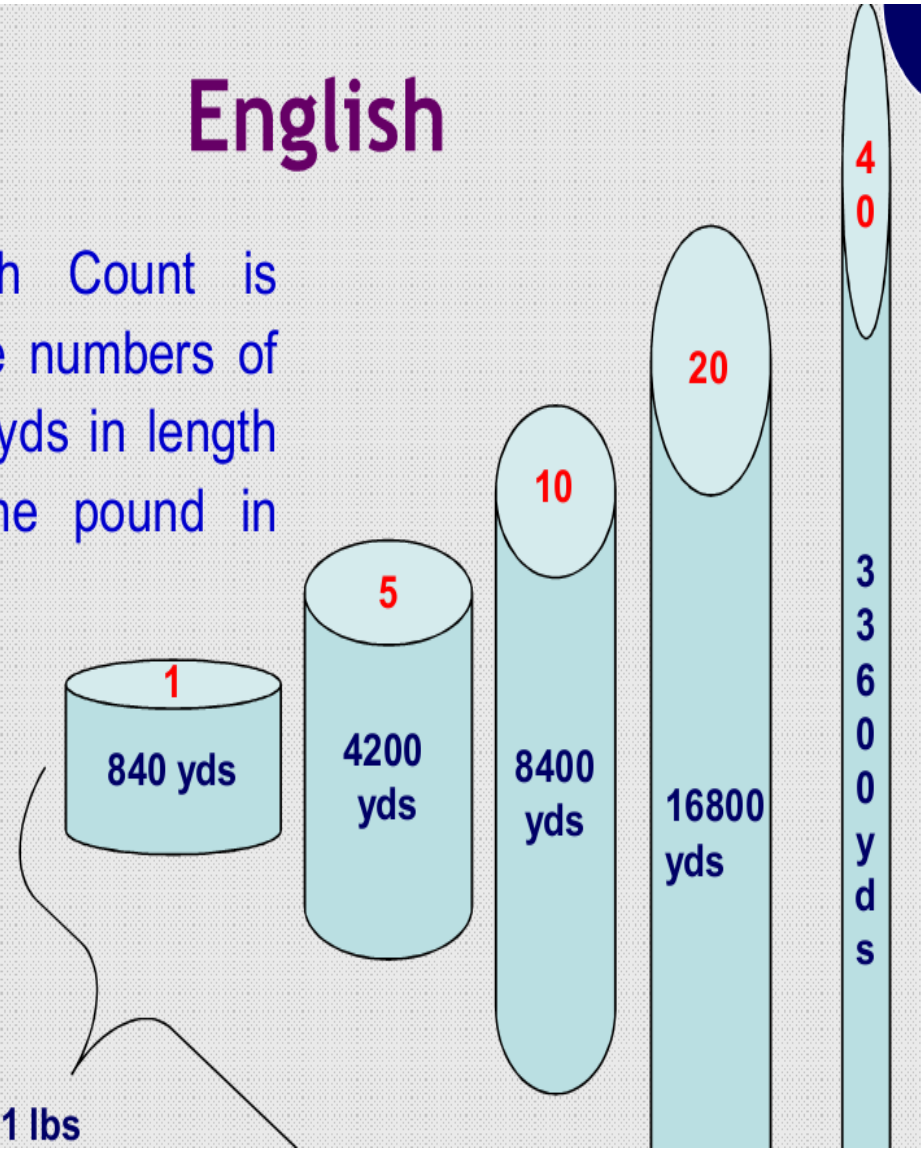
- For cotton yarns, the “English” or “cotton” count is used to express yarn fineness.
- The unit of length in an “English” count system is the hank, 840 yd, and the unit of weight is 1 lb.

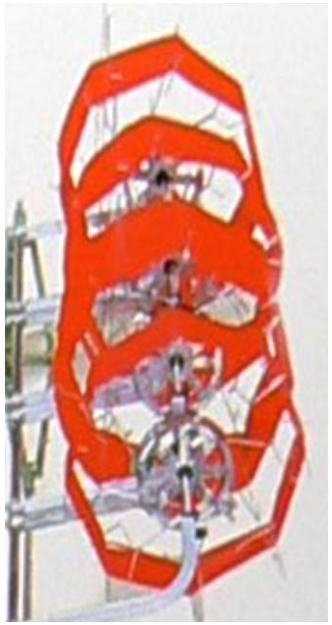
No. of (840 yards) / 1 pound

INDIRECT SYSTEM (Count)

English

- The English Count is defined as the numbers of hanks of 840 yds in length that weigh one pound in weight.





INDIRECT SYSTEM

Several indirect systems are used in practice depending on the type of yarn produced, and the spinning system.

- **Cotton count**
- **Wool count**
- **Worsted count**
- **Metric count**

An example of Indirect System

- If 40 Hanks each containing 840 yards of the yarn weigh 1 lb, then the yarn count is 40 and will be expressed as “40s” where ‘s’ stands for singles.

- If yarns of different count are twisted each count is mentioned, as for e.g. 20/30s indicates twisting together of a single 20s yarn and single 30s yarn.

Indirect Counting System = Length / Weight

(1) Cotton Count = Number of Hanks / 1 Pound

Nature of Fibre	Hank Length
Cotton	840 Yards
Spun Silk	840 Yards
Wool	256 Yards
Worsted	560 Yards
Linen	300 Yards
Jute	14400 Yards

Hank Lengths for Different Fibres (Cotton Counting System)

(2) Continental Count = Number of Hanks / 1 KG

Hank Length = 1000 metres

Woolen /Worsted Count

For wool yarns, two indirect systems are commonly used:

(i) the Woolen system, and

(ii) the Worsted system.

- In the Woolen system, the unit length (or the hank) is 256 yards, and the unit of weight is pound.

- In the Worsted system, the unit length (or the hank) is 560 yards, and the unit of weight is pound.

Metric System

- "Metric" system is commonly used in Europe.

- In this system, the unit length is kilometer, and the unit of mass is kg.

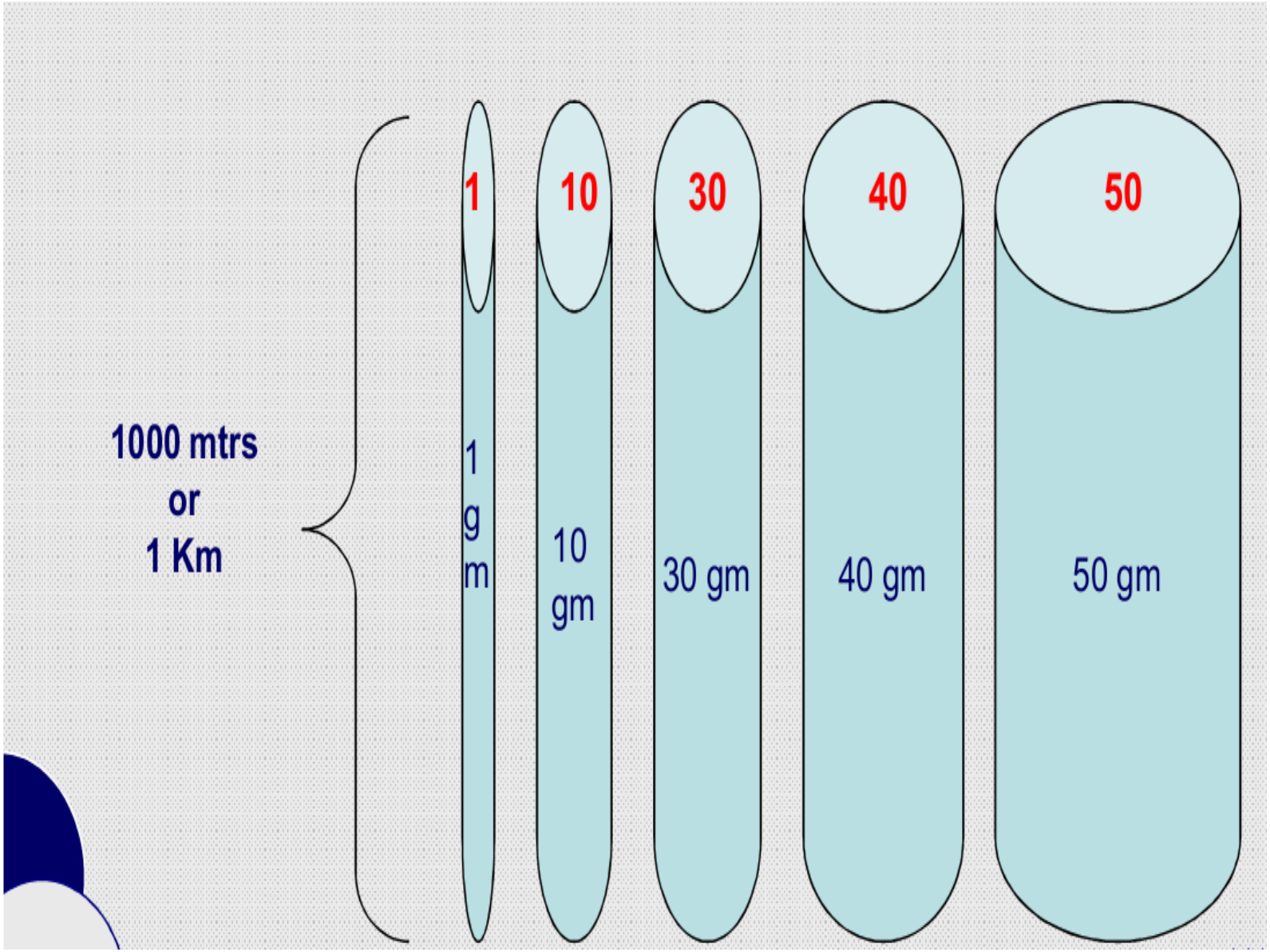
System	Formula
Direct: weight per unit of length of yarn	
• Denier	Weight in Grams/9000 m length
• Tex	Weight in Grams/1000 m length
Indirect: length per unit of weight of yarn	
• Cotton Count	No. unit length (840 yards) / 1 pound
• Wool Count	No. unit length (256 yards) / 1 pound
• Worsted Count	No. unit length (560 yards) / 1 pound
• Metric count	No. unit length (1 km) / 1 kg

UNIVERSAL SYSTEM (Tex)

- Tex system can be used from fiber to yarn stage.
- This is a direct system of yarn numbering.
- It is applicable to both natural and synthetic yarns.
- Tex is defined as the weight of the yarn in grams present in 1000 m or 1 km length.

$$\text{Tex} = \frac{\text{Weight in Grams}}{\text{Length in 1000 m or 1 km}}$$

UNIVERSAL SYSTEM (Tex)



Fibre Fineness

- Finer and longer wool and fabric are regarded as much valuable trade than the shorter and coarse ones.
- In cotton industry the importance of the fibers fineness is over shaded by the fibers length concentration, this is mainly because of the fact that the longer fibers are generally also finer.
- As the resultant of the fibers fineness is an import determine the stiffness of the yarn and fabrics and eventually its softness, handle and drapability.