TEXTILE TESTING

YARN HAIRINESS AND FABRIC TESTING

YARN HAIRINESS

- DEFINITION:

The concept of hairiness as a quantitative parameter of yarns was first definitively stated about YARN HAIRINESS is a complex concept, which generally cannot be completely defined by a single figure. The effect of yarn hairiness on the textile operations following spinning , knitting, and weaving and its influence on the characteristics of the product obtained may be as follows:-

YARN HAIRINESS

- HIGH FLUFF:- fly generation in ring frame, winding and subsequent process.
- Excessive yarn breaks at ring frame stage.
- Higher yarn breaks at knitting or warp reel.
- Pipe choking of circular knitting machines causing frequent yarn breaks and hole in the fabric.
- High pilling in knitted fabric.
- Linting problem in terry towels.

YARN HAIRINESS

TESTING METHODS AND THEIR PRINCIPLES:-

- Hairiness index tested through OH sensor with evenness tester.
- The number of hairs in several length zone counted.

YARN HAIRINESS

- HAIRINESS INDEX TESTED THROUGH OH SENSOR WITH EVENNESS TESTER:-

A constant monochrome light source shines on the protruding hairs of the yarn body, which scatters the parallel light. The yarn body itself is dark, because it is not transparent. The scattered light which is caused by those fibres protruding outside the yarn body, is bundled by a lens system and detected by optical sensor. The scattered light results from the refraction, diffraction and reflection at the individual fibres i.e. the protruding fibres appears to be luminous. The electrical output signal of the optical sensor, which is proportional to the yarn hairiness, is then converted to a digital value and evaluated by the tester.

YARN HAIRINESS

Hairiness index = total length of protruding fibres (in cm)

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total length of yarn tested (in cm)

YARN HAIRINESS

- THE NUMBER OF HAIRS IN SEVERAL LENGTH ZONE COUNTED:-

The measuring method used is based on the photometric principle. The yarn and projecting fibres interrupt a light beam, thus effecting a fluctuation in the measuring luminance of the light beam. The luminance registered in this way by a phototransistor is converted into a photocurrent, which must be amplified. In order to allow the number of hairs in several length zones to be counted, the yarn is scanned by four photo transistors. The measured values were entered into a logarithmic coordinate frame.

CRIMP

- Woven fabric made of two sets of yarns – warp and weft yarns and are interlaced with each other to form a fabric.
- When warp and weft yarns interlace in fabric they follow a wavy path. This waviness of yarn is called as crimp.

CRIMP

- EFFECT OF CRIMP OF YARN ON FABRIC PROPERTIES:

1) Resistance to abrasion
2) Shrinkage
3) Fabric costing
4) Faults in fabric
5) Fabric design
6) Fabric stiffness
7) Absorbency
8) Dimensional stability
9) Fabric handle
10) Dye take up

CRIMP TESTING

- It means yarn crimp is highly governed the consumption of material to a specific application of a fabric.
- Standard test methods for yarn crimp and yarn take-up in woven fabrics is crimp tester o tensile testing machine at a constant rate of extension

FABRIC PARTICULARS

LENGTH & WIDTH:

Depends on the yarn length and its strength. It is measured using ends per inch and picks per inch.

CRIMP:

Refers to the amount of bending that is done by thread as it interlaces with the threads.

FABRIC PARTICULARS

- FABRIC WEIGHT:

It is the weight of the yarn per square meter in the woven fabric, which is the sum of the weight of the warp and weight of the weft.

$W1 = \{n1 * 100(1+c1\%)/100\} * \{N1/1000\} g$

Where,

n1 is ends per cm.

N1 is warp count in tex.

C1% is warp crimp percentage.

FABRIC PARTICULARS

- COVER FACTOR:

It is defined as the area covered by the yarn when compared with the total area covered by the fabric. The warp cover factor is,

$k1 = n1 * \sqrt{N1}/10$

Where,

n1 = ends/cm

N1= count of warp in tex.