TECHNICAL TUESDAYS

TOPIC: YARN QUALITY

REF: TT/ Oct 2016/ WK 3

INTRODUCTION

Yarn occupies the intermediate position in the manufacture of fabric from raw material. Yarn results are therefore essential, both for estimating the quality of the raw material and for controlling the quality of fabric produced. The important characteristics of yarn being tested are:

- Yarn Twist
- Linear Density
- Yarn Strength
- Yarn Elongation
- Yarn Evenness
- Yarn Hairiness

SAMPLING

In order that the results obtained are reproducible and give reliable information about the material, the sampling must be true an representative of the bulk lot. The sampling procedure should be designed to take account of and to minimize the known sources of variability such as the variation between the spindles, the variation along the length of the bobbin, etc .The procedure for the sampling and the number of the test carried out are given under each characteristic.

AMBIENT CONDITIONS FOR YARN TESTING

Some textile fibres are highly hygroscopic and their properties change notably as a function of the moisture content. Moisture content is particularly critical in the case of properties, i.e. Yarn tenacity, elongation, yarn evenness, imperfections, count, etc. Therefore conditioning and testing must be carried out under constant standard atmospheric conditions. The standard atmosphere for textile testing involves a temperature of 20±2 °C and 65 ± 2 % RH.

In tropical regions, maintaining a temperature of 27±2°C, 65 ±2% RH is legitimate .Prior to testing, the samples must be conditioned under constant standard atmospheric to attain the moisture equilibrium. To achieve this it requires at least 24 hours.

TWIST

“Twist is defined as the spiral disposition of the components of yarn, which is generally expressed as the number of turns per unit length of yarn e.g. turns per inch, turns per metered.

- Twist is essential to keep the component fibres together in a yarn.

- The strength, dyeing, finishing properties, the feel of the finished product etc are all dependant on the twist of the yarn.

- With increase in twist, the yarn strength increases first, reaches a maximum and then decreases.

- Depending on the end use, two or more single yarns are twisted together to form “plied yarns” or “folded yarns” and a number of plied yarns twisted together to form “cabled yarn”.

- Among the plied yarns, the most commonly used are the doubled yarns, wherein two single yarns of identical twist are twisted together in a direction opposite to that of the single yarns.

- The direction of twist is expressed as “S”- Twist or “Z” – Twist. The direction depends upon the direction of the rotation of the twisting element.

- Twist take up is indentified as, “The decrease in length of yarn on twisting, expressed as a percentage of the length of yarn before twisting.

LINEAR DENSITY OR COUNT

The fineness of the yarn is usually expressed in terms of its linear density or count. There are no of systems and units for expressing yarn fineness. But they are classified as follows:

DIRECT SYSTEM

- English Count (Ne) --- Ne: No of 840 Yards yarn weighing one Pound.
- Metric Count (Nm)--- Nm : No of one Kilometer yarn weighing one Kilogram .
- French Count (Nf) --- Nf : No of one Kilometer yarn weighing in 0.5 kilogram

INDIRECT SYSTEM

- Tex ---- Weight in grams of 1000 meter (1 Kilometer)yarn
- Denier ---- Weight in grams of 9000 meter (9 Kilometer)yarn

- For the determination of the count of the yarn, it is necessary to determine the weight of the known length of the yarn. For taking out the known lengths of yarns, a wrap reel is used. The length of the yarn reeled off depends upon the count system used.

- Another factor which determines the length of the yarn taken for testing is the type of balance used. Some balances like quadrant balance, Beesley’s balance gave been specially designed to indicate the yarn count directly from the tests on specified short

- Lengths of yarn and are very useful for determining the counts of yarn removed from the fabrics. The minimum accuracy of the balance required is 0.001 mg.

- One of the most important requirements for a spinner is to maintain the average count and count variation within control .The term count variation is generally used to express variation in the weight of a lea and this is expressed as C.V % .This is affected by the

number of samples and the length being considered for the count checking .While assessing the count variation it is very important to test adequate number of leas .After reeling the appropriate length of the yarn, the yarn is conditioned in the standard atmosphere for testing before it's weight is determined .

- The minimum number of sample required per count is 20 and per machine is 2.

Have a great week ahead!

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