Useful criterian for comparing strength of yarns

In order to improve product quality, the spinners produce samples of yarn of the same count on experimental basis by changing one or other spinning condition. The remaining process conditions are kept constant. The samples are tested and the results compared to study the effect of the change on the quality of yarn produced. For example, the strength is significantly affected by the amount of twist inserted in the yarn. The yarn twist must be optimised to achieve satisfactory yarn strength as well as process productivity. However, while making comparisons of the test results rational criterian should be used to arrive at correct conclusion. The criterian generally used for comparing strengths of yarns are explained below.

Corrected lea strength

For comparing lea strengths, the actual strengths should be corrected to the nominal count by using the following formulae.

$$S2 = \frac{C_1S_1 - (C_2 - C_1)k}{C2}$$

Where C1 and S1 are the observed values of count and lea strength. C2 is the count of which strength S2 is required. K is the correction factor, value of which varies in proportion to the spinning potential of cotton. K is calculated by the following formulae.

K = 51.3 - 0.68 C

Where C is the highest standard warp count for which the quality of cotton used to produce yarn is abjudged as suitable.

Let us suppose that a spinner produces two samples of 20 Ne yarn A and B from the same quality of cotton at two different twist multipliers. Let us also suppose that the HSWC spinnable from the cotton quality is 30 Ne.

The results of tests on the two yarn samples are as under:

Particulars	Sample A	Sample B
Nominal Count	20	20
Actual Count	19.50	20.50
Actual Lea Strength	118	112.20
Lea count strength product	2301	2300

These results indicate that twist multiplier used for yarn sample A has given higher strength than that used for sample B. However, the corrected lea and lea count strength products of the yarn samples calculated by using the formulae already given above are as follows:

Particulars	Sample A	Sample B
Lea Strength Corrected to 20 Ne	114.28	115.77
Corrected Lea Count strength product	2285.55	2315.45

It would be seen from the data reported above that although uncorrected lea strength and lea count strength product of sample A are higher than those of sample B, yet the corrected lea strength and lea count strength product of sample B are higher than those of sample A.
Thus, the conclusion is that the twist multiplier used for yarn sample B has given improved yarn strength.

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