

**A METHOD FOR IMPROVING YARN
TENACITY MEASUREMENTS: DETERMINE
YARN TEX FROM THE WEIGHT OF THE
BROKEN SPECIMENS**

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Abstract

To reduce the amount of work in measuring and evaluating single end yarn breakage tests made on the Uster Tensorapid II machine, we considered the number of tests and the measurement of linear density. If linear density could be measured from the broken fragments of yarns used in any tensile tester, skein linear densities would not have to be used to calculate yarn tenacities. Yarn breaking loads were measured with the Tensorapid II tensile testing machine. Ring-spun yarns (Five yarn sizes from a Pima cotton and four yarn sizes from an Upland cotton) were used for the evaluation. Yarn skein measurements were used to determine the linear densities of each yarn. The broken yarn specimens were collected and weighed for each set of yarn sizes. Yarns of each size were broken in sets of 10, 20, 40, 60, 80, and 100. All yarns of 100 breaks were replicated. By comparing skein yarn weights with sample weights for each set of yarn sizes of constant number of breaks, the length of yarns broken and the linear density (or yarn tex) of each yarn were calculated. From these results, yarn tenacity corrected to the linear density of each set of broken yarns were compared at constant yarn size and varying number of broken yarns.

We conclude: (1) Linear density as measured from the weight of the broken sample can be substituted for skein-weight linear density for yarns of any cotton once the Tensorapid Machine has been calibrated. (2) The number of broken samples should not be less than 100 because of the variability of yarn strength along the length of the yarn and not variability of yarn linear density with length of sample.