

A Comparative Study on the Quality Control of Jute Yarn Conventional Drawing Method vs Modern Drawing Method

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Abstract: Drawing frame plays an important role on yarn quality. There are two types of processing line in jute spinning. One is conventional (traditional) and other is modern line (high speed). The difference between these two lines is due to the difference of drawing stages. In modern line mono-head high-speed type draw frame is in use, where in conventional line push-bar type draw frame is in use. The study was carried out to find out the effectiveness of the line in quality control of jute yarn. The effectiveness of mono-head high-speed type draw frame was better than conventional line push-bar type draw frame on the quality control of jute yarn.

Key Words: Mono-head, push-bar, drawing, spinning, jute yarn

Introduction

Jute is a natural cellulosic bast fibre. Due to its good spinable characteristics, it is a good textile fiber. It is well known as a golden fiber and earn highest foreign currency from this crop. Jute grows abundantly in Bangladesh having best quality in comparison with India. At present jute and jute goods are suffering many problems both in home and abroad. International market of jute and jute goods is now suffering from decreasing fund of price for not only the synthetic fiber come in competition but also the inferior quality. Jute and jute goods supplied by Bangladesh in the international market and quality control of those goods are not maintained properly (Salam, 1995 and Ranjan, 1985).

Emphasize on the quality control of jute products can at least partially overcome the present unhappy situation of the jute. Improved the quality of jute product if the condition of existing machines are good and latest designed machines are available along with qualified quality control personnel and good supervision. Maximum jute industries are running with most of the old pattern machinery, which installed during the period of, British, Indian and the early stage of Pakistan. Life cycle of maximum machines has become expired. Moreover, lack of maintenance and repairing of those machines its life has finished before maturity. India is producing good quality yarn even from low-grade raw jute using modified and developed existing machinery by qualified quality control officer and proper supervision (Atkinson, 1966).

Bangladesh Jute Research Institute (BJRI) got some new machinery, as donation under UNDP Scheme, mono head draw frame is one of them. In present study, parameter is raw jute to yarn, i.e. jute spinning, as because a good quality yarn is the prerequisite condition to get a good quality finished product. Therefore, an attempt was made to compare the quality of yarn of same count spun from same grade of raw jute by using both push bar draw frame of conventional line and mono-head draw frame of modern line.

Materials and Methods

A batch of 200 lbs. Bangla white-B (BWB) quality jute fibre was taken and passed through the softener machine with an application of 25 % normal emulsion (i.e. 20 % jute batching oil. 79.7 % water and 0.3 % nonidet) and left for 48 hours to mature. After conditioning (48 hours) it was processed with a chosen dollop weight of 16.36 kg (36lbs) through breaker card and the carded sliver was then fed to finisher card. Then finisher card slivers were divided into two groups where one was processed through mono-head or modern drawing line (1st mono head, 2nd

mono-head and 3rd drawing frame) and the other was processed through push bar or conventional drawing line (1st push bar, 2nd push bar and 3rd drawing frame). Two samples of same count of yarn of 275.6 Tex (8lbs/spy) were spun from slip draft spinning frame. The sequence of processing of jute spinning is shown in Fig. 1.

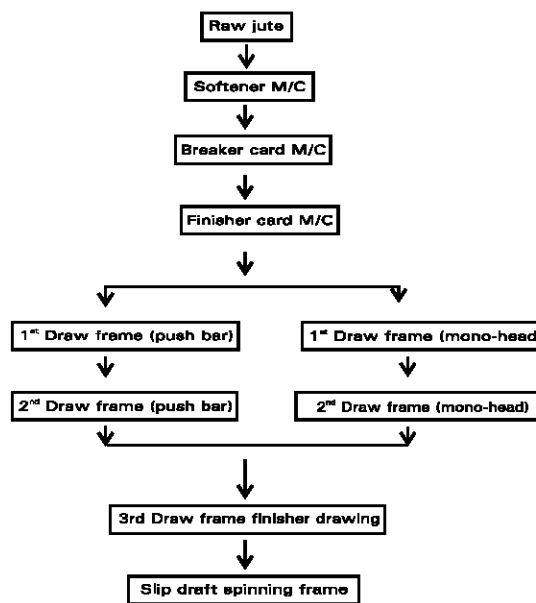


Fig. 1: Sequence of processing of jute spinning (flow process chart)

Results and Discussion

Test results of jute yarn varied from one to another due to presence of thick and thin places in the produced yarn.

Sample A: Conventional line (Table 1), raw jute processed through breaker card, finisher card, 1st draw frame, 2nd draw frame, 3rd draw frame upto slip draft spinning frame. Here doubling of 1st draw frame, 2nd draw frame and 3rd draw frame was 2:1,3:1 and 2:1 respectively (Ahmed, 1979).

Sample B: Modern line (Table 1), raw jute processed through breaker card, finisher card, 1st mono-head frame, 2nd mono-head frame, 3rd draw frame upto slip draft spinning frame. Here

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Table 1: Comparative results on performance of BWB jute yarns of 275.6 tex (8 lbs/spy) process through different drawing machinery

Sample	Nominal count tex (lbs./spy)	Actual count tex (lbs./spy)	Tensile strength Kg(lbs.) Mean \pm SD	CV % of Strength	CV % of count	QR %
A	275.6 (8)	274.22 (7.96)	2.97 \pm 0.336 (6.56)	11.27	3.1	82.34
B	275.6 (8)	273.18 (7.93)	3.34 \pm 0.106 (7.37)	3.17	3.2	93.00

CV: Co-efficient of variation, QR: Quality ratio, BWB: Bangla white B

doubling of 1st mono-head frame, 2nd mono-head frame and 3rd draw frame was 2:1, 8:1 and 2:1 respectively (Ahmed, 1979; Atkinson, 1965).

From the study, it was clearly exhibited that TS (Tensile strength) and QR % (quality ratio) was much higher and SD (standard deviation) and DV % (co-efficient of variation) was much lower of the mono-head draw frame than that of push-bar draw frame which reveals that the quality of jute yarns (Table 1). Jute yarn passed by mono-head draw frame was far better than that of push-bar draw frame where there was very negligible variation in count of both lines (Table 1).

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