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# National University of Science and Technology

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**FACULTY OF INDUSTRIAL TECHNOLOGY**

**DEPARTMENT OF TEXTILE TECHNOLOGY**

**FINAL YEAR PROJECT ON:**

# Optimization of knitting machine parameters to knit low grade cotton yarns at low cost.

By;

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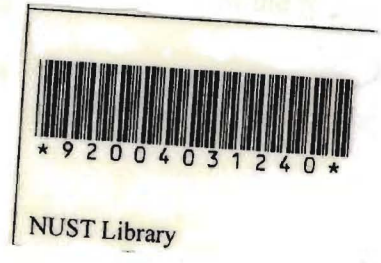


**A Dissertation submitted in partial fulfillment of undergraduate study for the Bachelor of Engineering in Textile Technology Honours Degree**

Supervisor: Professor L.C Nkiwane

Date: 17 June 2011

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# Abstract

The processing parameters used for knitting both high and low grade cotton yarns at Textile Mills company, have been the same on the fine gauge LDM circular knitting machines. It is very difficult and expensive to produce the cheap goods using the low grade cotton yarns than using high quality cotton yarns as the products were sold at low cost due to poor quality. During knitting with low grade yarns, frequent machine stoppages, down time, machine parts damages, excessive fluff and dust were encountered.

The yarn supplied at Textile Mills was recognized as low grade cotton yarn according to the standards. However the yarns physical properties and characteristics were tested at the laboratory. The major operating machine parameters were investigated, including their effects on the machine performance and influence to the quality of products.

After the experiment, the yarn count was found to be of 21 tex which slightly deviating away from the required range between 15 to 20 tex. yarn strength being of 4.5N far from the required strength, twist factor of 3419.5 close to softness, impurity content (amount of impurity content to fibre weight 20% of level) supplied from spinners.

Four major parameters were identified and analysed which were stitch length , take-down tension, yarn input tension and the machine speed having the greatest impact. The experiment illustrated the effects of each parameter during the knitting process with the low grade cotton yarns and how these parameters were controlled to accommodate low grade cotton yarns. The results obtained were analysed and the best possible operating parameters were derived and selected. Knit ability was achievable with a minimum number of faults and machine stoppages minimized in this case with on yarn breakages observed and improved quality of products.