

INCIDENCE OF DUST AND SILICA IN SPINNING PREPARATION WASTE OF SELECTED COTTONS**Lakshmi Padmaraj****Mourad Krifa****The University of Texas at Austin****Austin, TX****Abstract**

Cotton dust has always been a source of concern for the textile industry. It is seen to have adverse effects on the quality of yarn, the productivity of the spinning mill and the health of the workers. Much work has been done on the byssinosis and other effects of cotton dust on the health of mill workers. This research focuses on the other problems caused by dust, i.e., its impact on quality and mill productivity. A particular attention is given to the abrasive silica, which when present in cotton dust, are thought to accelerate the wear of card wires and other moving parts in spinning preparation machinery. The objectives of the present study are: 1) to identify the factors influencing dust content in cotton, 2) to examine the relationship between the amount of dust detected by gravimetric or electro-optical methods and the silica content, and 3) to assess the difference in silica content of cottons of various origins. The first two objectives were investigated using stripper-harvested cotton samples with differing degrees of lint cleaning at the gin. The samples were put through spinning preparation and the dust was quantified using an MTM and an AFIS at each stage of the process. The samples were also ashed and silica contents were determined. The results showed that the degree of lint cleaning at the gin has an impact on the amount of dust in raw lint but no impact on the dust in the card sliver. Although lint cleaning does not appear to impact dust in card sliver, more cleaning at the gin reduces the amount of dust to which spinning preparation equipment is exposed. Thus, if the dust is abrasive due to the presence of silica, gin cleaning would reduce the wear of spinning preparation equipment. No significant relationship was observed between the level of dust in raw fiber measured by AFIS and the silica present in it. Finally, the analysis of spinning wastes of 22 commercial bales from different growth seasons and from two growth regions, showed no significant difference in the levels of silica between origins.

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