



Detecting the Cotton Trash Particle Size Distribution in Mill Laydown using HVI™ Trashmeter Software

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ABSTRACT

Cotton trash is known to affect textile -processing efficiency. Removal of cotton trash is a means to improve textile spinning. To combat trash and efficiency problems, textile mills frequently specify that cotton bales, which they acquire, should be no higher than a 3 leaf for processing on Murata Airjet Spinner (MJS) or Murata Vortex Spinner (MVS) equipment. This leaf grade cut-off point is based on past spinning experiences, which point toward processing problems during weaving and excessive loom stops. This research evaluates how High Volume Instrument (HVI™) Trashmeter software analyzes cotton trash and its particle size distribution in a 40-bale textile mill laydown. This study compared the distribution of particles within all bales and how similar these bales were to one another and HVI™ properties throughout the bales. Bales of known and constant leaf grade appear to have different trash particle size distributions. Further work is needed to determine if trash particle distributions provide sufficient information for the measurement of cotton trash in high-speed textile spinning.

Keywords: Cotton, trash, bales, quality, High Volume Instrument, textile industry, fiber testing

Introduction

One cotton bale contains approximately 60 billion fibers (Steadman, 1997) and unidentified levels of trash and dust particles. Since cotton is produced in the field rather than at a manufacturing facility, it is difficult to control all trash generated in harvesting. Cotton is one of the most important natural fibers with trash analysis typically performed prior to processing. Cottons and their trash components are diverse in nature and respond differently to textile cleaning and further processing. The type and amount of trash, fiber-to-trash adhesion, and how well its behavior mimics a fiber determines the

ease of trash removal. Textile processing is influenced by trash components and according to Deussen (1993), trash is a measured property that can indirectly influence the strength and structure of yarn while directly influencing non-uniformity, imperfections, and yarn breaks.

Trash particles originate from the cotton plant including different parts of the leaf, stem, bark, seed, and hull or from the local environment including grass, sand, dust and other contamination. Cotton contamination including large trash and small pepper trash is commonly referred to as visible foreign matter. Cotton contains trash with conflicting issues such as leaf vs.