

**NONAQUEOUS VOLATILES IN COTTON AND LOW TEMPERATURE DISTILLATION WITH NIR
CONFIRMATION****Sherwin Cheuk****J. G. Montalvo****B. D. Condon****T. M. Von Hoven****T. F. North****Southern Regional Research Center****New Orleans, LA****Abstract**

The level of cotton moisture directly affects the mechanical, electrical, and dimensional properties of the fiber. However, the cotton industry lacks an accurate standard method for the measurement of cotton moisture. The weight difference between the standard oven drying (SOD) in air and the volumetric Karl Fischer titration (KFT) method can be attributed to factors other than moisture. Another problem with SOD is the lack of regain of the original moisture, thus the lack of retention of the original mechanical properties of the fiber. In this study, four gases, argon (Ar), nitrogen (N₂), helium (He), and dry air, were used at various temperatures on a ginned raw cotton (2001 crop year). KFT was used to verify the results. After the water was completely removed, as verified by *in vitro* NIR, the cotton weight loss was recorded, and the cotton container was left open in a standard conditioning lab (72°C and 65% RH) for over 48 hours and its weight was recorded thereafter. The average weight loss under N₂ at 75°C within 1 hour was within 0.1% of the KFT values and the cotton did not exhibit any hysteresis effects. Using less than 100°C, this method is referred to as the Low Temperature Distillation (LTD) method. Helium also was able to remove the moisture, but argon, even at 105°C after 3 hours, was not able to remove all of the water.