

FAQ : AFIS and HVI

4. State the various parameters measurable in AFIS and HVI? Briefly explain the testing principles of both.

Answer:

AFIS measures the following fiber parameters,

- Fiber Length
- Fiber maturity
- Trash content
- Nep content

HVI measure the following fiber parameters,

These are length, Uniformity, Short fiber index, Micronaire, Maturity index, Strength, Elongation, Color and Trash, and Moisture content.

HVI testing principle

Micronaire: Micronaire Reading

Measured by relating airflow resistance to the specific surface of fibers.

Maturity: Maturity Ratio

Calculated using a sophisticated algorithm based on several HVI™ measurements.

Length: Upper Half Mean Length, Uniformity Index, Short Fiber Index

Measured optically in a tapered fiber beard which is automatically prepared, carded, and brushed.

Strength: Strength, Elongation

Strength is measured physically by clamping a fiber bundle between 2 pairs of clamps at known distance. The second pair of clamps pulls away from the first pair at a constant speed until the fiber bundle breaks. The distance it travels, extending the fiber bundle before breakage, is reported as elongation.

Moisture: Moisture Content

Moisture content of the cotton sample at the time of testing, using conductive moisture probe.

Color: Rd (Whiteness), +b (Yellowness), Color Grade

Measured optically by different color filters, converted to USDA Upland or Pima Color Grades or regional customized color chart.

Trash: Particle Count, % Surface Area Covered by Trash, Trash Code

Measured optically by utilizing a digital camera, and converted to USDA trash grades or customized regional trash standards.

AFIS test principle

USTER® AFIS PRO is an optical system. The fiber sample is opened into individual fibers in the opening unit, and are then passed in the free airflow by the opto-electronic sensor. The pulses generated by the sensor are converted into electronic signals and evaluated by a computer.

One sensor distinguish between individual fibers and neps and second sensor is required for the trash and dust particle measurement. After the test has been completed the fiber, neps, dust and trash particles are deposited into waste container.

Measurements and Calculations

All measurements are performed optically on individual fibers and events (neps and trash).

Nep Classification:

Fiber and seed coat nep count per gram and size (μ m) distribution.

Length: Fiber length by number and by weight distributions; short fiber content by number and by weight (%).

Maturity: Maturity, immature fiber content (%) and fineness (mtex) distribution.

Trash: Dust and trash count per gram and size (μ m) distribution; visible.

MEASURING PRINCIPLE OF SINGLE FIBER TESTING

In the fiber individualizer unit, the sample is mechanically opened and separated into single fibers by an air stream. The trash and dust particles are filtered off, and an air stream transports the fibers and neps to an electro optical sensor, which produces characteristic waveforms. The filtered off dust and trash particles are measured by a second sensor. The resulting electronic signals are transmitted to a microcomputer, which recognizes and evaluates the impulses. After calculating the statistical results, all values are presented on the screen and printer.