DETERMINATION OF EFFICIENCY BASED ON THE COMPARISON OF ANALYSIS RESULTS OBTAINED ON ASX-1 AND HVI 900 LABORATORY EQUIPMENT

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Abstract: The article describes the advantages and disadvantages of ASX-1 laboratory equipment and HVI 900 modern equipment, their differences, the selection and analysis of the most suitable equipment for a cotton ginning enterprise.

Key words: HVI 900 equipment, ASX-1 equipment, cotton, fiber, microfiber.

ASX-1 laboratory equipment: This equipment is designed for testing cotton in laboratory equipment, determining the specific tensile strength, ripening coefficient, linear density and micronaire index of cotton fibers.

The operation of the equipment is based on the connection between the aerodynamic resistance of the material and the technological properties of the fiber and the air permeability of the fiber material.

To determine fiber properties, the sample is cleaned of impurities in the LKM device.

When the moisture content of the cotton is higher than 12%, it is dried in the laboratory dryer SXL-3 before cleaning in the LKM device.

The effect of cotton sample moisture exceeding the specified limit of 8% on the measurements is automatically corrected.

HVI 900 equipment: HVI (Eich Vi Ay) is an abbreviated name of the high-performance High Volume Instruments test measuring system for cotton fiber

length, length uniformity, elongation at break, micronaire color and contamination indicators.

Figure 1. Overview of HVI 900 equipment

Appearance samples are samples of cotton fiber approved in the prescribed manner, representing a set of quality definitions in terms of color, presence of spots, structure and contamination characteristic of a specific type and class of cotton fiber. Samples are prepared separately for long fiber and medium fiber cotton fiber.

14 fiber parameters can be determined on HVI 900 equipment. These are: Micronaire Index, Staple Length of 1/32 inch, High Average Length, Average Length, Length Uniformity Index, Spoiled Area, Short Fiber Index, Yellowing Level, Reflectance , tresh code, number of impurities, specific breaking strength, elongation at break area of impurities.

Indicators	HVI method	Class method	Special methods
Type	+	+	+
Var	+	+	+
Class	+	+	+
Microneur indicator	+	+	+
Upper average length, mm	+		
Staple length, in 1/32 inch	+	+	
Light reflection coefficient (Rd), %	(+)		
Degree of yellowness (qb)	(+)		
Relative breaking strength, Gs/tex (ch/tex)	(+)		
Area of trash code or dirty mixtures, %	(+)		
Number of impurities	(+)		
Elongation at break, %	(+)		
Length uniformity index, %	(+)		
Short fiber index	(+)		
Staple mass length, mm			+
Linear density, m/tex			+
Coefficient of ripeness			+
Mass fraction of defects and impurities, %			+
Mass ratio of moisture, %			+

In the HVI 900 equipment, 14 fiber indicators can be determined, and in the ASX-1 equipment, 4 fiber indicators can be determined. In the HVI 900 equipment, it is possible to determine the class, grade and type of fiber at the same time, while in the ASX-1 equipment, only the grade can be determined. In order to check the accuracy of the HVI 900 equipment, the accuracy level of the equipment is checked

by calibration (equipment calibration) before starting work, a direct sample is placed on the ASX-1 equipment and the error coefficient is added. On the HVI 900 equipment, a sample is taken and determined once, on the ASX-1 equipment, 3 samples are taken, and if the results are not correct, another 2 samples are taken and determined. In the HVI 900 equipment, all the results are displayed on the monitor, and can be printed using a printer, and in the ASX-1 equipment, the results are recorded. The results are determined after turning on the HVI 900 equipment 4 hours earlier, and the results are obtained without waiting for the ASX-1 equipment. It takes more than 5 minutes to get all the results on the HVI 900, while it takes 1 minute to determine 4 indicators on the ASX-1.

The HVI 900 and ASX-1 equipment are semi-automatic, and the level of accuracy is higher in the HVI 900. Currently, the HVI 900 equipment is only in the Quality Center and is used only for certification. In cotton cleaning enterprises, a special method (with the help of equipment) and a classifier method are used. The HVI 900 equipment is a state-of-the-art American technology that is cost-effective for cotton gins to import and install. HVI 900 equipment is being delivered to cotton ginning enterprises gradually. ASX-1 equipment is obsolete equipment and is hardly used in enterprises. HVI 900 equipment is the most convenient and modern.

In conclusion, it should be said that now, on the initiative of the President, almost all cotton ginning enterprises are using new version of equipment instead of obsolete equipment. A clear confirmation of this is that the practical manual of the aforementioned ASX-1 equipment gave way to the HVI system.

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