

## DETERMINATION OF DIFFERENT MOISTURE CONTENT OF SEEDED COTTON IN TOWER DRYING DRUM OF COTTON RAW MATERIAL AND IMPROVEMENT OF TECHNOLOGY

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### Abstract

This study investigates methods to improve the determination of moisture content in seeded cotton within tower drying drums used for cotton raw material processing. Efficient moisture control is crucial for maintaining product quality and optimizing processing efficiency. By enhancing moisture measurement techniques and refining drying technology, this research aims to improve accuracy, reliability, and effectiveness in moisture content determination. Various strategies, including sensor integration, data analytics, and process optimization, will be explored to advance technology and enhance the performance of tower drying drums for seeded cotton.

**Keywords:** Saw drum, colosnik grill, air nozzle, dirt removal auger, brush.

### Introduction

Tower drying drums are integral to the cotton processing industry, facilitating the removal of moisture from raw cotton to meet quality standards. However, accurately determining moisture content, particularly in seeded cotton, presents challenges due to variations in seed distribution and moisture levels. This study focuses on improving moisture content determination methods and enhancing drying technology to address these challenges and optimize processing efficiency [1-4].

Preparation of cotton raw material for processing means keeping it free of defects and damage before production. Modern drying drums have unique

universality in the processing of cotton raw materials and are designed for the storage and transfer of cotton raw materials to the technological process [5-7].

At the present time, cotton ginning enterprises use modern technology, i.e. 2SB-10, SBO, and SBT brand drying drums installed in the drying and cleaning department to achieve high levels of drying efficiency. In the direct cleaning department, there are also modern cleaning machines, such as the UXK cleaning flow-line unit, Mekhnat cleaning machine and other equipment [8-12].

The task of the dryers is to prepare cotton raw materials for storage at the preparation points, to achieve the conditions intended for one-time drying, that is, it should have a high productivity in terms of moisture. Secondary drying has a bad effect on externalization, which has a negative effect on production and costs. The function of the indicators is to transfer cotton raw materials to processing - to achieve the productivity of cotton raw materials, to ensure even and smooth drying of fibre and seed, to give fibre properties, and to increase their resistance to mechanical impact.

#### **The main part**

At the present time, cotton ginning enterprises use modern technology, i.e. 2SB-10, SBO, and SBT brand drying drums installed in the drying and cleaning department to achieve high levels of drying efficiency. In the direct cleaning department, there are also modern cleaning machines, such as the UXK cleaning flow-line unit, Mekhnat cleaning machine and other equipment.

Ensuring the smooth operation of the equipment in the technological process of the initial processing of cotton and the control of the technological process. At the same time, it is considered one of the main reasons for resource-saving equipment in the technological process, increasing the F.I.K of the equipment. For this purpose, an automatic bunker feeder is installed so that the equipment in the technological process works smoothly.

Its circuit structure is shown in Figure 1 (a and b).

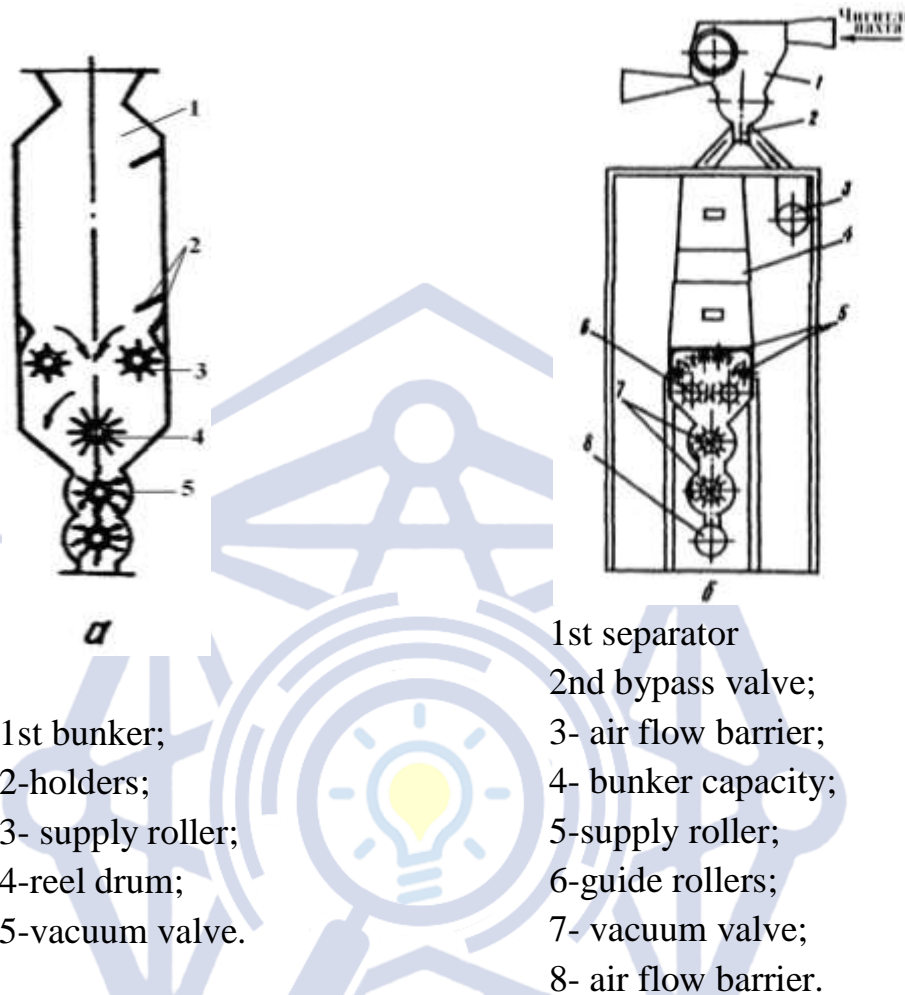


Figure 1. (a, b). Scheme of the automatic hopper feeder.

The automatic bunker feeder mainly consists of two parts found: from the lower and upper parts:

The bottom part is the main part, 6 plate transfer drum diameter of 270 mm adjustment from 1.14 to 11 rpm, the pile carrier drum is installed under the transfer drum, and the performance is automatically adjusted by changing the number of revolutions of the transfer drums.

A hopper is installed in the upper part and serves to collect cotton material in a certain volume.

Table 1. Technical and technological indicator



T/r	Indicator	Automatic bunker repairer
1	The rotational speed of the supply roller, rev/min	1,14÷11,6
2	Diameter of the supply shaft, mm.	254
3	The distance between the supply rollers, mm.	100
4	Cross-section of the supplier, mm.	508x1824
5	Maximum filling of the bunker, m <sup>3</sup> .	2,8
6	The diameter of the grinding drum, mm.	400
	- Rotation speed, rpm/min.	410
	-vaccum-clapon, rpm/min.	460

Wet cotton raw material goes through a separator into an automatic control hopper, from where the work given from here passes through a productivity screening device and goes into an injection funnel. The flow of the drying agent, coming from the heat generator, moves from the funnel with raw cotton to the dryer passes through its chamber and enters the air chamber of the separator-cleaner due to the suction created by the fan. The drying agent separated from the cotton raw material is released into the atmosphere, and the cotton is cleaned of small impurities and enters the injection funnel from here, and then the cotton raw material is transported to the second drying equipment.

### Conclusion

Improving moisture content determination and technology in tower drying drums for seeded cotton is essential for optimizing processing efficiency and product quality. By integrating advanced moisture sensors, leveraging data analytics, and refining drying technology, significant enhancements can be achieved in accuracy, reliability, and energy efficiency. This research contributes to advancements in cotton processing technology, offering practical solutions to overcome challenges and improve the performance of tower drying drums in the cotton industry.

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