

ISSN 2181-8622

Manufacturing technology problems



Scientific and Technical Journal Namangan Institute of Engineering and Technology

INDEX  COPERNICUS
I N T E R N A T I O N A L

**Volume 9
Issue 4
2024**



DETERMINATION OF SEED DAMAGE IN THE PNEUMATIC TRANSPORT SYSTEM BY CONDUCTING EXPERIMENTS

BOLTABAYEV BEKZOD

Deputy dean for academic affairs of Namangan Institute of Engineering and Technology, Namangan, Uzbekistan
Phone.: (0893) 735-7969, E-mail.: b.boltabayev89@gmail.com

Abstract: In this article, a number of proposals for improving the process of transporting cotton by pneumatic vehicle are given. Research is primarily aimed at maintaining the quality of transported cotton, reducing seed damage. It was determined that the level of mechanical damage to the seed is reduced by fixing rubber to the bent working parts of the pneumopipe, which can affect the cotton raw material.

Keywords: raw cotton, pneumatic conveying, mass, fiber grade, device, adjustment, hopper, strain gauge, deformable.

Introduction. The quality of the products of the cotton ginning industry depends on many factors in the technological process of processing raw cotton, including its pneumatic transportation. When moving through pneumatic pipes, cotton raw material is repeatedly hit by turning corners of the pneumatic transport system, and its movement speed decreases. At the same time, the cotton hits the walls of the pipe and a part of the seed is damaged, resulting in mechanical defects.

The purpose of this study is to determine the damage of cotton seed during pneumatic transportation. In the experiments, Namangan-77 1st grade selection cotton with a moisture content of 8% in standard atmospheric conditions was used.



Photo/Figure 1. An experimental device for monitoring the parameters of factors affecting damage to cotton raw materials

1. Fan, 2. Cotton drop, 3. Control panel, 4. 5. Speed buttons, 6. Angle control button.

Methodology & empirical analysis. Experiments were carried out in a special laboratory device, where the movement of raw cotton at the turning point of the pneumatic pipeline was studied.



Photo/Figure 2. Control panel of the experimental device

1. Screen, 2. Required 45, 67.5, 90 angle changing buttons, 3. Alarm button, 4. Time control button, 5. Speed and force determining button, 6. Elastic and plastic material selection button.

An alarm button is installed at a distance of 1-1.5 m from the place of cotton raw materials, it is possible to choose the most optimal value by studying whether it hits the diverter and conducting experiments at different angles.

The cotton material alternately hits the elbows or bends of the pneumatic pipe, and mechanical damage is observed. As a result, seed damage was determined using standard methods. The experiments were carried out at an air speed of 20-28 m/s.

Results. In order to determine the degree of impact on seed damage at the angle of impact of cotton with the guide, the guide was installed at an angle of 900. In the experimental device, the location angle of the router is 45; 67.5 and 900 are also available.

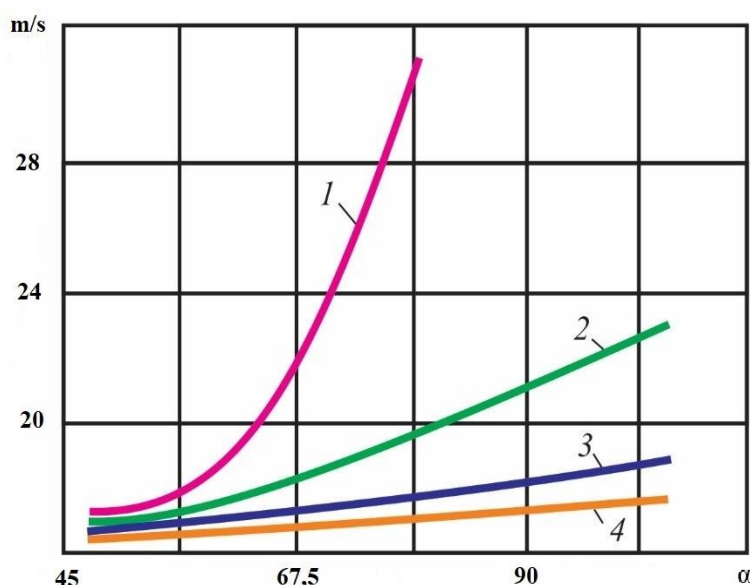
The higher the speed of transportation and, accordingly, the greater the impact force of cotton on the walls of the pneumatic pipeline, the greater the damage to the seeds. Experimental data agree well with practice.

The results in the experimental device show that the damage to the seeds increases as the contact angle between the cracks and the pipeline wall increases. However, at a speed of 20 m/s and an angle of impact of 450, this indicator is slightly reduced. In the experiments, this is explained by the increase in damage to cotton when the angle of contact of air currents with the guide is equal to 900, which has a negative effect on the storage of natural properties of cotton.

In order to determine the effect of the surface material on which the cotton material is hit on the damage to the seeds, experiments were carried out by attaching steel, aluminum or rubber material to the guide. A study of seed damage using rubber-coated guides showed a reduction in damage when conducted at the highest air velocity studied, approximately 20-28 m/s.

The damage of the seeds when hitting the rubber surface gave a much better positive result than the other materials (at an angle of 450).

Therefore, the pneumatic pipe lines should be manufactured in such a way that the angle of impact of the cotton with the pneumatic pipe wall during transportation is minimal. The impact corners of the pipeline on the elbows are covered with rubber, which has a positive effect on preserving the natural properties of cotton.



Photo/Figure 3. 1-steel 3 mm, 2-aluminum 3 mm, 3, 4-rubber thickness 4 and 5 mm

Conclusions. The degree of damage to the seed depends on the angle of contact of the raw cotton seed with the surface of the pipeline. Here, experiments were conducted with 3 different materials, thicknesses, and air speeds of 20, 24, and 28 m/s, and a graph is presented.

REFERENCES

1. Mamatqulov O., Muradov R., Saloxiddinova M Separating small impurities and heavy compounds using the cotton separator. XV International Scientific Conference "Actual Scientific Research in the Modern World". Pereyaslav-Khmelnytsky. Ukraine. 2016 year.
2. Mc. Cascill. O.L., Baker R.V. and Stedronsky V.L. Fans and Piping. In cotton Ginners Handbook. // U.S. Department of Agriculture, Agricultural Hand- book 503. 1977 y. 57-67pp.
3. U.S. Screw Conveyor Corporation. Screw conveyor catalog and engineering manual, // Screw Conveyor Corporation. Hammond. 1987. № 787. 64 pp.
4. Wright. T.E. Separators and droppers. In Cotton Ginners Handbook, U.S. Department of Agriculture. Agricultural Handbook 503. 1977y. 53- 56. pp.
5. Olimjon Sarimsakov, Rustam Muradov and Sadi Khusanov. The ways to improve the air transportation of raw cotton// World Journal of Engineering and Technology 2016 y. 125-130 pp. <http://www.scirp.org/journal/wjet>

6. <http://www.cotlook.com> - Cotton Outlook журналининг махсус сайти.
7. Burkhanov. A. Improvement of the working elements of the pneumatic transport system in order to preserve the natural properties of the processed cotton seeds. - Diss ... Cand. Tech. sciences. - Tashkent, 1987.
8. Amirov R. Investigations of the influence of mechanization means and pneumatic transport installations on the quality of fiber: Diss ... Candidate of Technical Sciences- Tashkent, TITLP, 1976-178p.
9. Azizkhodzhaev U.Kh. Influence of the distance of transportation of raw cotton with the help of transshipment units on the yield and quality of the fiber and the established norms of waste: -T.: 1968, 11c-report. TSNIKHPROM, No. 2.
10. Davidboev Kh.K. The main directions of technical progress in the cotton ginning industry. -M.: Light industry, 1977.-27 p.
11. Kuznetsova G. Investigation of damage to raw cotton seeds during harvesting with spindle machines // Selkhoz mashina.-Tashkent. 1939. No. 12.-C.11-12.
12. Akhmedkhodzhaev Kh. T. Research of transportation of raw cotton in metal-polymer pipelines and their influence on the quality of fiber and seeds. - Diss. ... Cand. tech. Sciences. - Tashkent, 1980.
13. Samandarov S.A., Liebster S.A., Pashkin V.G. Influence of pneumatic transport on the formation of fibrous defects in fine-fiber cotton. "Cotton Industry", 1979, no. 4, art. 10-11.
14. J. Jabborov G., Otametov TU, Khamidov AH.. Technology of processing of seed cotton. - Tashkent: Teacher, 1987. Pages 98-100.
15. Muradov. R. Construction of separators separating cotton from air flow during processing. UzNIINTI, Tashkent, 1992.
16. Muradov R. Fundamentals of increasing the efficiency of the transport process in the technology of primary processing of cotton. Tex.. fan. doct. ... Diss. Tashkent, 2006.
17. Fayziev R.R., Azimov Kh.O. Investigation of seed damage during pneumatic transportation of raw cotton // Cotton industry. -Tashkent. 1978. No. 2. -S.6-7.
18. Azbadalov. R. Study of ways to reduce damage to cotton seeds in pneumatic transport equipment at Gulbog-Tola JSC. -Master acad. to obtain the degree of diss.- Namangan, 2003.
19. Shodiev Z.O. Creating a system of equal distribution of cotton flow in the SX separator. Tex.fan. candidate. Diss. Tashkent, 2010.

CONTENTS

PRIMARY PROCESSING OF COTTON, TEXTILE AND LIGHT INDUSTRY

Korabayev Sh.	3
From street traffic to space: innovations in autonomous vehicles	
Egamov N.	10
Investigation of vertical forced vibration in the longitudinal - vertical plane of a binder that softens the crush between cotton rows	
Khamraeva S., Kadirova D., Davlatov B.	15
Determination of alternative technological factors for the production of functional fabric with a complex structure	
Khamraeva S., Kadirova D., Daminov A.	21
Designing fabrics for a given stretchability	
Kuliyev T., Rozmetov R., Tuychiev T., Sharipov Kh.	28
The effect of the angle of heat agent supply to the drying - cleaning equipment on cotton quality and cleaning efficiency of the equipment	
Abdujabbarov M., Alieva D., Karimov R.	35
Determination of the influence of the length of the tested yarn samples on their mechanical characteristics	
Jurayeva M., Nabidjonova N.	41
Research on physical and mechanical properties of fabric selected for special clothing of preschool children	
Yangiboev R., Allakulov B., Gulmirzayeva S.	45
Studying the alternative technological factors of the loom in the production of textiles based on basalt yarn	
Ganikhanov Kh., Mavlyanov A., Abdusamatov A., Mirzaumidov A.	55
Analysis of the maintenance parameters of the condenser	
Mavlyanov A., Mirzaumidov A.	60
The scientific basis of the lightened shaft	
Elmanov A., Mirzaumidov A.	69
Modeling of laser processing of thin-walled steel gears	
Nurillaeva Kh., Mirzaumidov A.	77
Cotton cleaner with multifaceted grates	
Ganikhanov Kh., Mavlyanov A., Abdusamatov A., Mirzaumidov A.	83
The equation of motion of cotton fiber in the condenser	
Khuramova Kh., Xoshimxojaev M.	89
Progressive method of cotton regeneration	

Abdulkarimova M., Lutfullaev R., Usmanova N., Mahsudov Sh.	94
Evaluation of aestheticity of women's dress models based on deep learning models	

GROWING, STORAGE, PROCESSING AND AGRICULTURAL PRODUCTS AND FOOD TECHNOLOGIES

Zufarov O., Isroilova Sh., Yulchiev A., Serkayev K.	101
Theoretical aspects of obtaining oxidation-stable vegetable oils	
Toshboyeva S., Dadamirzaev M.	110
Filling sauces for canned fish and their layer kinetics	
Atamirzaeva S., Saribaeva D., Kayumova A.	115
Prospects for the use of rose hips in food technology	
Turgunpolatova Sh.	121
Study of the quality of fruit pastela products	
Sultanov S.	126
Analysis of experiments on the process of deodorization of vegetable oil using floating nozzles	
Adashev B.	132
Physical-chemical analysis of oil taken from seeds of safflower	
Ismailov M.	137
Influence of surface layer thickness on hydraulic resistance of the device	
Khurmamatov A., Boyturayev S., Shomansurov F.	142
Detailed analysis of the physicochemical characteristics of distillate fractions	
Madaminova Z., Khamdamov A., Xudayberdiyev A.	154
Preparing peach seed for oil extraction and improving oil extraction through pressing	
Aripova K.	162
Methods of concentration of fruit juices and their analysis	
Djuraev Kh., Urinov Sh.	168
Theoretical and experimental study of the crack formation device in the shell of apricot kernels	

CHEMICAL TECHNOLOGIES

Urinboeva M., Abdikamalova A., Ergashev O., Eshmetov I., Ismadiyarov A.	175
Study of the composition and main characteristics of petroleum oils and their emulsions	
Tursunqulov J., Kutlimurotova N.	182
Application of 1-(2-hydroxy-1-naphthoazo)-2-naphthol-4-sulfo acid in amperometric determination of scandium ion	
Kucharov A.	191

Development of coal enrichment and gas extraction technology for the use of construction materials industrial enterprises	
Abdulkhaev T., Mukhammadjonov M., Mirzarakhimova F.	
Isotherm of benzene adsorption and differential heat of adsorption on AgZSM-5 zeolite	198
Vladimir L., Eshbaeva U., M.Ergashev	
Innovative environmental packaging for separating storage of two components, allowing to extend the lifetime without preservatives	204
Kodirov O., Ergashev O.	
Energetics of adsorption of water molecules to aerosol	212
Yusupov K., Erkabaev F., Ergashev D., Rakhimov U., Numonov M.	
Synthesis of melamine-formaldehyde resins modified with n-butanol	219
Ergashev O., Abdikamalova A., Bakhronov Kh., Askarova D., Xudoyberdiyev N., Mekhmonkhonov M., Xolikov K.	
Thermodynamics of Congo red dye adsorption processes on mineral and carbon adsorbents	228
Ergashev O., Maxmudov I.	
Water vapor adsorption isotherm in zeolites regenerated by microwave thermoxidation method	235
Jumaeva D., Zaripbaev K., Maxmudov F.	
The elements and oxide content of the chemical composition of the feldspar	242
MECHANICS AND ENGINEERING	
Khudoyberdiev U., Izzatillaev J.	
Analysis of research on small wind energy devices	249
Atajonova S.	
Mathematical model of system analysis of technological processes in the form of key principles for effective decision-making	258
Kuchkarbayev R.	
Mathematical modeling of heat transfer through single-layer and multi-layer cylindrical walls in buildings and structures	264
Atambaev D.	
Difference in the length of individual yarn composition of twisted mixed yarn and comparative analysis of single-thread elongation deformations	269
Abdullayev S.	
Modeling the functionalities of an automated system for managing movement in the air	276
Turakulov A.	
Describing computational domains in applications for solving three-dimensional problems of technological processes	285
Mamaxonov A.	

Mathematical model of machine aggregate of tillage equipment process	293
Khudayberdiyev A.	
Technical and economic aspects of processing pyrolysis distillate into motor fuel	304
Abdurahmonov J.	
Research results on the selection of the mesh surface of a lint-cleaning device	311
Vohidov M.	
Development of a program for determining eccentricity by analyzing the magnetic field in the air gap of an asynchronous motor	319
Utaev S., Turaev A.	
Analysis of methods and prospects for application of optical methods for control of working surfaces of cylinder liners of internal combustion engines	327
Boltabayev B.	
Determination of seed damage in the pneumatic transport system by conducting experiments	335
Azizov Sh., Usmanov O.	
Simulation of equation of motion of the new construction gin machine	339
Sharibaev N., Homidov K.	
Theoretical analysis of the coefficient of friction induced by the pressure force of a vertical rope acting from above and below	347
Aliyev B., Shamshidinov M.	
Improvement of the linter machine and development of its working scheme	356
Mukhametshina E.	
Analysis of cotton flow behavior in different pneumatic pipes	362
Yangiboev R., Allakulov B.	
Obtaining and analyzing correlational mathematical models of the sizing process	369
Mirzakarimov M.	
Efficient separation of fibers from saw teeth in the newly designed gin machine	379
Azambayev M.	
Measures to improve the quality of fluff	387
Abdullayev R.	
Scientific innovative development of cotton gining	392
Kholmiraev F.	
Air flow control factors in pneumatic transport device	397
Sharibaev N., Makhmudov A.	
Separation of cotton from airflow in pneumatic transport systems of the cotton industry	404
Sharibaev N., Mirzabaev B.	

Effect of steam temperature on yarn moisture regulation in textile industry	410
Sultanov S., Salomova M., Mamatkulov O.	
Increasing the useful surface of the mesh surface	415
Muhammedova M.	
Kinematics of the foot in a healthy person's foot and ankle injury	421
ADVANCED PEDAGOGICAL TECHNOLOGIES IN EDUCATION	
Abdullayev H.	429
Algorithm for creating structured diagrams of automatic control systems	
Kodirov D., Ikromjonova N.	437
On delayed technological objects and their characteristics	
Uzokov F.	444
Graphing circles, parabolas, and hyperbolas using second-order linear equations in excel	
ECONOMICAL SCIENCES	
Zulfikarova D.	449
Issues of developing women's entrepreneurship	
Ergashev U., Djurabaev O.	455
Methods for assessing the effectiveness of waste recycling business activities in the environmental sector	