EFFECT OF MUTUAL FRACTION OF SEPARATOR WORKING PARTS ON COTTON RAW MATERIALS

Nabijanov Mirzabek
Anvar Maxkamov
Shokhsanam Imomalieva
Namangan Engineering Technology Institute, PhD student Email: mirzabeknabijanov1@gmail.com
ORCID: 0009-0003-4996-6121 Phone : +998941578797

Abstract: *In this article, as a result of the mutual friction of the details in the separation system, the effect on the quality indicator of cotton raw material and the process of separating the air from the air convey is theoretically analyzed. Ways to reduce fiber and seed damage and defects in the working chamber have been studied.*

Key words: *Friction, elasticity, seed, working chamber, brittleness, deformation, coefficient, lubrication, energy consumption, corrosion.*

Аннотация. *В данной статье теоретически проанализировано влияние взаимного трения деталей в системе сепарации на качественный показатель хлопкового сырья и процесс сепарации воздуха из воздухопровода. Изучены пути снижения повреждений и дефектов волокон и семян в рабочей камере.*

Ключевые слова: *Трение, упругость, семена, рабочая камера, хрупкость, деформация, коэффициент, смазка, энергозатраты, коррозия.*

INTRODUCTION

The results obtained through tribological studies of separator working parts are usually carried out to ensure their efficiency and long-term reliability. Friction is a state of resistance between two surfaces when they interact with each other, which occurs between the working parts of the separator (e.g., rollers, gears, drums). As a result of tribological studies of the separator working part, we found that friction can lead to an increase in temperature, material wear, and energy loss.

Each part is inextricably linked to the cotton raw material and affects its quality indicators, improving or deteriorating it. During friction, working parts, such as rollers and gears, are quickly worn out, which leads to a decrease in their efficiency. (1) Increased friction slows down the cotton separation process and leads to loosening.

The details of the working part, due to high friction, cause an increase in temperature and deformation of the materials, which can quickly lead to failure of the separator parts.

Scientific research methods. Tribological analysis helps to study the wear process occurring in the separator parts. The working parts of the separator, such as valves, rollers, gears and other important elements, should have a low wear coefficient. Such tests help to study the interactions between materials (for example, metal surfaces to plastic surfaces) and are used in the selection of suitable materials. To reduce friction, it is necessary to constantly lubricate the working parts of the separator. (2) The correct lubrication system makes the process efficient, reduces wear and, most importantly, ensures that the internal parts work in good condition for a long time.

At the same time, the working parts of the separator should be made of high-quality, friction-resistant materials. Special alloys or ceramic materials can be used. Tribological studies study the friction properties of the treated surfaces and determine their optimal friction coefficient. Less friction reduces energy consumption and extends the service life of parts. Optimizing the operating conditions (speed, temperature) of the separator system reduces friction and ensures long-term operation of components. It is necessary to introduce modern measurement systems to monitor and control friction. These systems help to determine friction and high temperatures in the working parts of the separator, making it possible to detect malfunctions in advance. (3)

Results. An effective lubrication system is important to ensure long-term operation of the working parts of the separators. Tribological studies helped to assess the effectiveness of the thickness, type of oil and coating materials. By using the right lubrication system, we were able to reduce friction and slow down wear processes. We proved that the temperature of the working parts of the separator affects the tribological properties, especially wear and friction coefficient. (4) Tribological studies have helped to determine the performance of working parts under different temperature conditions. This has been of great importance, for example, in analyzing how the separator changes when operating at high temperatures and the resistance of the material. The problem of corrosion in separator parts is also evaluated in tribological studies. Since wear and corrosion often occur together, this has a negative impact on the overall reliability of the separator. (5)

Discussion. Through tribological studies, we have studied the corrosion resistance of a material and how this process is related to friction and wear, and have found solutions to the problem in several ways. By coating or treating the working parts of the separator with special materials, we have ensured their long-term operation. Tribological analyses have helped us evaluate the friction and wear resistance of coating materials, which has led to the optimization of material selection and technological processes. Tribological studies have helped us identify potential failures and deterioration of separator parts under long-term operating conditions. Through tests, we have predicted the service life of the parts, as

well as identified preventive measures to prevent uncertainties and unexpected damage. (6) (7)

Conclusion. Tribological studies are very important for ensuring the efficient and reliable operation of the separator working parts. Through this process, it is possible to analyze aspects such as wear, friction, lubrication, temperature, and corrosion resistance of the parts. As a result, it is possible to extend the service life of separators and increase energy efficiency.

The effect of mutual friction of the working parts of the separator can reduce the efficiency of the separator and lead to rapid wear of the parts.

To reduce friction, it is necessary to lubricate, use high-quality materials, optimize operating conditions and apply modern monitoring systems. Compliance with these measures will ensure the long-term efficient operation of the separator.

REFERENCES:

1. Mahkamov A. Tribology in sheet metal forming : дис. – Universidade do Porto (Portugal), 2017.
2. Makhkamov, Anvar, et al. "Tribology testing to friction determination in sheet metal forming processes." Ciência & Tecnologia dos Materiais 29.1 (2017): e249-e253.
3. Makhkamov, Anvar. "Determination of the friction coefficient in the flat strip drawing test." Engineering 13.11 (2021): 595-604.
4. Абдувахидов, Мубаширхон, et al. "Исследование вопросов аналитического определения параметров жесткости пакетных конструкций." Universum: технические науки 4 (61) (2019): 16-19.
5. Хусанов, Сади Маҳаматжонович, et al. "Математическое моделирование отделения хлопка-сырца от воздушного потока под действием центробежной силы." Universum: технические науки 5-2 (74) (2020): 15-20.
6. Imomalieva, Shokhsanam, and Anvar Makhkamov. "Study of the Aerodynamic Process and Its Impact on Cotton Transportation Process through the Cotton Pipeline." Engineering 13.12 (2021): 667-676.
7. Egamberdiyevich, Boltabaev Bekzod, et al. "Causes of damage to the raw cotton in the pneumatic transport system and ways to reduce it." ACADEMICIA: An International Multidisciplinary Research Journal 11.5 (2021): 1097-1102.
8. Mirzabek, Nabijanov. "CAUSES OF BELT EROSION OF BELT CONVEYORS." Новости образования: исследование в XXI веке 1.3 (2022): 835-836.
9. Mirzabek, Nabijanov. "LAWS AND THEORIES OF FRICTION." Новости образования: исследование в XXI веке 1.3 (2022): 837-839.

10. Mirzabek, Nabijanov. "COPPER-BASED ALLOYS WITH OPTIMIZED HARDNESS AND HIGH CONDUCTIVITY." Новости образования: исследование в XXI веке 1.3 (2022): 829-831.

11. Mirzabek, Nabijanov. "INTERNAL FRICTION IN LIQUIDS." Новости образования: исследование в XXI веке 1.3 (2022): 832-834.