

 Research Article

## METHODS OF INCREASING THE DURATION OF THE BELT, WHICH IS THE MAIN BODY OF BELT CONVEYORS

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### ABSTRACT

In this article, recommendations for ensuring the long-term operation of the belt conveyor belt.

### KEYWORDS

Conveyor, belt, abrasive, friction, decay, rivet nail, vulcanization, rollers.

### INTRODUCTION

Belt conveyors are widely used in the chemical industry and construction materials production enterprises. Depending on several factors such as the size of the transported load, belt tension, speed, and friction generated during the work process, the belt, which is the main working part of the conveyor, becomes unusable before the deadline [1-4]. The moving working part (tape) slides on the support surface that holds it, and the

fallen pieces of scattered loads transported to these surfaces take part in the friction process and form an abrasive environment. As a result, as a result of the abrasive friction between the surfaces of the tape and the support rollers, the tape bends and microcracks appear in the tape [5-9].

The main part



Abrasive wear, i.e., wears caused by the friction of the transported raw material with the tape, over time, micro-cracks cause the failure of the tapes.

Abrasiveness means that the load transported in the work process erodes the surfaces of the equipment in contact with it [10-14].

Table 1. Groups of scattered loads by particle size

<b>The name of the group</b>	<b>The largest dimensions of pieces (mm)</b>
<b>A separate large piece</b>	<b>up to 500</b>
<b>Large piece</b>	<b>500</b>
<b>Medium piece</b>	<b>350</b>
<b>Small pieces</b>	<b>80</b>
<b>Granular lumpy</b>	<b>6</b>
<b>Powdery</b>	<b>0.5</b>
<b>Dusty</b>	<b>less than a</b>

Loads are divided into 4 groups according to the level of abrasiveness: A - non-abrasive, V - low abrasive, C - medium abrasive, and D - high abrasive. Coke, coke, agglomerate, and recycled agglomerate are highly abrasive. Quartz sand, ferrous and non-ferrous metal ores and their concentrates have low abrasiveness. The presence of large links of limestone in agglomerate is a factor determining its chemical aggressiveness. In conveyors transporting such loads, roller supports and metal structures wear significantly faster [13-15]. The moisture content of 4-6% of cargo reduces dust generation during transportation. Increased humidity reduces the spreadability of the load and clogs the funnel part of the loaders. The stability of the load is characterized by the coefficient of stability.

(1)

here: - strength limit of the sample under a compression load, (MPa).

Clumping is the loss of mobility of loose (clay, salt, cement) loads during long-term storage.

Viscosity is the ability to change loose loads (clay, boron) into solids (especially in wet conditions).

A description of the most common scattered loads is given in Appendix 1.

Currently, the production enterprise, the method of connecting with rivets is used in the repair of bent or broken tapes.

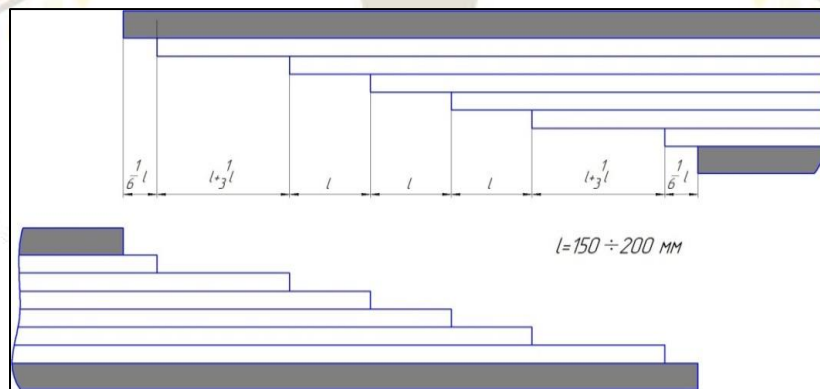


**Figure 1. Rivet nail method**

In this method, the connecting parts of the tape are fastened to each other with superimposed rods. This causes raw materials to spill as a result of shaking of the tape when the rivet nails collide with the roller and drum surfaces when the conveyor moves, and accelerates the bending of the rivet nail, rollers and drum surfaces. As a result, the service life of the conveyor is reduced.

In order to increase the service life of belt conveyors and other working parts that wear out due to friction, it is advisable to use the method of restoring broken tapes.

As a result of vulcanization, it is glued with raw rubber layer by layer after heating. It is cut and prepared as shown in Fig.



**Figure 2. Vulcanization method**

The two ends of the connecting tape and the two ends of the patch tape are cut in accordance with each other as shown in the picture. Each surface is vulcanized with specially produced adhesives for patching cord materials.

The tape repaired in this way increases the life of the tape, and also increases the life of the rollers and drums.

Belt conveyors require constant monitoring of belt tension and working conditions, with particular attention to belt connections.

In order to ensure the long-term operation of the tape, it is necessary to ensure the following:

- a) load the transported goods only after the movement of the tape is stabilized;
- b) stop the transported cargo only after it is completely filled with tape material;
- c) elimination of the possibility of mineral oils entering the tape;
- d) to monitor the wear of the rubber tape passing through the load-cleaning shovels (the tape is not squeezed by the shovels with a metal body);
- e) timely replacement of non-rotating support rollers;
- f) making timely decisions to prevent the tape from moving to different sides during movement.

The movement of the tape in different directions is caused by factors such as skewing of the

tensioning drum, installation in the wrong position or the error of locking in relation to the central axis, the incorrect connection of the ends of the tape, the appearance of separations in the seams and layers of the tape along one side of the drum.

## CONCLUSION

As a temporary measure to prevent the tape from moving in different directions, it is recommended to install several support rollers on the wrong side of the tape that deviates from its direction. Usually, self-aligning support rollers in such transport devices are the means to eliminate the errors of the transverse movement of the tape.

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