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COMPARISON OF TRIBOLIC PROPERTIES OF SELECTED NON METAL MATERIALS SUITABLE FOR PRODUCTION OF THE CARIRER PLATES FOR BULK CONVEYERS (a short communication)*

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A b s t r a c t. The results of tribolic properties of non-metal materials hard wood (beech), Teflon, Werkstoff"S", Alkamid are introduced in the study. The obtained experimental values reached on a tribometer with shift movement reveal the excellent sliding properties of Werkstoff"S" material at low wear. This material is of exceptional health characteristics and makes possible recycling of the waste which develops during chip working. Shearing friction coefficient is comparable with that of Teflon.

K e y w o r d s: tribolic properties, metal materials, bulk conveyers

INTRODUCTION

Constructing new food and agricultural plants we often include requirements for using materials safe from the ecological point of view. In this situation are often used parts made of plastics. These materials must fulfill the requirements of rigidity, must be health safe enable recycling and be ecologically safe. Futher very important properties are for example the tribolic properties. Very important among these are mainly small wear and low value of coefficient of friction. The use of such materials will result in lower mechanical power and power input.

One of the examples of practical results of the research work solving reduction of mechanical power and noise of bulk conveyer, which is used for corn manipulation was the proposal of using new construction materials made of plastics. The other result of the research was also analysis of the losses which arise during manipulation with the material and running of the mechanical parts of the coveyor.

MATERIAL AND METHODS

As a result of theoretical analysis there was found that the largest proportion of the losses arose during the shear of transported material along the bottom sliding plate and side plates of the conveyor. The proportion of the losses that depend on carrier plates (Fig. 1) is about 10%. Consequently the value of the coeficients of friction of selected couples of materials were measured and then the materials with the best tribolic properties were selected.

The measuring of the coefficient of friction for selected couples of materials were made on tribometer with advanced motion.

The loose material, in our case corn, was put into the testing body of the box shape and slided along the sliding plate. The best sliding properties have the following sliding materials:

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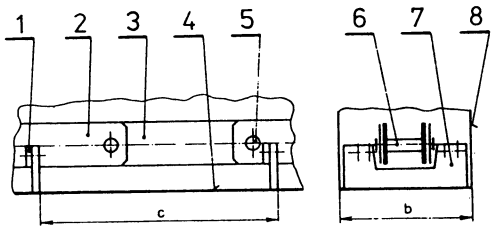

Fig. 1. 1 - catch, 2 - outer clip of the chain, 3 - inner clip of a chain, 4 - bottom sliding plate, 5 - pin, 6 - container, 7 - carrier plate, 8 - side plate.

Teflon, Device Werkstoff"S", Alkamid, hard beech wood. These values were gained for wheat with the moisture of 14 %.

The patterns of the solid materials suitable for the production of the carrier plates were fixed in the testing body according to Fig. 1, No. 3. Testing body was sheared along the sliding plate made of stainless sheet. As to sliding properties tested materials can be ordered from the best to the worst one like this: Teflon (f=0.09), Werkstoff „S" (f=0.12), Alkamid(f=0.18), hard wood beech(f=0.2).

CONCLUSIONS

The obtained results were used for the reconstruction of the conveyors in corn silos. Sliding plates of the conveyer which had previously been made of Alkamid were replaced by the plates made of Werkstoff.S. It was also proposed to put on the bottom and side plates of the conveyor a layer of material Fluepox. These improvements resulted in the lower power input of the conveyor.

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