

DEPENDENCE OF THE SCREW HARDNESS ON WEARING

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Анотація

Стаття присвячена позитивному впливу наплавлювальних матеріалів з високою твердістю на зносостійкість гвинта для виготовлення гранул, що експериментально доведено.

Ключові слова: пропан, бутан, густина, скраплений нафтовий газ, кількісний вміст компонентів.

Abstract

The article is devoted to the positive effect of surfacing materials with high hardness on the wearing resistance of the screw for making pellets which is proved experimentally.

Keywords: propane, butane, density, liquefied petroleum gas, the quantitative content of the components.

Introduction

Recently, there was a huge interest in the production of solid biofuels in the form of so-called pellets. This allows the industry to solve several issues immediately: it concerns the use of wood wastes as raw material for the production of pellets and the creation of alternative and environmentally friendly fuel. One of the main methods for obtaining pellets is screw extrusion, which is carried out by special press extruders. Since this method is characterized by high productivity and quality of products, its application is rational. However, there is a significant problem at this stage -the working body of the press extruder (screw) quickly wears out in the process of extrusion. Therefore, there is a need for increasing the wear resistance of the screw, which will increase the economic efficiency of the production of pellets by screw extrusion.

The Results of the Research

The research is devoted to the relationship between the hardness of the screw surface, and the amount of wearing which is investigated [1]. The experiment was carried out for these purposes, during which the wearing in a wood chip environment was subjected to the samples with hardness of the surface, respectively, 40 HRC (hardness of the surface of the screw) and 55 HRC, in the same conditions (under pressure of 0,14 MPa). On the basis of the data obtained during the experiment, the wear curves for the considered samples were plotted, as shown in Fig. 1 [2]. From Figure 1 it can be seen that with hardness of the surface of 55 HRC mass wearing is less than one with hardness of 40 HRC. That is, the wearing resistance of the sample, which has a higher hardness, is higher than that of a sample with less hardness under the same conditions of wearing.

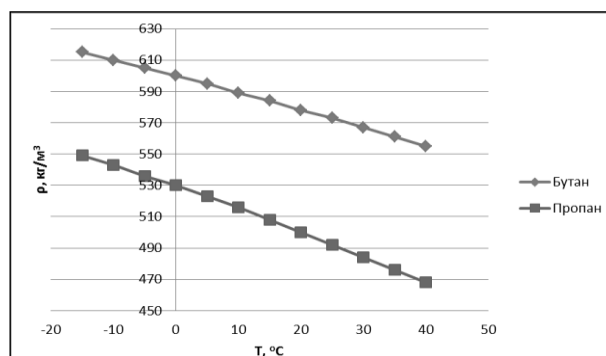


Figure 1. Wear curves (for hardness 40 and 55 HRC)

Conclusion

Summing it up, it can be concluded that in conditions of wearing that occurs during the extrusion of granules, increasing the stiffness of the surface of the screw can be achieved by increasing its wear resistance. This can be achieved by welding carbon coatings with impurity carbon materials and carbide scrap.

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