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BINDER FOR PELLET PRODUCTION

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SUMMARY

The poster presents binders for the production of biomass pellets are materials added during the pelleting process or natural ones contained in the plant biomass. Binders during agglomeration undergo specific physical and chemical changes that have a significant impact on the energy consumption of the pelleting process and the quality of the granulate.

INTRODUCTION

The binder may be a liquid a solid that forms a bridge, causing a reaction inducing a reinforced intermolecular bond. Substances such as lignin, protein, starch.

1. A review of natural binders contained in plant biomass and their impact on selected properties of pellets

Starch

Can also be used to reduce abrasion. A small amount of less than 2% by weight, increases the strength of the pellet. The most common starches are derived from potatoes and corn.

Lignin

Lignin acts as a binder mainly in feed material, although it can also be added as binder - obtained as a by-product of the pulp and paper industry. At elevated temperatures, it softens and supports the binding process. Addition above 34% reduces durability. Fiber increases the viscosity of the granulate and improves the pellet structure. Increasing the fiber addition from 18 - 27% increases the pellet durability by approx. 5%.

Increasing the fat content reduces the agglomerate compression resistance and changes the mechanical properties of the granulate. [1,2,3].

2. Review of additives of artificial binders to plant biomass and their influence on selected pellet properties

Modified wheat starch.

It is an adhesive used in the production of, among others pellets from fine coal and stone, straw pellets. The binder for the granulate requires only mixing with the raw material, light moisturizing, when the raw material is too dry). The addition of this binder favorably affects the structure of the granulate [5].

Lignosulphonate - is a by-product of the paper industry. It is produced in a chemical dissolution process and is a toxic liquid with a concentration of dissolved and / or suspended solids. This substance binds individual components in the mix, increasing the stability and quality of the agglomerates. Consequently, the obtained pellets are characterized by higher density and mechanical strength [6].

Calcium carbonate

The addition of calcium carbonate to plant biomass affects the significant increase in mechanical durability. The granulate produced with calcium carbonate was more resistant to compression and improved structure [7].

Borcet BRY-20[0 An adhesive based on modified starch used as a binder for the production of pellets from charcoal and hard coal [8].

Fig. 1. Plant biomass has a natural binder [4]

Fig.2. Modified pellet starch binder [5]

Fig. 3. Lignosulfonates binder for the production of pellets [6]

CONCLUSION

The pellet production uses additives that provide better binding. Binding sustances have been studied and used as a way to increase the quality and structure of pellets

The binders have a positive effect on the durability, strength and structure of the pellets, thus reducing the dust and particles formed during their transport and storage.

Binders increase production efficiency, reduce energy costs and improve the pelletizing effect.

LITERATURE

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