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Qobulova Nilufar Jalilovna, assistant of professor
Head of department

Abdurahmonov Abdurashid, assistant of professor
Andijan Machine Building Institute

Musaev Marufjon, assistant of professor

Mahkmudov Sherzodbek, master student
Tashkent State Technical University

**DEVELOPMENT OF SAFE TECHNOLOGY OF FUEL BRIQUETTES
BASED ON FOOD AND AGRICULTURAL ORGANIC WASTE**

Annotation: In this article highlights of development of safe technology of fuel briquettes based on food and agricultural organic waste. The conducted studies allow us to identify the best type and amount of binder, which generates new environmental problems.

Key words: technology burning, fuel briquette, food and agricultural organic waste, natural resources.

The problem of ecology is one of the most important problems of our time. Recently, due to the rapid change in the external environment on Earth under the influence of human activity, ecology has gained enormous popularity and has become the object of close attention of the most diverse segments of the population. The main components of this problem are the pollution of irreplaceable natural resources: air, water, soil by industrial and transport waste, which has led to the impoverishment of flora and fauna.

Currently, the technology of burning sawdust, wood chips, and old wood is being actively introduced. This process of direct use of sawmilling and woodworking waste has a number of disadvantages. Firstly, to increase the combustion efficiency, sawdust and wood chips must be dry, which requires additional technological processes. Secondly, the problem of warehousing needs to

be solved. In addition to the need for large storage areas, fresh sawdust and wood chips are prone to spontaneous ignition. Thirdly, small-fraction wood waste, due to their low bulk density, is unprofitable to transport over a distance. Some alternative to the direct use of wood waste in the form of fuel is the manufacture and use of briquettes. At the same time, the problems of increasing the calorific value of the fuel material and reducing the necessary storage space are solved. During storage, fuel briquettes do not self-ignite. The efficiency of boiler houses increases. The disadvantages of this type of fuel include the complexity of automating the process of loading briquettes into the furnace device.

Fuel briquettes and pellets from wood waste solve these problems.

It should be immediately clear that in our case we are talking not only about sawdust - woodworking waste, but also about all other numerous types of cellulose-containing raw materials, waste from crop production and processing industry.

In general, the task of producing efficient and environmentally friendly fuel from renewable and unused waste is very noble and grateful, solving the problems of recycling practically useless and often harmful waste, gives consumers an additional source of efficient fuel, is the subject of profitable business of manufacturers, giving them an additional good source of profit. Disposal of sawdust and woodworking waste and their briquetting is a delicate technological process that can turn your woodworking production into an environmentally friendly, waste-free, highly profitable business. Due to the growing needs of the population for energy resources and the reduction of natural resources, the use of new, alternative energy sources should provide your needs with greater efficiency and greater returns. For more than a decade, sawdust fuel briquettes have been a popular and more economical fuel and are used in many countries around the world.

Wood briquettes do not include any harmful substances, including adhesives. Specially pressed under high pressure and at high temperature, briquettes have the shape of a cylinder. Fuel briquettes are widely used and can be used for all types of

furnaces, central heating boilers, wood boilers, etc., they burn perfectly in fireplaces, stoves, grills, etc.

Briquetting of waste, utilization of sawdust of woodworking industries allows you to get an excellent source of energy without environmental pollution.

Fuel briquettes are pressed products made from dried wood residues, such as sawdust, shavings, wood chips, grinding dust, etc.

Fuel briquettes are an environmentally friendly product, since no additives are used in their production. This type of fuel has unique properties:

* High duration of gorenje (30 minutes) and smoldering (100 minutes) This means that compared to conventional firewood, laying in the oven can be done less than three times. Briquettes burn with a minimum amount of smoke, do not shoot, do not spark. After combustion, the briquettes turn into coal, like ordinary firewood and, in the future, it is possible to cook shish kebabs or a grill on them.

The calorific value of briquettes is greater than that of conventional firewood and is almost equal to the calorific value of coal.

When cooking kebabs or grilling, when fat gets on the coals of briquettes, they do not ignite, but continue to smolder or burn with a steady low flame.

The technology of production of wood fuel briquettes is based on the process of pressing finely ground wood waste (sawdust) under high pressure when heated, the binding element is lignin, which is contained in plant cells.

They are used as fuel: in houses, fireplaces, stoves, saunas, dachas and in other places where there are installations running on solid fuel.

Briquetting is a process during which the material is pressed under high pressure. When pressing under high pressure, the temperature of the material increases and the release of resinous binding substances occurs, due to which the material is glued and the further formation of the briquette is carried out. The minimum moisture content of the pressed material is 6%. The optimal moisture content of the briquetting material varies depending on the rock and the fraction of the latter, the optimal moisture content is from 6 to 16%.

Preparatory stage of production of fuel briquettes:

Wet sawdust or chips stored under a canopy are loaded into the hopper of the scraper conveyor 1 and fed to the indirect heating heat generator 2. Sawdust is used as fuel. An air duct 3 is connected to the heat generator, through which the heated air enters the dryer. From the same warehouse, raw materials are loaded into the hopper of a scraper conveyor 4 with a frequency controller and fed to a disk separator 5 for primary sorting. Large pieces are separated from the total mass and removed into a container 6.

If you have large waste, then you need to include a chopping machine 20 in the line, which processes the hump, veneer, large pieces into technological chips.

Drying of briquettes. The cleaned sawdust is fed into the receiving hopper 7 of the drum dryer 8, picked up by heated air coming through the duct 3. A mixture of air and sawdust enters the dryer 8, where intensive drying takes place.

Crushing of briquettes. Through the material pipeline, the dried sawdust enters the cyclone 9, from where it is discharged into the crusher 12, where it is further crushed. The exhaust air is released into the atmosphere by the fan 10.

Pressing briquettes. The material pipeline of the pneumatic transport 13 feeds the crushed raw materials into the container 15. There is an agitator inside the container that prevents the material from caking. Then the material is output to the press 16, where briquettes are formed.

Cooling of briquettes. Briquettes coming out of the press have a high temperature and are fragile. In order to give them the desired hardness, humidity and temperature, cooling is necessary. From the press, the briquettes fall into the cooler 17, where they are cooled and cleaned of small particles. An aspiration cyclone 18 is installed at the outlet of the cooler. It catches dust and fine particles.

Disposal of sawdust and woodworking waste and their briquetting is a delicate technological process that can turn your woodworking production into an environmentally friendly, waste-free, highly profitable business. In addition to the pleasure of the profit you will be warmed by the thought that you are helping to keep our planet clean.

Briquetting is a process during which the material is pressed under high pressure. When pressed under high pressure, the temperature of the material rises, and resinous binding substances are released, due to which the material is glued together and the further formation of the briquette is carried out. The minimum moisture content of the pressed material is 6%. The optimal moisture content of the briquetting material varies depending on the breed and fraction of the latter, but guided by experience, we can recommend a moisture content from 6% to 16%.

Thus, the equipment for waste disposal using braces allows:

- Purchase an excellent source of energy;
- Save space when storing waste and transporting it;
- Keep the environment clean;
- Make a profit from the sale of briquettes.

In general, the technological process of production of fuel briquettes (pellets) includes the following stages: grinding of raw materials to obtain the required fractionality, drying of crushed raw materials, granulation, cooling of granules.

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