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USE OF FLY ASH FROM POWER PLANTS IN INDUSTRY

The idea is to efficiently use fly ash, which considers as wastes of fuel burning, in industry to increase profitability and ecology.

This work deals with the use of fly ash from power plants in industry. Scientists need to focus equal attention on theories of the environmentally friendly building elements based on fly ash, on descriptions of the utilization and transportation process as well as for more immediately relevant ideas about how fly ash can be efficiently used.

The goal is to find the best ways of using Power Plants wastes.

Power industry is based on conventional fuels combustion: hard coal and brown coal. Power generation process creates considerable quantity of wastes, including fly ash which is used in various other industries. One method of using fly ash is placing it in a fly ash – water suspensions in underground coal mines. Fly ash in a mixture with water might be used for carbon dioxide fixation in mineral carbonation process.

Due to significant amount of power and heat and power plants existing, ipso facto significant amount of produced fly ashes, which could be used in industry.

Fly ashes have many economic applications. They are mainly used in the building materials industry for cement, concrete, light aggregate and building ceramics production (Fig. 1). One of the most important directions in ash utilization is its use in road building and geotechnics. Typical world practice is fly ash utilization in underground mining. As the data shows, the largest quantity of fly ashes was economically used in mining (maximum 60.7% of total fly ash utilization). The fact that coal mines located near power plants or combined heat and power plants favour the fly ash use in the mining industry. Coal mines can utilize ash during entire year while cement plants are of seasonal operation. An important aspect of fly ash utilization in mines is capability to use ashes of various chemical composition. [1]

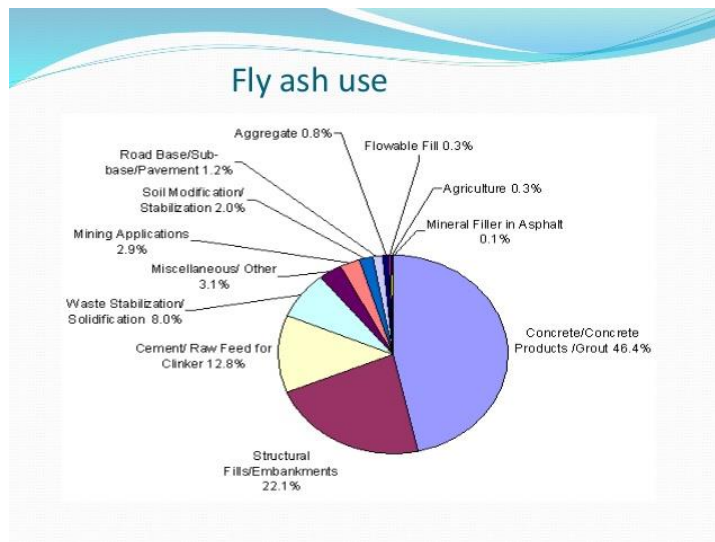


Fig. 1 Fly ash use and utilization [2]

For further research it is offered to take into account that the disposal distinguishes the following fly ashes' types:

- fly ashes from carbon – code 10 01 02;
- fly ashes from peat and wood which was not chemically processed – code 10 01 03;
- fly ashes and dusts from liquid fuels boilers – code 10 01 04;
- fly ashes from emulsified hydrocarbons uses as fuel – code 10 01 13;
- fly ashes from co-combustion which contain hazardous substances – code 10 01 16;
- fly ashes from co-combustion other than specified in 10 01 16 – code 10 01 17;
- fly ashes and solid wastes' mixtures from calcium methods for flue gas desulphurization (dry and half dry flue gas desulphurization and combustion in fluidized bed) – code 10 01 82.

For more complete analysis of fly ash it is defined as a residue after coal or brown coal combustion, which is lifted together with flue gases. The standard defines also captured and emitted fly ashes. Captured fly ash is a fly ash captured outside the furnace chamber. Emitted fly ash is fly ash lifted with flue gases outside chimney. Standard distinguished two types of fly ashes:

- fly ash from hard coal (PK symbol);
- fly ash from brown coal (PB symbol).

It has to be stressed that fly ashes' properties depend on many factors, including type of combusted carbon, fuel combustion technology, fluid chemical composition. One of the most important aspect of using ash is considered to be based on water mixtures for carbon dioxide fixation as the possibility of storing it in underground mines. The technology of placing fly ashes as mixtures with water has been in use for years.

Summing up, it was found that fly ash can be used in building industry to lower expenses. Also fly ash was revealed as a good agent for carbon dioxide

fixation as the possibility of storing it in underground mines in combination with water mixtures.

REFERENCES

1. A. Uliasz-Bochenczyk and E. Mokrzycki Fly ashes from Polish Power Plants and combined Heat and Power Plants and conditions of their applicatin for carbon dioxide utilization / Trans IChemE, Part A, September 2006 [c. 2].

2. <https://www.slideshare.net/JyotiKumari70/flyash-disposal-and-utilization-69528633>.