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ANALYSIS OF POLLUTION CONTROL EQUIPMENT FOR THE DUST REMOVAL FROM FEED MILLS

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In the production of animal feed, factories mostly use only natural ingredients, which by their nature do not harm either the production or its employees. It seems that the preparation and processing stages of raw materials cannot be harmful, but then there is the issue of waste, most often small parts of raw materials and dust, which, without the necessary protective equipment, in large or even small quantities can be harmful to those working indoors, causing irritation of the mucous membrane or, in the worst case, lung disease, and dust emissions can be explosive under certain conditions. Dust and gas cleaning units or gas cleaning units are equipment for dust protection. The plants are the complex of structures designed to remove, transport and capture pollutants from the gas and dust stream discharged from the equipment. They include: cyclones, aspiration and pneumatic transport. Cyclones and fabric filters are most effective in feed production [1].

Cyclones for grain dust collection of the TsOL, TsN-15, SCN-40, TsN-11, VZP, TsR TsRk, OTI, 4BTSh and LIOT types [2].

The TsOL cyclone is designed specifically for cleaning air masses in agricultural industries, at elevators, feed mills, grain dryers, and granaries. Cyclones of the TsN-15 type are one of the most versatile units The SCN-40 cyclone consists of all types of universal cyclones in different countries and partially in Ukraine. This unit operates in

conditions of high concentration of fine dust and is 2.5 times more efficient than the TsN-15 cyclone. It is also used to handle larger than average dust. The TsN-11 cyclone is practical and not subject to abrasive conditions. Higher quality air treatment and purification from small particles is possible due to the fact that the inlet is located at an angle. Today, having passed all stages of modernisation, VZP dust collector cyclones are widely used in aspiration and pneumatic conveying systems as dust collecting units for cleaning gas-air mixtures from medium and fine grain dust. This cyclone is considered to be twice as efficient as the TsN-15. Cyclones for grain dust collection are primarily convenient because they use much less electricity than other dust collectors and have a low level of resistance, varying from 700 to 900 Pa. The cyclone CRk is a more modern and upgraded version of the cyclone CR. This model is distinguished by the angle of air inlet to the unit and a shortened design. OTI cyclones are designed and developed to separate air mixtures from grain waste. The main advantage of the OTI type unit is its resistance to fluctuations in air flows at the plant inlet. 4BTSh cyclones are usually used as a group of units that are also assembled into battery plants. The main feature of LIOT cyclones is that they were among the first to be used as filters for cleaning aspiration air [2, 3].

Cyclones for grain dust provide cleaning efficiency from grain dust up to 99%, it all depends on the nature, dispersed composition and other features of the dust: hygroscopicity, low density, multi-component, etc., the conditions of dust particles spreading in air flows [3].

Fine grain dust, like any other dust, settles much more slowly, and especially fine dust may not settle at all. The most important issue of dust emission – the choice of dust collectors – is based on the dispersed composition of the dust.

A properly selected, designed and manufactured cyclone can reduce emissions by up to 90% in most cases.

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