

JUSTIFICATION OF MEASURES TO REDUCE DUST EMISSIONS FROM OVERLOADING ROCK ON GRANITE QUARRY

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Introduction. Among the large number of environment pollutants the primary place has mining enterprises with an open pit mine development. On a typical quarry, basic technological processes are drilling and explosive operations, excavation, and transportation, warehousing and dumping (Buchavyi, 2013). All these processes have a negative impact on the environment components, mainly due to air pollution, since there are dangerous substances fall into soils and reservoirs with subsequent migration through trophic chains (Zberovskij, 1997).

In this regard, there is a need to substantiate both technologically simple and environmentally advisable measures to reduce dust and gas emissions from the main technological processes.

Presentation of the main research. Recently the special attention is given to reducing the environmental danger from drilling and explosive operations, in particular due to a decrease in the volumes of destroyed blocks with a simultaneous increase in the number of local explosions, the use of environmentally friendly explosives (Holodenko et al., 2013) and active suppressing agents of the dust-gas cloud (Kolesnyk et al., 2014). However, there is not enough attention to lowering the dust emissions when overloading a rock on granite quarries with conveyor equipment and crushing-sorting equipment of surface complexes.

As a result of the literary analysis and patent search, it was determined that to reduce the emissions of rock mass during its transportation and overloading with the help of the conveyor, it is most appropriate to use irrigation systems.

However, the main problem in irrigation systems operations is clogging of nozzles, and as a consequence of the suspension of water

supply. Thus, for cleaning it is necessary to stop the system, and to disassemble the sprayer, clean and then put back.

For irrigation of the breed during transport, we propose to use a nozzle diagram with a speed Varispray cleaning system, which differs from analogues that the design of new sprayers allows you to exclude a simple one. The peculiarity is that the nozzle itself is made by moving and when clogging the drain channel, it is enough to turn the hole in the opposite side of motion of water. The general view of Varispray nozzles are shown in Figure below.

Figure 1

Varispray irrigation nozzles using for rock transporting by conveyors (compiled from specialisedroadingequipment.com, 2021)



Conclusion. The entire cleaning procedure takes a few seconds, and does not require the workflow stop. Sprayers are made of high-strength plastic that completely excludes corrosion. Simple threaded fastening with external thread 3/4".

Advantages of Varyspray irrigation nozzles using:

- Rotary valve for regulating water consumption and rapid cleaning of nozzles.
- Rigid fan-like sprayers, which provides uniform irrigation with water.
- Small dimensions (important advantage when installing on the lower sieve deck).

It should be noted that it is expedient to use water for irrigation, pumped out of the lower careers. Thus, a means of dust-ignition with irrigation nozzles are very convenient for reducing dust emissions when overloading a mountain mass.

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