

DEVELOPMENT OF A TECHNOLOGICAL SCHEME FOR THE CLASSIFICATION OF COAL CONCENTRATES BEFORE CRUSHING WITH A DRYING IN A "FLUIDIZED BED" SEPARATOR

© **S.A. Kravchenko**, Ph.D. in technical sciences, **G.K. Koskova**, **S.V. Chaplianko**, Ph.D. in technical sciences (STATE ENTERPRISE "STATE INSTITUTE FOR DESIGNING ENTERPRISES OF COKE OVEN AND BY-PRODUCT PLANTS" (SE "GIPROKOKS"), 60 Sumska str., Kharkiv, 61002, Ukraine)

In order to increase the energy efficiency of coke oven and by-product production processes, a technological scheme was developed for the classification of coal charge before the final crushing department in the apparatus for separation and drying of the coal charge - separators with a "fluidized bed" according to the following main initial requirements: the department of pneumatic separation with drying includes two similar technological lines (working and stand by) with the productivity of one line of 250 t/h (working mode – 365 days a year, 17,5 hours a day); coal concentrates arriving at the department are characterized by a size of 0-100 mm (the content of the 0-3 mm size is from 20 % to 70 %); average moisture content of the coal charge: initial 10,5 %, final 5,5 %; heat carrier - coke oven gas combustion products; fuel - coke oven gas.

Based on the results of calculations of material and heat balances, the equipment of the technological line was determined as follow: technological (crusher), including non-standardized one (unlined heat generator, separator, two-position valve, sluice feeders); forced-draft (mill fans); weighing and dosing (sluice feeders); coke (throttle valves); dust cleaning (battery cyclone dust collector, bag filter); continuous transport (belt conveyor); electric welding; chemical; lifting and transport; pipeline fittings; elevators; drives; technological pipelines; technological steel structures, including atypical ones; firefighting equipment; thermal insulation materials, etc.

The developed scheme provides automatic control of all parameters of the technological process and operation of the forced-draft heat generator and other equipment, control of temperature and hydraulic modes of drying and classification in the separator, as well as automatic regulation of all main technological parameters.

Control of all technological units and mechanisms, as well as regulation of technological parameters of the drying and classification processes, is expected to be both automatic and remote, from the operator's control panel.

The economic effectiveness of the introduction of the technology of classification of coal concentrates before crushing with drying in a separator has been justified. The payback period, calculated from the annual economic effect, is about 2 years.

Keywords: hard coal, concentrates, "fluidized bed" separator, unlined heat generator, coal charge, coke oven gas, coal charge classification, coal charge drying.

Corresponding author S.V. Chaplianko, e-mail: chaplianko_sv@ukr.net