

## **TECHNOLOGIC LINE FOR FLY ASH TRANSPORT FROM THE MINE SURFACE FACILITIES AND CONSTRUCTION OF SEALING AND PROTECTIVE RIB TYPE TZOZ**

### Use and description:

This technologic line represents the complex solution for preparing the filling mixtures and piping systém for transporting them using the hydrostatic water column principle in shaft on the mine level including piping transport to the area, where the sealing and protective rib type TZOZ is constructed in the working face. The piping transport system for transporting of filling mixture can be horizontal, upward/downward independently of the inclination.

Based on the order from the area for TZOZ rib construction, the filling mixture is prepared in the mine surface mixing station and after a call the mixture is transported in piping to underground so that the pushing piece is inserted into piping system after achieving the defined volume of the mixture. The transport itself is in progress due to the hydrostatic water column force. After filling the mixture into the bags in area of TZOZ construction and catching the pushing piece, the discharging gate valves near the shaft are remotely opened and the water inducing the pressure is discharged into the sump crosscuts. Further, the rest of the filling mixture is cleaned from the piping system and other technologic parts and so this ordered activity is finalized.

Technologic line consists of:

1. Equipment of mixing plant on the mine surface incl. further technologic parts – see Attachment AREA „A”
2. Equipment for TZOZ rib construction underground incl. further technologic parts – see Attachment AREA „B”
3. Equipment for discharging the pressure water into the sump crosscut incl. further technologic parts- see Attachment AREA „C”

Before the actual construction of the TZOZ rib it is necessary to work up the design, in which the calculation of the hydraulic transport parameters is encompassed (and so also operational parameters), design of individual points of junctions – see Attachment Process automation etc.

All activities necessary for the technologic line design end implementation are ensured by the KOEXPRO OSTRAVA, a.s. company.

### Characteristics (Example):

Depth of the level of construction m 800 ÷ 1 000	m	800 ÷ 1 000
Transport distance on mine level m 1 000 ÷ 3 000	m	1 000 ÷ 3 000
Max. transport head in section (upwards) m 200	m	200
Presupposed transport capacity for mixture for a given seam thickness and daily working face progress m <sup>3</sup> .h <sup>-1</sup> 70	m <sup>3</sup> .h <sup>-1</sup>	70
Seam thickness m 0.70 ÷ 2.50	m	0.7 ÷ 2.5
Number of filling operation per day 2	Cv	2
Mixture volume concentration for piping transport Cv 0.30	mm	0,30
Transport piping ID (DN)/(allowable pressure (PN) mm 100/10	MPa	100/10 0.4 ÷ 0.6

The technologic line equipments have been designed and constructed as the equipment group I (mine), category M2 according to the Directive 94/9/EC of the European Parliament and the Council and meets the requirements for using in areas “dangerous atmospheric conditions 2” according to EN 1127-2+A1 on condition that all national regulations are fulfilled by the employer.

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