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## INDUSTRIAL TESTS OF WASTE ROCK DIRECT BACKFILLING UNDERGROUND IN FULLY MECHANIZED COAL MINING FACE

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### Abstract

For efficient, economical and environmentally disposing the waste rock underground, based on principles of waste direct backfilling in fully mechanized coal mining, this paper carries out a field test in 6304-1 working face of Jining No.3 Coal Mine. We first design a waste rock direct underground processing system, including screening-crushing system, transportation system, transfer system, stope backfilling system and coal mining system. Then optimize the waste backfilling and coal mining technology, update the waste backfilling process with “start backfilling from backfill scraper conveyor’s head to tail, gradually uplift tamping arm, gradually compact backfill materials, move backfill scraper conveyor forward when the tamping arm can’t extend out and last fill roof gap by up material pushed by down material”. At last, imply this system and check strata movement controlling effect by actual measuring the roof dynamic change law, which supported by the dense backfill body. The results show that the test working face can cut 0.6 million tons of raw coal one year, and direct backfill 0.74 million tons of waste rocks at the same time, and the maximum subsidence of immediate roof observed *in situ* is 340mm, the maximum caving speed is 11.89 mm/d, the real compression ratio of backfill body is 90.3%, the overlying strata movement of backfilled area is effectively controlled by backfill body of waste rock.

*Key words:* backfilling technology, coal mining, compression ratio, mining technology, strata movement waste rock

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