

ROCK FRAGMENTATION AND MINING PRODUCTIVITY: CHARACTERIZATION AND CASE STUDIES

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ABSTRACT

The concept of optimum fragmentation in surface mining operations, i.e. the degree of fragmentation to which corresponds the lowest overall associated costs of drilling, blasting, loading, haulage and crushing, was developed more than thirty years ago. Recent field investigations using novel technologies, which have been completed by ICI Explosives Canada and by others, indicate that this ultimate goal of optimum fragmentation is closer to becoming reality.

The main technological advances emerging in the mining industry which enable comprehensive field investigations are automated fragmentation assessment by image analysis, laser profiling, Global Positioning Systems, drill, shovel and hauler monitoring as well as digital communication data links. This paper describes the requirements for fragmentation assessment and measuring the effects of fragmentation on mine production systems. Applications of appropriate novel technologies are outlined through reference to selected case studies.

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