

A BLASTING EFFICIENCY DESCRIPTOR "BED"

(for surface blasting)

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ABSTRACT

Using the Scaled Distance (SD) and the vector sum Peak Particle Velocity (PPVs) from a single delay, preferably single blasthole, in a shot, a number is derived which has shown itself to be consistently related to blasting efficiency, as experienced by one of the authors of this paper over the last thirty years. The numbers derived by this process range in value over one order of magnitude more or less. This variation, a function of distance, weight of explosive in the delay, blasthole diameter, blast design, powder factor and the geological environment, can be consistently related to two of these factors, powder factor and distance. In actual use the measured "BED" representing good blasting results should not vary by more than + 33 to + 50 percent of the estimated "BED" in non calibrated cases, and + 10 to 20 percent where previous experience is available. Relatively high "BED" values are indicative of poor blasting results while relatively low "BED" values may be precursors of poor blasting results in a shot. There are many variables in the geological environment which can affect the "BED". A case study is presented from a surface coal mining operation in eastern Canada. This case study tries to evaluate the reasons for the variability in "BED" values derived from multi-hole shots. A problem in using "Signature Vibrations" from a single-hole shot to predict blasting vibrations from multiple-hole production shots is identified.