

Energy, Strength and Performance, and Their Implications in Rating Commercial Explosives

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ABSTRACT

Several parameters such as, Energy, Strength, Brisance, Impulse, and Bubble Energy, are in common use in the explosives industry today to rate commercial explosives in terms of blasting performance. However, this multiplicity of terms, their frequent interchange and their purported one-to-one correlation with expected performance have given rise to a considerable amount of confusion, and have often resulted in unrealistic rating of explosives. In this paper, various theoretical and experimental methods of estimating energy and performance of explosives are discussed and their relative merits examined. These methods include, Computer Code Calculations, Cylinder Test, Trauzl Test, Ballistic Mortar Test, Underwater Test and Model-scale blasting. It is shown, in the light of actual blasting process, that such measures cannot be considered accurate indicators of expected blasting performance as the properties of rock to be blasted are either totally ignored or only partially accounted for in these methods. It is also shown that no single technique alone among those currently employed by the explosives industry can lead to realistic rating of explosives in terms of expected blast results. The need for the adoption of a two-tier rating system, one based on chemical potential "energy", and the other based on blasting "performance" is proposed, and specific approaches to achieve this objective are outlined.