

Subtek 4D™: Optimised blasting performance through the application of new underground bulk explosive technology.

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ABSTRACT

Bulk explosive technology for underground mining has not seen any significant technological advances since the widespread transition from ammonium nitrate fuel oil (ANFO) to ammonium nitrate emulsions (ANE) commencing in the 1980's. The in-hole energy profile that conventional ANE systems deliver is limited by the basic physics of chemical gassing and simple control systems. This compromises the range, precision, and accuracy of energy delivery into the blasthole, and in some cases limits the length of charge that can be delivered. Orica's Subtek 4D™ technology removes many of these constraints, enabling optimisation of blasting performance across all underground mining methods. This paper reviews work completed at three mining operations across Australia, the United States, and Chile with a focus on how this system can optimise mining operations and deliver sustained commercial and productivity benefits into the future. These benefits include improved ore recovery, reduced waste rock dilution, and reduced overall explosives consumption. This paper also reviews how this new technology can be applied for planning future mining operations.