

OPPORTUNITIES FOR IMPROVED SAFETY AND MINING ECONOMICS

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ABSTRACT

Commercial explosive use in China has been dominated by powdered AN-TNT mixes. Water gels and emulsions are now gaining market acceptance because they offer potential for better performance. Although raw material costs for emulsions initially may be more than AN-TNT mixes, the more expensive technology improves sensitization and leads to lower costs overall for mining operations. A recently completed study in northeast China compared microsphere-modified emulsions to AN-TNT and lower-cost emulsions. Testing of microsphere-modified emulsions at several pH levels indicated a high degree of stability and consistency of VOD. Using 42 mm blastholes in underground mines and 170 mm holes in sandstone open pit mining demonstrated the superior performance of glass microsphere sensitized emulsions. Comparisons of explosive cost, drilling cost, secondary blasting cost and muck pile profile were favorable to the microspheres-sensitized-emulsions. Noxious fumes with AN-TNT or with water-based systems that partially fail during detonation are also a concern. Efficient detonation of emulsion products sensitized with hollow spheres appears to reduce fume generation. Prolonged storage or exposure to water also is not a problem.