THE COMPUTER MODELING OF SINGLE HOLE, REDUCED SCALE BENCH BLAST FRAGMENTATION

Steven V. Crum and Mark S. Stagg
United States Bureau of Mines
Twin Cities Research Center
Minneapolis, Minnesota 55417

ABSTRACT

The Bureau of Mines is conducting research to develop methods to control fragmentation and improve productivity in surface mine blasting. As part of this research, PRONT02D, a two-dimensional finite element computer program developed at Sandia National Laboratories, was employed to model the fragmentation produced from RS-50, a single hole, reduced scale bench blast in a massive dolomite. The fragment size distribution obtained from the computer simulation was calculated using a submodel that utilizes the crack density and nominal flaw size values computed by PRONT02D.

The computer program successfully modeled the plus 1.5 inch to minus 9 inch fragmentation observed from the RS-50 blast. The results assume that these fragment sizes were created from stress wave mechanisms only and that little or no stress wave reflection off the borehole-rock interface occurred Parameters used for the rock and explosive