

MAJOR MINING RESEARCH PROGRAMS CONDUCTED BY BITUMINOUS COAL RESEARCH, INC., FOR THE UNITED STATES BUREAU OF MINES. R. D. Saltsman, Bituminous Coal Research, Inc., 350 Hochberg Road, Monroeville, Pa. 15146; Joseph Grumer, U.S. Bureau of Mines, 4800 Forbes Ave., Pittsburgh, Pa. 15213; Kelly Strebis, U.S. Bureau of Mines, Twin Cities, Minnesota 55111.

Enough rock dusting prevents a coal dust explosion from propagating by absorbing heat from the otherwise possible flame. Theoretical calculations are presented which compare adiabatic flame temperatures for coal and coal plus rock dust with adiabatic flame temperatures of gas flames at their lean limits of flammability; these calculations show that concentrations of rock dust in mine dust determined empirically to be necessary to inert coal dust are reasonable. Based on this, United States mines are equipped to maintain certain incombustible levels in the settled dust, created during the mining process, by applying rock dust to the surfaces created when the coal is removed. Monitoring and enforcing these requirements are time-consuming and expensive. Results of a data gathering and statistical study to find methods and procedures for reducing the number and quantity of samples required are described. The present respirable dust standards that American coal producers have to meet require new developments. Optimizing the conventional use of air and water to control the respirable dust will not be sufficient. One promising method involves the flushing of the cutting bits with water while the bits are cutting coal. The water flushing concept, pioneered in England for longwall machines, has been adapted to American continuous miners. The problems encountered and the results obtained to date, will be described.