

# Coal Producer Improves Safety and Opens New Mining Areas with Advanced Water Spray Technology

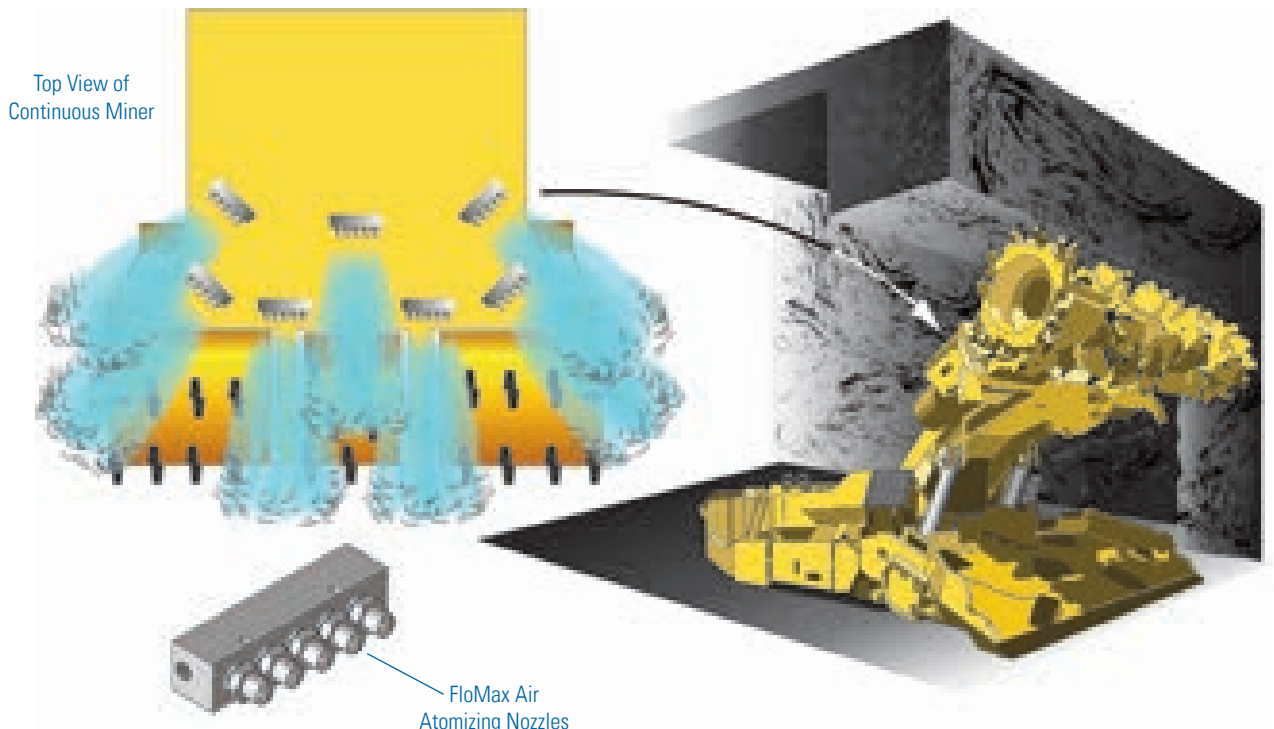


## Problem:

A leading coal producer in the United States needed to dissipate methane gas in an underground mine to eliminate the possibility of ignition. Certain areas of the mine near methane well sites were considered unsafe because of the higher concentration of methane gas. Saturating the air to a specific humidity prevents the methane from igniting. The hydraulic nozzles used on the continuous miners were unable to produce the small droplets required to humidify the air.

## Solution:

Spraying Systems Co.'s FloMax® air atomizing nozzles provided the ideal solution for this coal producer. FloMax nozzles produce very small droplets at low flow rates for effective dust control and humidification – between 40 and 60 microns. The nozzles are mounted on the continuous miner in seven banks of five nozzles each. During operation, these nozzles create a curtain of fine mist that suppresses dust, dissipates the methane gas and prevents the possibility of ignition.





## Coal Producer Improves Safety and Opens New Mining Areas with Advanced Water Spray Technology – Continued

### Results:

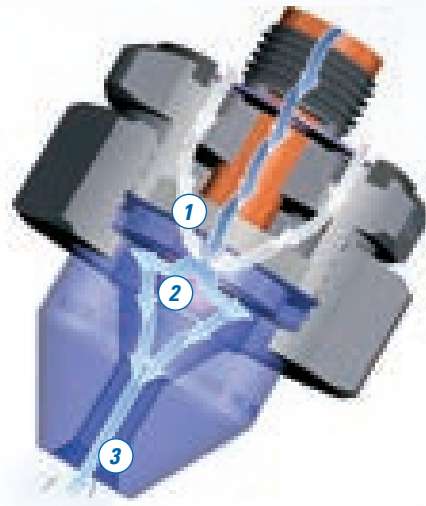
FloMax® air atomizing nozzles have improved safety in the mine and allowed the coal producer to mine areas that were previously untapped. Because the production value of a single continuous miner can far exceed US\$50,000 per day, the additional coal produced in the mine resulted in a payback period of less than two weeks. Since the original installation, three additional continuous miners have been equipped with FloMax nozzles.

### A CLOSER LOOK AT THE SYSTEM



#### FloMax X Series Air Atomizing Nozzles

FloMax X series nozzles use a patented multi-stage cross-hole design that provides superior atomization by shearing the liquid prior to mixing with the high-velocity air stream. This process yields smaller droplets at lower operating pressures than other nozzles. Flow rates range from 0.5 to 1.5 gpm (1.89 to 5.67 lpm).



#### FloMax X Series: Principle of Operation

- ① Stage One: Primary Fluid Breakup  
The cross holes in the liquid orifice split the flow into four smaller streams.
- ② Stage Two: Secondary Fluid Breakup  
The liquid – all four streams – is sheared by air as it exits the cross holes.
- ③ Stage Three: Final Mixing  
The air cap acts as a final mixing chamber. As liquid exits the orifice, an additional pressure drop provides the final atomization.



**Spraying Systems Co.®**  
Experts in Spray Technology

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