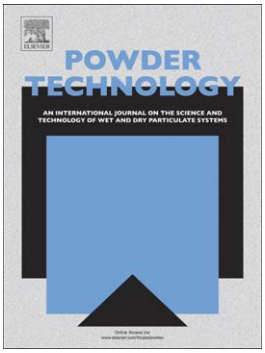

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Investigation on the new design of foaming device used for dust suppression in underground coal mines

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Abstract: To solve the drawbacks of the conventional foaming method used for dust suppression, a new foaming device is designed through integrating the foaming agent adding device and foam generator. Its performance is investigated experimentally under different working conditions. Testing results show that foaming agent is automatically added into the device at the working water flow of 0.84-1.12 m^3/h and water pressure of 0.3-0.52 MPa. The reasonable compressed air flow is 45-48 m^3/h, in which range the foam flow and expansion ratio both reach the maximum. The foaming device requires a minimum air pressure of 0.46 MPa to meet the outlet pressure demand. Field application proved that foam technology using the new foaming device made a marked dust suppression effect. The foam dust suppression efficiency was 87.1%-88.3%, much higher than that achieved by the roadheader water spraying. In addition, foam used less water that relieves the water supply