

**Airo-Dust®**  
Stone Dust Additive



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Airo-Dust is the commercial name for the manufacture and application of coal mine approved stone dust as a wet foam. Airo-Dust additive is a complex blend of surfactants used as an integral part of the Airo-Dust process, to treat the stone dust applied to coal mine walls as an explosion retardant. The use of Airo-Dust prevents the stone dust from caking and enables it to retain the required dusting action in the event of an explosion.

### Benefits

The Airo-Dust application as foamed wet stone dust slurry can be applied to both inbye and outbye operations

- Without stopping production
- Increases available production cutting time
- Provides improvements in safety standards
- Reduction in mine operating costs
- Easy sampling
- Safety in the knowledge that the process will work to prevent the propagation of a coal dust explosion

### Process

The patented process consists of five main steps;

- Step 1.** Combining mine water and stone dust to create wet slurry stone dust
- Step 2.** AiroDust additive into is introduced into the slurry stream as it is pumped into the third step in the process
- Step 3.** Slurry enters the mechanical foaming unit where air is added to create the designed foam density
- Step 4.** The foam is sprayed onto the mine roadway surface
- Step 5.** The foam dries as the moisture evaporates into the mine ventilation

## Application

The Airo-Duster is a purpose built trailer, used to mix and spray slurry stone dust to mine walls underground. Airo-Dusting is a newly developed process that uses an Airo-Dusting additive dosed into the slurry inlet at 10 litres of additive per tonne of stonedust. This additive in conjunction with the onboard compressed air systems, create a highly vesicular foamed stone dust product that disperses in a weak methane explosion.

The Airo-Duster trailer is a four wheel trailer designed and engineered to carry 3 tonnes of stone dust and 1200 litres of water. The trailer includes a slurry pump, delivering approximately 30 litres of product per minute. There is an Airo-Dusting additive pump that delivers a calibrated amount of additive into the inlet of the slurry pumps when the slurry pump is running. On the outlet of the slurry pump a specially designed foaming unit is fitted. This device combines the air, slurry and the additive that creates the foamed mix.

*Operator spraying Airo-Dust on the rib of a cut through.*



*RHS showing sprayed area with Airo-Dust and LHS not sprayed*



*Airo-Duster underground where Airo-Dust has been sprayed*



*Airo-Duster underground where Airo-Dust has been sprayed*



## Technical Information

### Typical sampling results

Results for Roadway Dust Analysis:

Sampling date	% Inherent Moisture	% Incombustible Material	% Incombustible	Sampling date	% Inherent Moisture	% Incombustible Material	% Incombustible
3/06/2015	0.8	93.9	93.9	3/06/2015	0.5	96.2	96.2
3/06/2015	0.5	95.4	95.4	3/06/2015	0.2	97.5	97.5
3/06/2015	1.3	88.4	88.4	3/06/2015	0.2	98.2	98.2
3/06/2015	0.4	96.1	96.1	3/06/2015	0.8	91.9	91.9
3/06/2015	0.3	97.2	97.2	3/06/2015	0.8	91.7	91.7
3/06/2015	1.4	87.1	87.1				

**Reference:** Roadway dust analysis by gravimetric using Simtars in house procedure LP0012.

### Airo-Duster Trailer

Specifications and Dimensions		Mix Design	
Tare weight of the attachment:	4600kg	Stone dust per batch:	3000kg
Gross weight of the attachment:	8830kg	Water per batch:	1200 litres
Hydraulic operating system pressure:	1500 PSI	Additive Storage capacity:	30 litres
Length of trailer:	4550mm	Slurry quantity per batch:	2340 litres
Width of trailer:	2785mm	Foam quantity per batch:	10 575 litres
Height of trailer:	1750mm	Foam expansion ratio:	4.52:1

Application	
Typical underground coverage @ 1kg/ square metre:	180m
Average foam thickness:	3.5mm
Slurry density range:	1700 - 1900 grams per litre
Foam density range:	300 - 500 grams per litre

### Ordering information

Part number	Description	Size
A3396-15	Airo-Dust Additive 15 Litre	15 Litre
WEQUIP	Airo-Duster Trailer	1

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