

Project Summary : COL 027

Project Title:	Handbook to reduce the exposure of workers to dust 145p.		
Author(s):	Members of the Special Interest Group On Dust and Ventilation	Agency:	CSIR: Mining Technology
Report Date:	1996	Related Projects:	
Category:	Coal	Guideline	Occupational health

Summary

The handbook to reduce the exposure of workers to dust flows arose out of a SIMRAC project dealing with dust in collieries. The objective was to update the previous guidelines, making them pertinent to ventilation and dust suppression systems which are presently being used on mines.

In drawing up this handbook cognisance was taken of the latest technologies which are employed on mines as well as the legal framework in which these technologies are applied. The use of modern tools and instruments as well as the latest means of evaluating ventilation methods have also been included.

The handbook covers the fundamentals of dust, the measurement of dust, strategies to reduce worker exposure to dust, reducing the generation of dust and preventing dust from becoming airborne. Other topics include the use of scrubber systems to control the airborne dust (an example of the layout of a scrubber is given in Figure 1), water applications and reticulation networks, and ventilation practices.

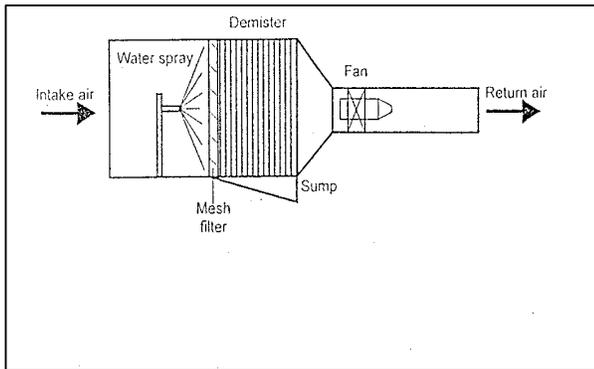


Figure 1. Flooded-bed scrubber layout

Computational fluid dynamics (CFD) is rapidly becoming invaluable as a predictive and design tool as it is fast, accurate and cost effective. These computer simulations are often free from limitations imposed on analytical and experimental methods with the only limits to CFD being the speed and size of the computer, the time availability to solve the problem, and the ability to understand and model the situation, with its complex phenomena, accurately. The main purpose of CFD is not to replace experimental work, but to provide information where it is dangerous or even impossible to perform experiments. It is also a very cost effective way to examine possible solutions to a problem.

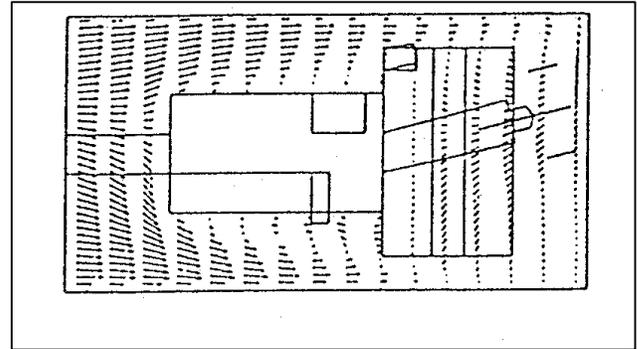


Figure 2. Detail of velocity vectors on x-y planes in the vicinity of the machine

A chapter in this handbook reviews the application of CFD in evaluating and improving environmental conditions in mechanical miner headings, as well as providing a brief history of the development of the CFD model, and a discussion on a typical application.

The handbook is directed at personnel on mines, allowing an understanding, not only of the problem, but also of the process which can be used to combat the occurrence of dust in workings. As this handbook is to be used by a diverse level of mine staff, ease of reading and understanding was strived for at all times.

Conclusions

- X This handbook will serve as a reference base for those in supervisory positions, and those responsible for maintaining lower levels of dust in the occupational environment.