

DUST 20 QUESTIONS AND ANSWERS

Prepared by the Yorkshire Division Dust Prevention Committee.
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INTRODUCTION

The following notes have been prepared primarily for Pit Consultative Committees at the request of the Divisional Dust Prevention Committee. The text has been agreed between the Medical and Safety Branches of the National Coal Board and H.M. Inspectorate and follows to some extent that of the pamphlet on 50 Questions and Answers about Dust, published by the East Midlands Dust Suppression Committee in 1957. This source is gratefully acknowledged.

The object is to stimulate interest in order to emphasise the dangers of coal dust. The co-operation of all is sought so as to minimise the production of coal dust in the mine.

Your Area Medical, Safety or Scientific Officer is always available to explain his aspect of the subject in greater detail, but the subject matter is dealt with very briefly in the following list of questions and answers.

THE PROPERTIES OF MINE DUST

1 Q. Why is the subject of dust attracting so much thought and attention in the Coal Mining Industry today?

A. Chiefly for two main reasons: Firstly, because coal dust and various types of rock dusts are dangerous to health and secondly, because coal dust creates an explosion risk.

2 Q. Is rock dust dangerous?

A. Yes, but some kinds—those with a lot of silica—are more harmful than others and also more harmful than coal dust. Limestone and other stone dusts used in mines to prevent coal dust explosions are carefully selected to reduce as far as possible, any risk of their causing chest trouble.

3 Q. What is pneumoconiosis?

A. The word 'Pneumoconiosis' merely means 'lung dust disease'. It is caused by very fine dust particles which have reached the depths of the lungs and stayed down there. Nature seals off such particles in layers of covering tissue and the resulting little nodules show up as shadows on an X-ray film.

4 Q. Is it possible to see the dust that causes it?

A. No, not directly. When air is breathed which contains coal dust, the larger particles are either stopped by the nose or mouth or are removed fairly quickly from the lungs. A small fraction of the very small particles however may be retained in the lungs. It is, therefore the very small particles, invisible to the human eye, which carry with them the danger of pneumoconiosis.

5 Q. What are the symptoms of Pneumoconiosis?

A. The slighter degrees of pneumoconiosis do not usually cause any symptoms of disability, and even when the X-ray shows quite a lot of 'dust nodules' there may be little or no disablement.

With advanced pneumoconiosis there is usually a good deal of shortness of breath.

6 Q. If a man is breathless on exertion, does it mean that he has pneumoconiosis?

A. Not necessarily. Bronchitis and other chest diseases which may not be due to dust at all and even smoking can cause breathlessness.

7 Q. Is pneumoconiosis ever a serious disease?

A. It may be, but it is not usually serious in its earlier 'simple' form unless it is accompanied by bronchitis or other lung disease. Sometimes however, the little 'dust nodules' in the lungs grow large and fuse to form bigger clumps—the so called 'complicated' form. It is the second rare and more serious condition that has given pneumoconiosis its bad name.

8 Q. What action should a man take if he thinks he has pneumoconiosis?

A. He should consult his own doctor or the Area Medical Officer. Either of these doctors can arrange for him to be seen by a chest specialist if that is necessary. If his suspicions are then confirmed he will be advised and helped to lay a claim at the nearest office of the Ministry of Pensions and National Insurance. If the Ministry's Medical Officers agree too, they will tell him so and arrange for the payment of any benefit to which he may be entitled. They will also ask his permission to tell the Colliery Manager so that he can arrange for suitable work from then on and it is greatly to the man's own interests to consent to this.

9 Q. If a man has pneumoconiosis, should he continue to work underground?

A. He can if he likes, but the Medical Officers of the Pneumoconiosis Panel always offer advice on this point and the best thing to do is to accept their advice. If the dust conditions under ground are well within the 'approved limits' a man with a not-very-bad pneumoconiosis can often continue to work there without worsening his condition. A man with advanced or 'complicated' pneumoconiosis will usually be advised to give up work underground.

10 Q. Is any research being carried out on this subject?

A. A great deal. Organised research is being carried out by the Medical Research Council, by the Safety in Mines Research Establishment, by the N.C.B. Medical and Scientific services and in hospitals and universities. The N.C.B. launched the Twenty-five Pit Scheme in which special teams of Medical Officers and Scientists are studying every class of worker and every working place at these twenty-five collieries. In this way, the development of pneumoconiosis can be detected at its earliest stage and related to quantity and type of dust breathed by the worker.

11 Q. What else is being done?

A. Strenuous efforts are being made to bring every face at every colliery within approved limits. Mobile units go from colliery to colliery in this Division X-raying every miner every five years to ensure that any onset of pneumoconiosis is found at an early stage and to give warning where dust conditions are still a hazard.

DUSTINESS STANDARDS

12 Q. What are the standards for 'approved conditions'?

A. Two main standards based on the concentration of dust particles in the air are laid down, one for coal dust and one for rock dust. Rock dust is considered to be more dangerous to health than coal dust and the limits are therefore correspondingly lower. The upper limit for coal dust is 700 p.p.c.c. (i.e. particles per cubic centimetre) of air in the 1 to 5 micron range and for rock dust 250 p.p.c.c. in the 1 to 5 micron size range. (One c.c. is roughly the volume of a cherry and one micron is 1/1000th millimetre or 1/25000th inch).

13 Q. What method is used to determine the dust count of the air in working places?

A. The most reliable method at present in general use for determining the dustiness of a place is by means of an instrument known as a thermal precipitator. With this instrument a measured sample of air is taken and the dust particles which are considered to be of dangerous size are deposited on to a glass slide and later counted in the laboratory by means of a microscope. Methods giving more information are being developed.

ROUTINE DUST SURVEYS

14 Q. Are all working faces sampled for dust content?

A. Yes. All faces are sampled at regular intervals, the samples being taken near to the face in the return gate or at the return end of the face itself.

REPORTS ON DUST CONDITIONS

15 Q. What action is taken when a working place has been examined?

A. The results of the dust tests are given to the colliery manager who has a continuing responsibility under the Mines and Quarries Act to reduce dust concentrations. Records of the dust surveys are open to inspection by H.M. Inspectors of Mines and independent checks are made by them from time to time.

16 Q. Are other officials interested in the dust survey?

A. Yes: There is a Divisional Dust Prevention Committee consisting of representatives of H.M. Inspectorate, the Safety in Mines Research Establishment, the National Coal Board, the National Association of Colliery Managers, the National Association of Colliery Overmen, Deputies and Shotfirers and the National Union of Mineworkers, which takes an active interest in all matters relating to the dust hazard.

DUST SUPPRESSION — MANAGERIAL ACTION

17 Q. What practical measures can be taken to improve unsatisfactory conditions?

A. Specialist Dust Suppression Officers are appointed in each Area to advise Managers on the best means of controlling the make of airborne dust and to ensure the proper installation and maintenance of dust suppression equipment.

18 Q. What is the most effective method of suppressing the dust?

A. The application of water in sufficient quantity and in the proper place is the best answer to the problem. Since water cannot be expected to bring down dust already airborne, the water should be applied as near as possible to the point where the dust is produced in order to wet the dust and prevent it being carried away in the air current. The water is used either in the form of jets or fine sprays as on coal cutters, power loading machines, ripping machines, rock drills and at transfer points. It may also be forced under high pressure into the coal crevices (long or short hole infusion where it wets any dust which may be contained in the breaks before the face is cut and filled out. This method of application ensures that the water thoroughly wets the coal before it is disturbed and thereby prevents the dust mixing with the air stream.

A second aim should be to keep the loaded coal moist so that the dust will not be picked up by the intake air as it passes over the gate conveyor. This can best be done by the use of automatic sprays situated as near to the face as possible and also at other places along the conveyors if necessary. The velocity of the air in the gate is often quite high. This tends to dry the dust which can again become airborne. If it does, the air passing along the face may be quite dusty irrespective of any face operations.

The Colliery Deputy can do a great deal to ensure that dust suppression measures are in operation and are efficient.

DUST SUPPRESSION — INDIVIDUAL ACTION

19 Q. What can the colliery workmen do about dust?

A. Every person concerned with dust suppression devices can do a great deal to improve conditions both for himself and others by ensuring that the dust suppression equipment is used to its fullest extent. He should particularly remember that any dust he makes is swept along with the ventilation and may harm men in its path even a mile away.

THE EXPLOSIBILITY OF COAL DUST

20 Q. Coal dust is an explosion hazard. Why is this?

A. Fine coal dust can combine with the oxygen of the air and produce an explosive mixture, but some dusts are less explosive than others. Although the quantity of dust in the air is not normally sufficient to become explosive, a cloud of dust may be raised from the roof, sides or floor and may become potentially dangerous. It is essential therefore, to keep the make of dust to a minimum by effective suppression measures and constant cleaning up. The application of stone dust on the roadways reduces the risk of an explosion. Stonedust barriers are a second line of defence in conveyor roadways. Their function is to arrest an explosion and so minimise its effects should one unfortunately occur. A further line of defence is the spreading of stonedust at conveyor gate roadheads with the object of arresting an explosion which might occur at the face or at the ripping lip.