

Dust in the Workplace

Guidance for Health and Safety Representatives

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Guidance for union health and safety representatives

Background

In many workplaces dust is a major problem. However dust can be more than just a nuisance – it can be a killer. This guidance is intended to outline the problems that can be caused by dust and give advice on what employers should do to protect workers.

Dust is simply small particles in the air. Often these particles are too small to be seen but, because they are airborne, they can be breathed in through the nose and mouth.

It is the size and chemical nature of the dust particles that determine the effect they have on the body. Larger sized particles are called *inhalable dust*. Most of this will be filtered out in the nose and throat. Smaller size dust (called thoracic dust) can reach the lungs. If the dust is small enough it can be inhaled deeply. This is called *respirable* dust. Very small particles can pass through the lungs into other organs of the body. Smaller particles also stay in the air for much longer so can be a danger for a longer period of time.

Usually the smaller particles are the most hazardous but inhalable dust can also cause major health problems. A lot of dust however contains particles of different sizes and may be a mixture of inhalable and respirable.

Dust can be caused by a huge number of processes and comes in many different forms. It is divided into two types - organic and inorganic.

Inorganic dusts come from stones, chemicals and metals. Among the inorganic dusts that workers encounter are cement, coal, asbestos, metal, concrete, talc, stone, grout and sand.

Organic dusts come from living things and include dust from textiles, wood, poultry, leather, grain and flour. These often also contain fungal spores and microbes. Dusts can also come from organic chemicals such as pesticides and dyes.

The two most serious health problems caused by dust are cancers of the lungs, throat and nose, and other lung conditions called Chronic Obstructive Pulmonary Disease (COPD) that includes chronic bronchitis and emphysema.

No-one knows how many deaths are caused by workplace cancers. A report in 2007 gave a likely figure of between 7-8,000 for cancers of the lung, the lining of the lung and the nose that are due to work. The TUC believes that this is a low estimate and the true picture could be much worse. A further 4,000 people die each year as a result of COPD caused by exposure to dusts in the workplace. This means that dust is, by far, the biggest cause of work-related death.

However these are not the only cancer and COPDs that dust can cause. Many dusts also cause asthma and other allergies, rhinitis and even heart disease. Many can also be an explosive hazard if they are allowed to build up.

Some of the diseases caused by dust take decades to develop and once symptoms appear it is too late. Often the worker will have left the workplace by the time they develop a cancer or COPD, especially in industries with a high turnover like construction.

Not just a problem of the past

Often people think the problems of dust have long gone as most of the exposure was from industries that have disappeared such as coal mining and textile manufacturing. This is not the case. There are still huge problems with dust in a wide range of workplaces including bakeries, quarrying, agriculture and construction. In some sectors the problem is getting worse. Recycling has led to a whole new sector of workers being exposed to a wide range of dusts, while in construction refurbishment work is more common and the use of materials like plasterboard mean that often workers are exposed to very high levels of dust. The same is true in some manufacturing processes and warehousing where increased use of MDF has led to a significant dust problem.

The law

There is a general duty on employers to protect the health safety and welfare of their workers and the public. There are also a range of regulations that cover dust.

The main one is called the Control of Substances Hazardous to Health Regulations (COSHH), although employers have to also be aware of other regulations such as the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR).

The COSHH definition of a substance hazardous to health includes dust of any kind when present at a concentration in air equal to or greater than 10 mg/m³ of inhalable dust or 4 mg/m³ of respirable dust as measured by a formulae that takes account of the length of time that a person is exposed, so it is the equivalent of an 8 hour day. This is called the 8 hour TWA. If any worker is exposed above these levels employers are meant to take action to remove the risk.

In addition some dusts have been assigned specific Workplace Exposure Limits (WELs) and these limits should not be exceeded. There are over 500 substances that have been given a WEL, including many dusts. There are separate regulations covering asbestos dust.

Unfortunately a lot of dust does just not contain one substance. It could be a mixture of different substances, some of which are covered by the dust exposure limit and others may have their own WEL. However if a mixture of dust includes a substance with a WEL then the exposure must be managed at least below the WEL for that substance.

Control Measures

Where there is any exposure above the level of a WEL the employer should take action. However this does not mean that the employer can just allow workers to be exposed up to the level of the WEL. The employer must not wait for the dust to become a hazard before acting.

COSHH defines a number of trigger points and every employer should undertake a risk assessment. In the case of substances that cause cancer, mutations or asthma the exposure must be reduced to as far as is reasonably practicable. In other cases if there is any evidence of a risk to health, even at below the level of the WEL, employers must remove or reduce the risks.

Employers therefore have a duty to control any hazardous substances, regardless of exposure and there is an order of priority for those actions the employer is meant to take, this is:

- eliminate the use of a harmful substance and use a safer one
- use a safer form of the product, such as paste rather than powder
- change the process to emit less dust
- enclose the process so that the dust does not escape
- extract dust near the source
- have as few workers in harm's way as possible, and
- provide free personal protective equipment (PPE) such as a respirator. PPE must fit the wearer.

This means that employers cannot protect workers simply by giving them face masks and continue to let them work in dusty conditions. They first have to look at other ways of preventing the dust getting into the air either by using other materials or introducing ways of keeping dust out of the atmosphere.

Often solutions can be simple such as using water to prevent dust being formed during grinding or the cutting of stone or local exhaust ventilation in woodworking workshops. Using pre-mixed dough in bakeries has also helped cut asthma rates among bakers.

Personal Protective Equipment and Face Masks

Where other methods of controlling dust, including ventilation and extraction, have been tried and there is still dust in the atmosphere then respirators or face masks should be the last resort. Many face masks are useless against respirable dust, or are so uncomfortable that the wearer does not use them. This is especially true when they are used for long periods as they get wet and uncomfortable. Also the mask has to fit the face of the worker so needs to be available in all sizes, and different protection may be necessary for workers with beards. There are three classes of face mask. The lowest one (P1) only filters 80 per cent of airborne particles. The top range (P3) collects over 99 per cent, but only if there is no leakage and the masks are worn properly and well maintained. The kind of disposable masks found in DIY stores are not suitable for most workplaces.

Detailed advice on breathing protection can be found in the Health and Safety Executive (HSE) guidance [HSG53](#).

Health Surveillance

Unfortunately many employers do not recognise the dangers of dust, and so do not take any action to prevent exposure to it. This is particularly a problem where the dust particles are too small to be seen. This is the kind of dust that is usually most dangerous

because it can get deep into the lungs, but often the employer and the workers will not be aware that it is there unless they are monitoring the air.

The law requires an employer to carry out health surveillance where workers are exposed to a dust linked to a disease or illness if it is likely that the illness is linked to work and can be detected. However, the TUC believes that whenever workers are exposed to dust, employers should be checking the health of their workforce. This should include regular lung function tests. Health surveillance should be done by an occupational health service specialist. If a GP offers the service, employers (and unions) need to be sure that they are competent in occupational medicine and can interpret the results. The HSE produces a guide called [Health Surveillance at Work](#) which provides guidance on how employers can fulfil their legal duty to provide health surveillance. Union safety representatives should have access to summary information from any health surveillance.

The HSE has produced a lot of good material about the dangers of dust, both generally and for specific industries. It has also developed practical guidance for employers on how to use COSHH called [COSHH Essentials](#). However, safety reps should also search the HSE website for any advice on their particular industry.

Unfortunately, despite the detailed regulation on exposure limits, monitoring and surveillance, there is far too little enforcement action as many of the industries with big dust problems are mainly small or medium-sized workplaces where the chances of seeing an inspector are very low.

Why the dust limit is far too high

The TUC believes that the current standards used for the assessment of dust exposure in the workplace are totally inadequate. There is now clear scientific evidence which suggests that the current UK limits for inhalable and respirable dust of 10 mg/m³ and 4 mg/m³ respectively should be much lower.

This view is supported by the Institute of Occupational Medicine (IOM), an independent, non-profit organisation that works outside of government to provide unbiased and authoritative advice to decision makers and the public. The IOM has said that “the current British occupational exposure limits for airborne dust are unsafe and employers should attempt to reduce exposures to help prevent further cases of respiratory disease amongst their workers”.

There is a wide range of research that shows that a considerable number of the cases of cancer and COPD caused by dusts are caused by exposure that is below the current legal limit.

Research done for the HSE in 2006 looked at five kinds of dust, including coal dust, talc and kaolin. For coal dust, the evidence showed sizeable reductions in lung function at exposures as low as 1 mg/m³ over a working lifetime of 40 years. The data from other dusts is even more worrying. The four dusts which were compared with coal dust all showed more severe effects on the lung at the same exposure levels. HSE data suggests that at least 12 per cent of workers could develop significant reductions in their lung function, with profound results for their respiratory health.

Because of the serious health risks that exposure to dust can cause the TUC believes that unions and union health and safety representatives should try to ensure that employers follow a precautionary standard of 2.5 mg/m³ for inhalable dust (as opposed to the current 10 mg/m³ standard) and 1 mg/m³ for respirable dust (as opposed to the current 4 mg/m³ standard) for all general dust and dusts where there is not a lower WEL.

Case study - silica

HSE research shows that exposure to silica, even at legal levels, is leading to many health problems, including deaths from cancer. Silica is found in many common building materials including sand, stone and cement. It causes a chronic and disabling lung condition called silicosis. The current maximum exposure level means that 2.5 per cent of those exposed at that level will develop silicosis after 15 years.

In addition silica can cause cancer. Research published in 2011 showed that, if the current exposure level for respirable crystalline silica were to be cut from the present 0.1 mg/m³ to 0.05 mg/m³ it would prevent over 200 deaths between now and 2060.

However the problem is more than just the legal maximum exposure levels. It is also enforcement. HSE funded research shows that compliance rates are actually only 33 per cent. If there was proper enforcement, and the rate of compliance were to be raised to 90 per cent the number of deaths prevented could be around 700.

The conclusion of the researchers was that if the exposure level were to be reduced and enforcement increased the rate of lung cancers caused by silica exposure could be cut from the present 2.07 per cent of all lung cancers to almost nothing.

Role of health and safety representatives

The best protection that workers can have is a strong union that ensures that they are protected. Union safety reps should:

- check that risk assessments include the dangers of dust and that the employer has proper procedures in place to control it
- ensure that all parts of the workplace are regularly monitored for levels of workplace exposure to both general dust and any specific types of dust that may have lower WELs. Safety reps have the right to see the results of any monitoring exercise
- search the HSE website for any specific advice on your sector. Your union may also be able to give you advice
- if the level of dust is above the limits for inhalable and respirable dust of 10 mg/m³ and 4 mg/m³ then the employer has a legal responsibility to take action. If they refuse then contact your enforcing authority (the HSE, local council or ORR).

- if the level of dust is still above the TUC's recommended precautionary dust standard of 2.5 mg/m³ and 1 mg/m³, then you should still try to ensure that action is taken to reduce it to that limit. Seek an agreement with the employer that they will not exceed the TUC limit
- make sure that your members are aware of the possible dangers from dust. This can be done jointly with the employer if they agree
- if there may be a dust problem, is the health of your members being checked? Do you have access to the health reports?
- check that the employer is following the order of priorities by trying to prevent and control the hazard before using PPE?
- health and safety representatives should be involved in the choice of PPE such as breathing masks and should ensure it is suitable for all workers
- make sure any PPE is properly maintained.

Further information

The HSE website has guidance on a range of dusts and sectors. Use the search box.

www.hse.gov.uk

COSHH Essentials – an invaluable tool for controlling dangerous substances.

www.hse.gov.uk/coshh/essentials

TUC website

www.tuc.org.uk

TUC/HSE Safety Representatives Asbestos Guide

www.tuc.org.uk/extras/asbestosguide.pdf

TUC Cancer guide

www.tuc.org.uk/extras/occupationalcancer.pdf

ACTS statement on Interim Dust standard

<http://www.tuc.org.uk/workplace/tuc-19971-f0.cfm>

IOM statement on dust

www.iom-world.org/pubs/IOMs_position_on_OELs.pdf