

CONTROLLING HEALTH HAZARDS FROM WOOL PROCESS DUST

Textiles Information Sheet No. 9

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Introduction

This information sheet gives advice to employers and all who work with wool on controlling the health risks from exposure to process dusts.

Wool dust is a substance hazardous to health as defined in Control of Substances Hazardous to Health Regulations (COSHH) 2002.

Effect on Health

The illnesses suffered by those exposed to wool dust are not clear-cut. People can suffer from chronic bronchitis, breathlessness, persistent rhinitis (runny or stuffy nose), and persistent conjunctivitis (itchy or sore eyes). The chances of suffering from ill health increase with the number of years you are exposed and with the amount of dust you are exposed to.

There doesn't seem to be a link with any particular part of wool processing.

It is not known what it is about the dust that causes ill health.

Maximum Exposure Limit

Wool process dust has a maximum exposure limit (MEL) of 10 mg/m^3 . A MEL is the maximum concentration of airborne dust, averaged over an 8-hour reference period, to which employees may be exposed. Personal exposure is measured, say over a shift, and then averaged for 8 hours (8-hour time weighted average TWA). It is not enough to keep within the MEL; the Control of Substances Hazardous to Health Regulations 2002 require exposure to dust to be reduced as far as reasonably practicable below the MEL.

The MEL applies to wool process dust from:

Carpet manufacture: up to the finished product;

Other wool processing: up to and including weaving, knitting or non-woven cloth production.

The limit does not apply to 'speciality fibres' such as goat hair.

Assessing Exposure

If little airborne dust is highlighted in a strong shaft of light, and only light layers of dust gather on surfaces over time, further measurement of exposure is probably unnecessary. Effort should be put into maintaining these low levels.

In many cases, measurement of airborne dust will be needed to establish personal exposure of different workers, including those who carry out maintenance and cleaning. This information can then be used to decide how to reduce the exposure and what extra control measures are needed.

In order to decide how to reduce dust levels you may need to find out where the dust is being generated. A dust lamp (a special lamp with a strong beam) can be used to highlight this.

Controlling Exposure

Ventilation issues:

- enclose machinery as much as possible and use local exhaust ventilation (LEV) to control dust escaping from essential openings.
- ensure good general ventilation to prevent build up of high background dust levels.
- remove workers from close contact with the process, eg by removing the need to enter blending bins.

Handling of materials:

- Handling of raw materials (eg, carrying, dropping, throwing or pulling from bales) causes high exposure, so should be minimised by changes to working practices. The in-flowing air at a vacuum conveyor or LEV

provided at the feed point of opening machines will not significantly reduce the exposure of the person feeding the material manually. Where automation or additional LEV cannot be used to control exposure, RPE should be worn as an additional control measure.

Cleaning:

- clean machinery by vacuuming, preferably using a piped system, but if a vacuum cleaner is used it should be fitted with a type H filter. Cleaning should not be done by 'flapping down' with cardboard, by using compressed air, or brushing, because these methods just re-disperse settled dust into the atmosphere.
- vacuum dust from machines before maintenance is carried out. (Maintenance employees are often exposed to high levels of dust because they work on machines with the covers removed, disturbing settled dust and with no LEV. RPE may be needed.)
- Do not rely on travelling push-pull cleaning systems on spinning and winding processes to reduce dust exposure; these are intended to increase the quality of the yarn by blowing dust off and vacuuming it up at ground level. Their effect on dust levels in the atmosphere is variable, and can even increase them.

Dust collection systems:

- Filters under positive pressure (blown filters) in dust collection systems should be enclosed or located in a separate filter room because any leak in the filter will cause dust to be blown into the workroom.
- If air from a dust collection system is recycled to the workroom, it may have to be filtered again so that it does not significantly add to the dust levels in the workroom. (Specialist advice should be taken on the best method.)
- Unless the dust collection system is fitted with rotary valves to allow it to be emptied while running, it should be emptied with the system switched off, using a system which prevents dust being released, eg by using a disposable bag in the collector bin. (Emptying dust collectors can be a very dusty task and respiratory protective equipment (RPE) should be worn if the dust is not adequately controlled.)

- Keep dust collectors well maintained and empty filter systems regularly to prevent a dropping-off in their performance. Emptying overloaded filters is a more difficult and dustier task.

Control Measures for Specific Processes

Opening (willeying)

- All opening machinery should be enclosed, with LEV, where necessary, at essential openings.
- RPE may be needed by employees who feed material from bales by hand, but handling of raw material should be minimised.
- Efficient removal of fibre from the air of pneumatic conveyors is required before it is vented.

Blending

- High dust exposures arise from traditional manually emptied blending bins. Vacuum systems in bins do not adequately control the dust, so RPE is essential. The best solution is to use automated bin emptying.
- Prevent the build-up of dust on bin roofs. This can be done by providing a canopy over the perforated ceiling which exhausts to a dust filtration system.

Carding

- Dust emission varies with blend and with the speed of the machine. It can be reduced by close fitting covers at those parts of the machine throwing off dust, and with LEV. (Covers should be in addition to perimeter fencing.)
- RPE may be required for operations such as manual fettling and other cleaning tasks. Consider providing vacuum fettling systems if possible.

Backwinding in carpet yarn production

- This process can produce high exposures. A number of approaches may be needed to reduce exposure.
- When purchasing new or reconditioned machinery, choose designs that generate less dust.

- LEV systems can be designed to pull the air away from the operator. It is essential to position the extraction as close to the machine as possible.
- Avoid excessive drying as this appears to be a significant factor in the amount of dust created.
- Identify batches of yarns which are more dusty and process on those machines equipped with engineering controls. Failing that, segregate the machine or do the work on a particular shift, to reduce the numbers of employees exposed and use RPE.

Choosing Respiratory Protective Equipment (RPE)

- RPE should only be used when the dust levels have been reduced as far as reasonably practicable by other methods.
- If it must be worn, the choice will usually be between disposable (FFP) masks, half-mask respirators, or powered visor respirators. Each type has its merits but powered visor respirators have the advantages of higher protection (on some models), integral hard-hat (if needed), no need to fit the face (a particular benefit if the wearer is not clean shaven or has a beard) and offers greater comfort over longer periods.
- Users should choose RPE that will theoretically protect at levels of dust several times higher than those expected. As a guide, it will almost always be reasonably practicable to provide protection to at least 10 x MEL. This can be achieved with FFP2 respirators, P2 filters in half-mask respirators or with powered visor respirators.

Maintaining Control Measures

- Engineering controls deteriorate over time and need to have a regular visual check for wear and damage.
- LEV plant is required by COSHH to be examined and tested at least every 14 months. Records should be kept for 5 years.
- The user should inspect RPE each time it is used. Non-disposable equipment should be thoroughly examined, and repaired and tested if needed in accordance with manufacturers' instructions, at least once every month.

Health Surveillance

Employers are required under Regulation 11 of the Control of Substances Hazardous to Health Regulations 2002 (“COSHH”) to carry out health surveillance where it is appropriate for the protection of employees’ health. The need for health surveillance should be determined by the assessment required by the Regulations. The health risks arising from exposure to wool process dust mean that health surveillance should be considered for employees who are significantly exposed.

Health surveillance allows protection of the worker by ensuring that those who develop problems are adequately assessed and counselled about the implications of continued exposure. Additionally, health surveillance gives the employer feedback about the adequacy of control measures.

A minimum legal requirement for health surveillance is as follows:

- Employers need to consider whether certain employees with pre-existing health problems are fit to be exposed to wool process dust. Wherever an employee gives a history of pre-existing respiratory disease e.g asthma, chronic bronchitis, they should have a further assessment made by an occupational health nurse or doctor. HSE’s Employment Medical Advisory Service (EMAS) are able to advise on these types of case.
- Employees should have received adequate information and training regarding the health effects of exposure to wool process dust, as required by regulation 12 of COSHH. They should therefore be aware of the need to report respiratory problems should they occur. If individuals report problems the employer should review control measures for the particular employee and similarly exposed colleagues. In some cases retraining or special protection for the individual may be sufficient but in many cases control measures such as ventilation, working practices or cleaning will need to be re-assessed to demonstrate that control is adequate. Employees and their representatives should be consulted on any changes required and the reasons for them. The employee should be referred to an occupational health nurse or doctor for further assessment, and advice on the risks of continuing exposure.

- Employers must ensure that they keep “health records” as required by COSHH regulation 11, for employees receiving health surveillance.
- In conducting pre-employment and/ or pre-placement medical assessments employers need to be aware of their duties under The Disability Discrimination Act 1996, whereby rejection from employment of an employee which cannot be justified puts the employer in breach of the Act. By ensuring that competent occupational health advice is used employers should prevent a breach from occurring.
- A ‘best practice’ approach to health surveillance for wool process dust would include pre-employment health assessment by an occupational health doctor or nurse followed by ongoing health assessment on a routine basis.
- Fuller guidance on health surveillance is available in HSE publication *HSG61: Health Surveillance at Work*. HSE’s Employment Medical Advisory Service (EMAS) can also give general advice to employers regarding pre-employment/ pre-placement health assessments and health surveillance.

Information, Instruction, and Training

In addition to information about the health effects of the dust they are exposed to, workers should know about the control measures the company has in place, how to use them and how to report defects.

Workers who have to wear RPE need to know the limitations of the protection it gives them, how to check it for defects, how to wear it properly and to check that it fits. They should also know how often to replace filters and how to get the equipment maintained and repaired.

References

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