Wood dust:
A hazard encountered by many workers

Wood dust facts and figures

- Carpenters and joiners are four times more likely to suffer from asthma than the UK population as a whole
- Wood dust can contain bacteria, and the spores of fungi and moss
- Wood dust has been on the USA's National Institute of Health's list of 200 materials and chemicals likely to cause cancer since 2002

Medical problems associated with wood dust

- Skin irritation
- Allergic contact dermatitis
- Rhinitis
- Nasal cancer
- Stomach cancer
- Asthma
- Lung function impairment
- Extrinsic allergic alveolitis
- Conjunctivitis
- Hodgkin's Lymphoma

The dangers of wood dust

Wood was probably the first material to be used and shaped by humans. As a 'natural' product itcould be perceived as less harmful than man-made materials, but this would be a mistake.

Some types of wood are in themselves poisonous. Here in Britain we are familiar with the toxicity of yew and laburnum; in Australia, people are equally wary of milky mangrove. The occupational risks of wood, though, come about when it is sawn or sanded, creating dust in the process.

Wood dust is flammable and can cause a fire or even explosion. Although explosions are rare, they can be devastating; four people were killed in 2015 when wood dust ignited at Bosley Mill near Macclesfield. On a more day-to-day level, it is all too easy to slip on dust lying on the floor. However, the hazard most commonly presented by wood dust arises from prolonged exposure to itin the working environment, which can lead to a range of health problems, from allergies to cancer.

Site workers are most at risk

Although workshops are where the highest densities of wood dust are found, their permanent set-ups generally include fixed dust extraction and control equipment. It is construction carpenters who are exposed to the widest range of dust because of the different locations and conditions they work in.

The type of wood affects the degree of risk

The hazards arising from wood dust will vary according to the type of wood being used. Composite materials, such as MDF and plywood, comprise a mixture of hardwoods and softwoods but present an additional potential risk from the bonding materials used in their construction and their formaldehyde content. Formaldehyde is linked to cancer and board manufactured within the EU must conform to strict controls on the amounts present. Board sourced from outside the UK may well contain higher levels and warrant greater precautions. The workplace exposure limits for formaldehyde are 2.5 mg/m3 or 2 ppm for both the long-term (8-hour) exposure limit and the short-term (15 minute) exposure limits. The HSE produce a detailed guide (see 'Further information' on page 3) to the toxicity and health impacts of different types of natural wood. The following table is a brief summary of the most commonly encountered woods and the most closely associated medical effect of exposure to their dust.

Medical consequences	Wood types most associated		
Decrease in lung function or asthma	Alder Ash Boxwood Douglas fir Ebony	Iroko Mahogany Maple Oak Obeche	Pine Rosewood SpruceTeak Western red
Rhinitis (runny nose) and irritation of the mucous membranes	Alder Beech Cedars Douglas fir	Ebony Hemlock Mahogany Oak	Obeche Poplar Sapele Walnut
Cancer	Hardwoods, in particular beech and oak		
Skin disorders	Birch Cedars Douglas fir Ebony	Iroko Larch Mahogany Obeche Pine	Rosewood Sapele Spruce Teak
Poisoning	Box Greenheart	Laburnum	Yew

Impact of particle size

Wood dust is made up of particles of widely varying sizes. Most of its weight is made up of visible particles, but the health risks are mainly from the other particles that are too small to see. Those between diameters of 1 and 10 microns (by comparison, human hair is typically 70 microns, or 0.07 mm, in diameter) can remain suspended in the air for some time, where they are easily inhaled or ingested if no preventive measures are used.

In the UK, both hardwood and softwood dusts have a Workplace Exposure Limit (WEL) of 5mg/m3 averaged over an eight-hour working day. Unfortunately, this average limit does not completely reflect how wood dust risks arise: by their nature, the activities that generate wood dust produce large amounts of dust over short spells, creating harmful concentrations which then disperse fairly quickly (although the smallest, most dangerous, particles remain airborne for longest).

Controlling wood dust

Although PPE in the form of face masks and filters can help, they rely on correct fitting and protect only the workers wearing them. The main method of control recommended is dust extraction, also known as local exhaust ventilation or LEV, as close to the process generating the dust as possible.

Where equipment is fixed in one location, such as a lathe within a workshop, the LEV should be provided by permanent dust extraction equipment. For it to work effectively, and to minimise the possibility of dust explosion, all such equipment (including filters) should be kept clean and properly maintained. Dust extraction equipment should be checked by a competent person once a year – it must be done by law at intervals of no more than 14 months.

Legal controls

The elimination/control of wood dust risks is legally governed by:

- The Health and Safety at Work Act 1974
- The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)
- The Control of Substances Hazardous to Health (COSHH) Regulations 2002.

Further information

The HSE publish a wealth of information about the hazards of working with wood.

Wood dust: What you need to know and do

Wood dust: Controlling the risks

Toxic woods

COSHH and woodworkers - key messages

Other sources

Breathe Freely
www.breathefreely.org.uk

The Wood Database
Wood Dust Safety

Controlling wood dust Cont.

The same principle of deploying extraction equipment close to the sources of dust also applies to equipment used in a temporary setting, such as on construction sites. As ever, its effectiveness will depend on how it is set up and maintained. Ducting should be of a diameter wide enough to handle the amount of dust generated, without any kinks or choke points that could inhibit airflow. Hoods and ducts should be regularly inspected for blockages.

Equipment collecting dust should be left running for some time after the last dust-making activity to enable it to gather in as many as possible of the particles that remain suspended in the air.

Whether working in a permanent or temporary setting, cleaning away wood dust from equipment or clothing should NOT be done by sweeping, brushing or using compressed air lines; these may cause high peaks of dust exposure which will only increase the likelihood of dust being inhaled. Instead an industrial vacuum cleaner holding a class M classification should be used.