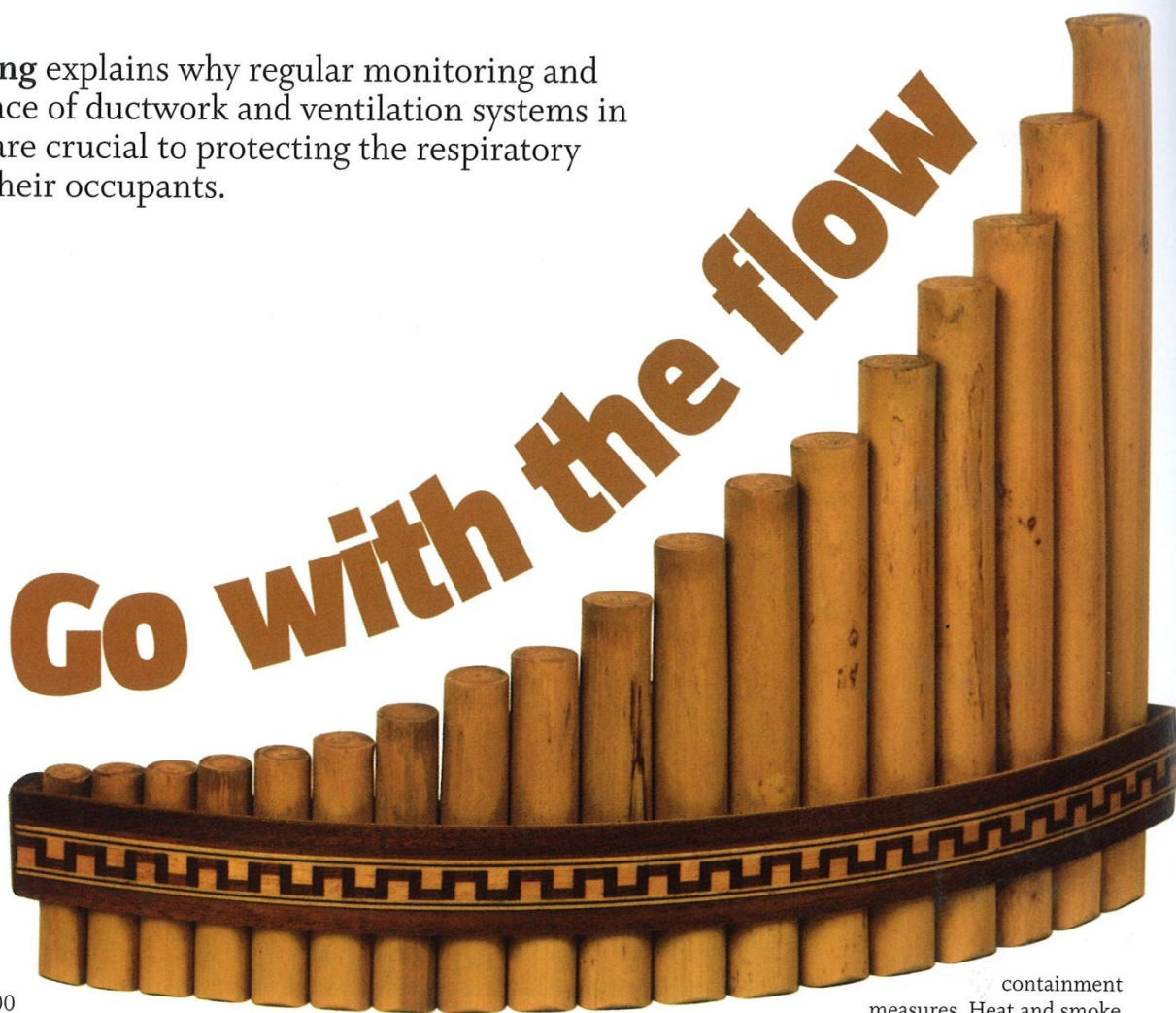


Darren Ling explains why regular monitoring and maintenance of ductwork and ventilation systems in buildings are crucial to protecting the respiratory health of their occupants.



OCCUPATIONAL exposures to fumes, dusts and chemicals together account for around 4000 deaths a year,¹ while some 38,000

individuals suffer breathing or lung problems that they believe are caused by their work.² Asthma, bronchitis, allergic rhinitis, emphysema and mesothelioma are just some of the serious – and, in some cases, fatal – conditions that can develop as a result of exposure to respiratory hazards.

But such hazards are not just a concern in industrial workplaces; dusts, fumes and pathogens can build up in any situation where they are left unchecked. Dirty ventilation systems can seriously affect staff well-being and working environments, and legislation and best-practice guidelines clearly put the onus for cleaning maintenance on building owners, landlords and managing agents.^{3,4,5} Adopting an ‘out of sight, out of mind’ mentality when it comes to the air we breathe and the hidden-away systems that control and contribute to it isn’t an option.

Even in so-called “low-risk” indoor workplaces, like shops, offices, and schools, these contaminants are present. Ventilation systems provide the perfect breeding ground so it is vital to keep heating, ventilation and air-conditioning (HVAC) ductwork systems clean to avoid the accumulation of dust, dirt

and potentially harmful bacteria.

For example, MRSA and *Clostridium difficile* are constantly in the news these days but they are not exclusive to medical environments, and are not only spread through touch. Both bacteria have been found in duct systems, blowing around the building and spreading far and wide.

Gases can also be present in indoor working environments. Ozone, for example, is commonly found where photocopying takes place. There is an occupational exposure limit (OEL) for ozone, as it can irritate the eyes and upper respiratory tract. An excess of carbon dioxide can cause people to feel lethargic and suffer headaches. Typically, it builds up as a result of poor airflow around a building, which can be caused by a ventilation system that is blocked by dust and dirt either on the incoming air side or the extract side. Again, the solution is simple: regular testing, surveying and cleaning.⁵

Poorly maintained extract ductwork also poses a very real fire risk. Within a ventilation system, there are fire dampers – shutters built into the system as fire

containment measures. Heat and smoke travelling down the system will trigger a mechanical stop to release the shutter and prevent the fire spreading; if these shutters are clogged with dirt, dust and grease, they may not work properly.

It is therefore essential to check these systems regularly as part of a fire maintenance regime. The Regulatory Reform (Fire Safety) Order 2005 states that all fire dampers should be tested at regular intervals not exceeding two years, spring-operated fire dampers should be tested annually, and fire dampers in dust-laden and similar atmospheres should be tested more frequently. It also puts the duty of care on the building owner to minimise the fire risks by maintaining the ductwork properly.

A growing problem

And it is not just the pipework in a building that can cause problems – the condition of the premises can also be a factor. Take this example of an employee in an office, who suffered from asthma. His condition deteriorated and eventually became so severe that he had to be signed off work.

Upon investigation, it was discovered that rainwater had leaked into the building

over a prolonged period and this, combined with shabby housekeeping of the premises, led to extensive growth of mould. Three types of organisms were found in abundance: *cladosporium*, *stachybotrys* and *rhyzopus*. *Cladosporium* can cause infections of the skin and nails, as well as sinusitis and pulmonary infections. *Stachybotrys* can cause cold and flu-like symptoms, including sore throats and headaches. But the most worrying is *rhyzopus*, which can cause fungal infections and can even be fatal to humans.

The unsanitary working conditions in this case arose primarily because routine building maintenance and housekeeping were not carried out by the duty-holder. The building's leaky roof contributed to the apparent damp and mould growth and, while repairing it will help prevent the damp getting any worse, fixing the damage caused by mould growth will be a considerably bigger and more costly job.

The cost of ignorance

If the risks of illness, fire and death are not motivation enough, there are also possible financial repercussions. Failing to maintain any system is not cost-effective in the long run. Build-up of harmful deposits in ventilation systems can impair their performance, thus making them more expensive to run. The aforementioned health effects on employees will also likely result in a loss of productivity due to under-performance and sickness absence.

As regular maintenance and cleaning of extraction systems are usually conditions of insurance policies, insurers can and will refuse to pay claims in cases where contamination, or a fire, was due to lack of maintenance of ductwork.

Summary

In the current economic climate, building-owners and duty-holders must not be tempted to try to save money by neglecting their ductwork and ventilation systems. As clearly outlined in industry guidance,⁵ carrying out regular inspections and recommissioning at intervals no greater than 14 months will satisfy the regulator and insurance companies that the right steps have been taken to properly clean extraction and ventilation systems so as to minimise the risks to employees' respiratory health, and guard against fire. ■

References

- 1 www.hse.gov.uk/statistics/causdis/copd/index.htm
- 2 www.hse.gov.uk/statistics/causdis/asthma/index.htm

- 3 HSE (2000): *General ventilation in the workplace: Guidance for employers* (HSG202), HSE Books, ISBN 0 7176 1793 9
- 4 Regulation 5 of The Workplace (Health, Safety and Welfare) Regulations 1992 states that mechanical ventilation systems, including air-conditioning systems, should be regularly cleaned, tested and maintained to ensure that

- 5 See The Heating and Ventilating Contractors' Association's (HVCA) *Guide to Good Practice – Internal Cleanliness of Ventilation Systems TR/19* – www.hvacpublications.co.uk

Darren Ling is a director of System Hygienics – see page 4 for more information

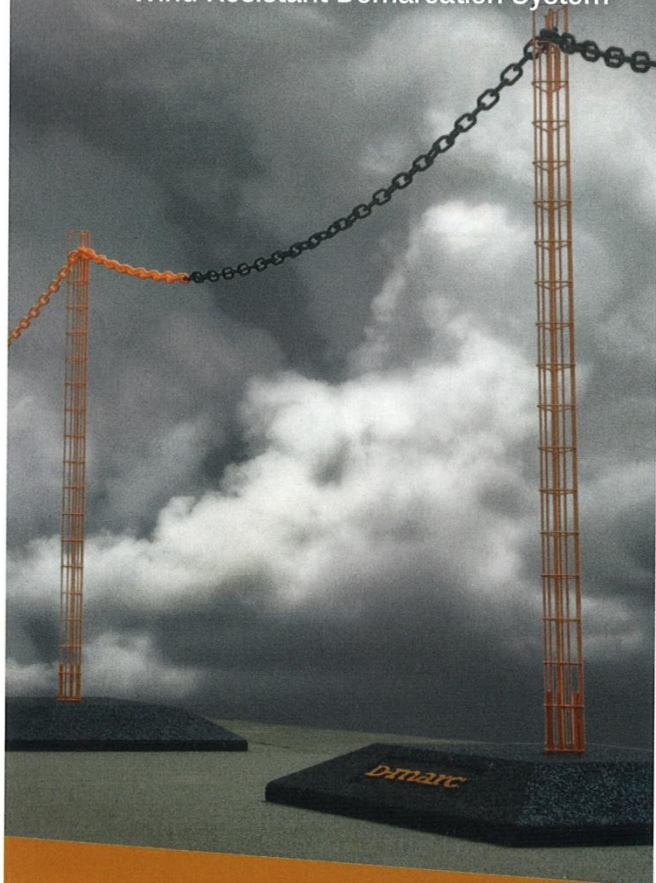


The picture above shows ventilation ductwork before cleaning, while the picture below was taken post-clean. Accumulation of dust and moisture within HVAC systems increases the risk for the spread of airborne pathogens, so regular cleaning and maintenance should be carried out to guard against this



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CONTRIBUTORS

Nigel Bryson

Grass-roots appeal

Nigel worked in trades-union health and safety for 22 years before setting up his own consultancy. He was national health and safety officer for the Bakers, Food and Allied Workers' Union from 1981 to 1992, after which he became director of health and environment for the GMB. Nigel has been awarded the RoSPA Distinguished Service Award for his 'outstanding contribution to the cause of health and safety at work', and an OBE for services to occupational health and safety. He has recently published a book entitled *Zero harm: Worker involvement – the missing piece!* To find out more, visit www.workerinvolvement.co.uk



Dr Mark Piney

Local hero

Mark is an occupational hygienist of 33 years' experience, 22 of them spent working for HSE. He managed the HSE's national LEV Project, which included the new LEV guidance. As Piney Consulting Ltd he specialises in exposure control.



End of the line

Peter Rimmer

Peter is a freelance writer, photographer and communications consultant who worked for 16 years as director of communications with the HSE, until the end of 2003. He is an assessor for the Corporate Health Standard in Wales, coordinates the Napo series of animated films, and worked part-time at the European Agency for Safety and Health at Work as campaign manager for Safe Start and Lighten the Load. He chairs the juries for the EU-OSHA photo competition and the International Film Festival of the ISSA/ILO World Congress.



Graham Greaves

Pry before you buy

Graham started his career in Leeds City Council's Health and Safety Unit before progressing into the private sector, where he held a range of senior occupational health and safety roles in a variety of sectors, including FMCG, pharmaceuticals, agriculture, health care, education and leisure. Now director of health and safety services at Ellis Whittam, Graham is a chartered fellow of the CIPD and a fellow of the Royal Society for Public Health. He is also a member of IOSH, IEMA and IIRSM.



REGULAR CONTRIBUTORS

Michael Appleby

Dreamspace: the closing chapter

Michael is a partner in the London office of law firm Housemans, specialising in health and safety.



Darren Ling

Go with the flow

Darren Ling is a director of air-hygiene specialist, System Hygienics, which provides ventilation and extract-duct cleaning services, cleanliness surveys and risk assessments, fire-damper testing, and industrial and technical cleaning services – visit www.systemhygienics.co.uk



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