FM World
14 August 2014

COMMENT

Richard Norman, chairman of the Building and Engineering Services Association

INDOOR AIR

Poor air quality can seriously damage your business health, warns Richard Norman, of the Building and Engineering Services Association's ventilation hygiene sector

In April the threat of air pollution was blown into the public consciousness by a wind from the Sahara that gathered up industrial pollution from Europe and mixed it with local pollution.

Pollution alerts were given alongside weather forecasts, highlighting health warnings for those with lung and heart conditions, asthma sufferers and the elderly. Now it has all quite literally blown over.

But the irony is that the indoor air quality in workplaces may be far worse than what was experienced back in April.

We may be able to cope with a few days of outdoor pollution, but office workers can't escape 'bad air' that will impact on their health and productivity, day in day out, perhaps for years.

To ensure that air is clean, ductwork must be cleaned thoroughly in its entirety, with grilles and filters regularly checked and air quality monitored. And it is essential that a qualified company do monitoring and cleaning to the required industry standards.

The Workplace (Health, Safety & Welfare) Regulations require building owners and managers to ensure that enclosed workplaces are ventilated with fresh and purified air and that, where this is provided by a mechanical ductwork system, it is regularly maintained, inspected and cleaned and that a record is kept to support this compliance.

According to the B&ES *Guide To Good Practice TR/19 – Cleanliness Of Ventilation Systems*, the limits of dirt and contamination above which cleaning is recommended are: for supply/recirculation systems – 60µm [micrometres]; extract systems – 180µm; kitchen grease extract systems – 200µm as a mean across the system, or 500µm in any single measurement.

The finger test

The Health & Safety Executive's *HSG 202, General Ventilation In The Workplace Guidance For Employers* says: "As a general rule, if you run your finger along the opening of a duct and it collects dust then it probably needs cleaning".

The first step is monitoring. Air quality testing can involve testing filtration effectiveness, surface and airborne microbial sampling, measurements of temperature, relative humidity, CO and CO2 and airborne particulate, ozone, or formaldehyde sampling.

Findings should then be benchmarked against HSE standards. The resulting data will enable building management to meet its duty to provide COSHH and General Risk Assessments as required under Health & Safety legislation.

If ductwork cleaning is required, the updated (second edition) *Building And Engineering Services Association Guide To Good Practice – Internal Cleanliness Of Ventilation Systems* (TR/19) provides guidance on air quality and ventilation ducting pre-clean testing methods.

The British and European Standard BS EN 15780 introduces a new preferred vacuum test (PVT) in its test guidance notes, designed to measure the total amount of dust deposited in a duct. The UK industry, through TR/19, has historically used deposit thickness testing (DTT) to give a similar measurement of total dust accumulation when evaluating duct cleanliness before cleaning, and the vacuum test (VT) to validate cleanliness after duct cleaning.

Until now, neither document provided a comparison of PVT values (measured in grams) and DTT (measured in microns). TR/19 second edition now includes a reference table that does this so that practitioners using the DTT method can easily check that they are compliant with the requirements of BS EN 15780 when determining if a system needs to be cleaned, without the need to wait for laboratory analysis of the test filters (DTT giving an instant on-site test result). For post-clean validation, both BS EN 15780 and the new TR/19 specify the PVT as the only test method.

And BS EN 15780 defines buildings by classifications – 'cleanliness quality classes', which set different benchmarks for the amount of soiling in a duct, based on the type and use of that building or area. TR/19 includes a table showing typical applications of cleanliness quality.

Particles in the air we breathe vary greatly. The greatest health hazard from particles comes from those less than 10 microns (10 µm or 10 micrometres) across, as we can easily inhale them. Studies in the US and Europe show a correlation between levels of airborne particles and the number of people who die each year.

Poor indoor air quality is believed to have an aggravating influence on allergic symptoms, chronic obstructive pulmonary disease, airborne respiratory infections, and cardiovascular disease. Building dampness and mould has been associated with a 30-50 per cent increase in a variety of respiratory and asthma-related health outcomes.

Breath of fresh air

Poor air quality can affect employee concentration, low energy levels and wellbeing, and may lead to an increase in sick days. Research has shown that the size of the effect of poor air quality on most aspects of office work performance appears to be as high as 6-9 per cent.

Derek J Clements-Croome, Professor of Construction Engineering at Reading university, says: "It is a much higher cost to employ people than it is to maintain and operate a building, so spending money on improving the work environment is the most cost-effective way of improving productivity. Premises costs for maintenance, energy, cleaning and administration are only about 5 per cent of staff costs."

Absenteeism costs the UK economy £12 billion every year. Much of this absence will be caused or exacerbated by poor indoor air quality. Fighting pollution from the inside will improve not only the health and performance of your employees, but your business too. FM