



THE IMPORTANCE OF READING THE ROOM

Managing the threat of dust in **EVERY workplace.**

How new dust detection technology helps H&S professionals apply the hierarchy of controls.



CONTENTS

- 4** > From safety to health
- 5** > From traditional heavy industrial workplaces to all workplaces
- 6** > We've only just begun
- 7** > The financial cost of failure
- 7** > The human cost of failure
- 8** > Recognising a wider range of dust danger
- 11** > Hopes dashed
- 12** > The hierarchy of controls
- 14** > Using measurement to mitigate the dangers of workplace dust, in real-time
- 15** > New personal dust detection devices
- 16** > Wearable dust detection that meets the 3 essential equipment adoption criteria
- 18** > Conclusion

**“He who has health,
has hope; and he
who has hope,
has everything.”**

Thomas Carlyle

FROM SAFETY TO HEALTH

Employers and the health and safety community are shifting their attention.

Where they've traditionally focused on safety, they now look at the major impacts on long-term health associated with working in hazardous environments.

It's a shift seen in our Changing Emphasis from Workplace Safety to Health ebook, and the HSE's 2016 Helping Great Britain work well strategy:

"Work-related ill health is a problem for every section of society, with conditions ranging from cancer and other long-latency diseases, to stress and musculoskeletal disorders. Greater awareness of the harm, costs and preventability of work-related ill health should drive collective action to improve health outcomes."



FROM TRADITIONAL HEAVY INDUSTRIAL WORKPLACES TO **ALL WORKPLACES**

There's also an increasing awareness of the range of industries that can present long-term health hazards through the inhalation of dangerous dust particles.

Whereas longer-term respiratory health threats were once seen as mainly a problem for industries such as mining and tunneling, we're now seeing a greater recognition of the dangers in lighter industries and other commercial activities such as motor vehicle repair, construction and even nail bars or offices using thermoplastic toner.

Sectors where the health risks of dust were never appreciated or even considered are now beginning to wake up to the threat.



WE'VE ONLY JUST BEGUN

The HSE are reporting an estimated 1.4 million people in the UK reporting 'lung or breathing problems that were caused or made worse by work,' and Construction Dust Partnership claim 12,000 UK deaths a year due to occupational lung disease (a figure that rockets to more than half a million deaths worldwide every year as a direct consequence of hazardous dust).

So while it's great that people are starting to pay attention, there's plenty of room for improvement.

In this ebook we explain how the arrival of affordable, real-time monitoring technologies promotes this new awareness of the dangers of dust in a far broader range of working environments.

And by understanding the threat at hand, we can apply the hierarchy of controls used by H&S professionals to help employers maintain the health of their employees in the long run.



THE FINANCIAL COST OF FAILURE

Lung disease is the 4th most costly disease in the UK, after mental health conditions, musculoskeletal diseases and heart disease, and costs the UK more than £10billion every year in health costs and £1.2billion in 6 million lost working days.

THE HUMAN COST OF FAILURE

**Respiratory illness is more than an economic drain.
It's a personal tragedy.**

While a lot of work has gone into helping people to improve their future health outcomes (for example, the construction industry's 'ban the broom' dust suppression initiative aimed at reducing the estimated 500 construction industry deaths a year caused by windblown dust), once the damage is done, there's no going back.

As leading UK Health and Safety expert John Cains explains,

"Take Crystalline Silica as an example, it irreparably scars the lungs and prevents them expanding enough to get a breath to oxidate the blood sufficiently. Damage creep so subtle you might not even be aware of it until it becomes irreversible."

RECOGNISING A WIDER RANGE OF DUST DANGER

Dust-related illnesses aren't just a legacy of mining and heavy industry. There are a whole raft of occupations and jobs where people are exposed to dangerous dust from the largest of manufacturers, to motor repair, sanding and welding, to hairdressers and nail salons. All of which are dangerous over long periods.

Potentially lethal dust is everywhere - from construction dust, to the fibreglass/Glass Reinforced Plastics (GRP) used in loft insulation, and 3D printing that fuses layers and layers of extremely fine dust to create the final shape.

There's coffee dust, soldering fumes (20% of people soldering or working around solder develop asthma), carbon fibre and plaster related lime, sulphate hemihydrates, silica, and mica dust that leads to asthma, COPD, chronic bronchitis, and emphysema.

There's cement dust, plus the ubiquitous Amorphous Silica used in car tires, agri chemicals and animal feed, in toothpaste and cosmetics, paint, insulation materials, adhesives, coatings, and printer ink.

There's biomass dust, dust created by waste disposal and recycling, sawmill wood dust, dust in nail bars, chiropodists, and podiatry clinics, tool sharpening dust and MDF dust particles coated in formaldehyde.

And it's been more than 20 years since Roy Lockett, deputy general secretary of Bectu, said at a TUC Conference:

***'MDF is the asbestos of the Nineties.
It is carcinogenic. It causes lesions.
It damages the eyes, the skin, the lungs
and the heart. It is vile and pernicious,'***

but the potential threat remains.

The list goes on - dust from bakeries and mills, agriculture, foundries, coke ovens, oil and gas, textiles and laundry, quarrying, hairdressing. Dust is ever-present.

It poses a particular challenge for blue light services.

When firefighters are in a building tackling a blaze, they're in a toxic soup of carbon based carcinogenic gasses and while they're protected by wearing breathing apparatus, their clothing is getting covered in soot.

But who knows what's being liberated when they remove their breathing apparatus? And what about other firefighters, those manning the pumping machinery or helping clean up? They could easily be breathing these invisible particles and introducing toxic materials into their bodies?

HOPES DASHED

We're surrounded, says John Cairns by *"materials that can get into your lungs and over a period of time cause damage that will dramatically affect your quality of life. Not just yours, but your friends and family too. Damage isn't just physical it's mental and emotional, it's wellbeing."*

You've been working for 30 or 40 years and looking forward to your retirement, you've got yourself a nice house, your grandkids and spending time with your partner, looking forward to long and luxurious holidays, winding down and enjoying your well deserved retirement - and you end up sitting in a chair looking out of the window wearing an oxygen cylinder, and you're not going anywhere."

But there is a light at the end of the tunnel.
An end to the thousands of futures wrecked by workplace dust.
Because the damage, and all the distress that comes with it,
is totally preventable.

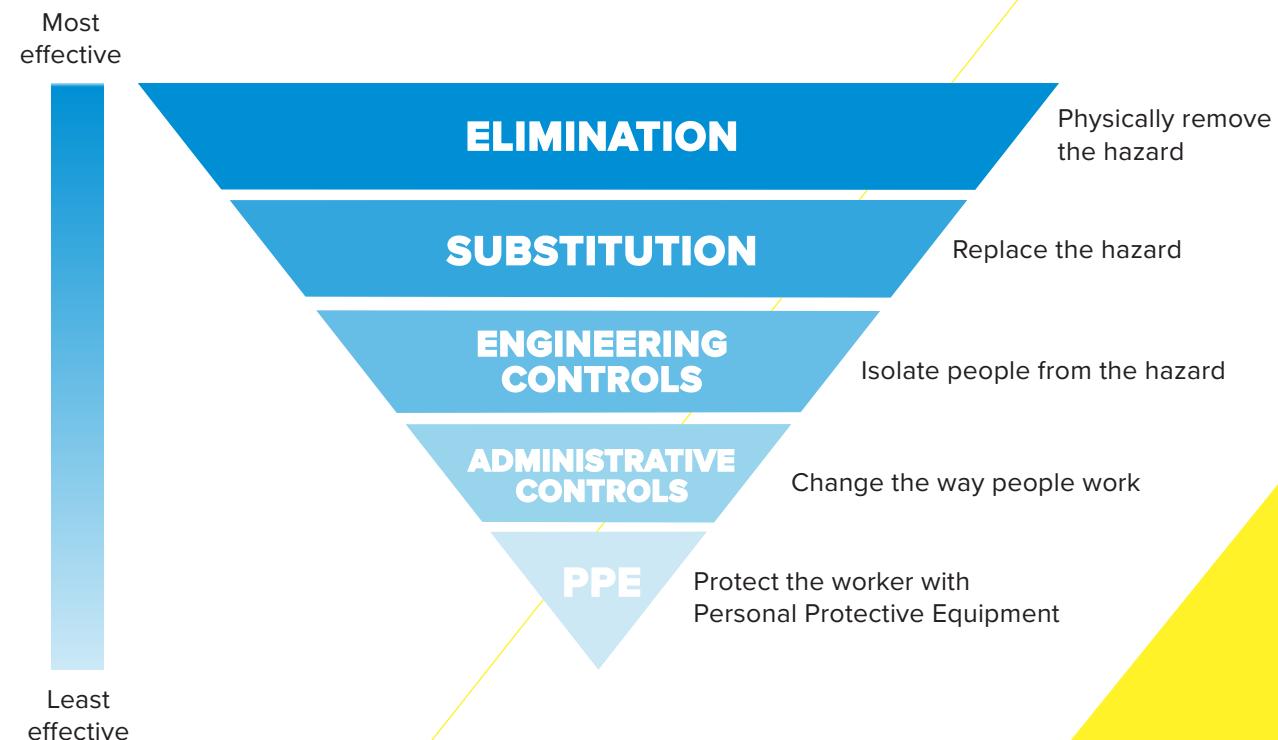
Risk can be controlled.



THE HIERARCHY OF CONTROLS

Knowing that dangerous dust exists, knowing its effects are potentially lethal, and knowing that the damage it causes is preventable, only takes you so far. Knowing how to prevent that harm is what matters.

As you'll probably know, the way that businesses and Health and Safety professionals usually tackle health and safety issues is through what they call The Hierarchy of Controls.



The Hierarchy of Controls is a clear, sensible, process of protection - when the threat is clearly visible.

The ‘ban the broom’ initiative as mentioned earlier is an example of an Administrative Control - changing the way that people work by encouraging them to suppress visible dust, usually with water, rather than stirring it up as they try to sweep it up.

The inherent difficulty with dust though is that with the most dangerous dust particles between 0.01 to 100 microns in size, you’re fighting an invisible enemy.

An invisible enemy that, below 10 microns, will penetrate deep into the lungs contributing to all manner of deadly diseases such as lung cancer, strokes, heart attacks, COPD, asthma and respiratory disease.

[**Clearly anything that can help apply the Hierarchy of Controls more effectively and either prevent workers coming into contact with such potentially dangerous dust or limit their contact time to safe levels has got to be a good thing.**](#)

USING MEASUREMENT TO MITIGATE THE DANGERS OF WORKPLACE DUST, IN REAL-TIME

Fortunately, new accurate, real-time, wearable, dust detection sensors are leading the detection charge across every use case. By precisely reading the real-time dust load in any given environment, and the enemy now ‘visible’, businesses can begin to apply the hierarchy of controls in a far more meaningful way.

1 ➤ Elimination

Elimination is the most effective - and preferred - way to control a risk because the deadly dust is no longer present.

2 ➤ Substitution

If it is not reasonably practicable to eliminate the hazards and associated risks, you must minimise the risks by substituting working methods and materials to create less dust.

3 ➤ Engineering

An engineering control is a control measure that is physical in nature and controls the hazard at its source - e.g. using local exhaust ventilation (LEV) or applying on-tool extraction - a suction nozzle suppression technique that removes the dust and retains it safely.

4 ➤ Admin

This can include developing other work practices to protect workers from hazards. Either by limiting the amount of time workers spend in dusty environments, or stopping them from working in dusty areas entirely.

5 ➤ PPE

If you know what you’re dealing with and the airborne concentration, you can provide suitably selected and fit tested respiratory protective equipment (RPE) to prevent workers inhaling dust.

[For more detailed guidance on how a more accurate understanding of the dust threat faced can inform the different levels of the HoC model, the Clean air? take care! | BSIF campaign is a joint initiative between the BSIF and the Health & Safety Executive \(HSE\) aimed at reducing occupational respiratory disease.](#)

NEW PERSONAL DUST PROTECTION DEVICES

The concept of real-time monitoring is nothing new for Trolex. We have a long and successful history supplying advanced fixed location dust monitoring equipment to mining tunnelling and heavy industry.

But our new range of devices radically advances your personal ability to accurately 'read the room' for dangerous dust.

Wearable sensors designed to measure the wearers vital signs and the environment in which they're working. Live information that can be relayed to operational systems so that safety officers or managers can take appropriate action. Whether that's to issue safety equipment and/or put in place preventative measures.

Says John Cairns, "We haven't had that before, something that gives you an instant alert. If somebody's wearing the XD One and they're in an area where there's dust of respirable size and concentration they'll get an alarm. I've been in industries all my working life in areas where people would go into areas of danger where they might be dangerous gases around and you'd have personal gas monitors to alert you to dangerous concentrations. This is similar.

The best thing is to detect the hazard before you're exposed to the hazard. Before you're exposed to the hazard or a high concentration. You can get the hell out of there, or with the way this new technology works you can set off ventilation systems to clear the area.

The whole ethos behind the H&S Exec is to reduce the risk to as low as is reasonably practicable. I think the XD is adding to that - it's enhancing the safety system."

WEARABLE DUST DETECTION THAT MEETS THE 3 ESSENTIAL EQUIPMENT ADOPTION CRITERIA

There are three core criteria that determine whether new H&S equipment will fulfil its life saving potential:



1 ➤ It has to benefit the user and be suitable for use. People have to understand the risks and how the equipment will benefit, otherwise the kit won't be used.

By identifying the risks, the XD One makes it easy for workers to understand them. We all know dust presents a potential threat. Having the presence of dust made clear so that something can be done to mitigate it is a simple concept and benefit.

2 ➤ Satisfy health and safety operation requirements and not impede people doing their job.

The XD One doesn't interfere with day to day tasks. It's easy to use, simply wearable, low maintenance and durable.

No filters, no pump, no fiddly attachments and a maintenance cycle that requires just 60 seconds' work every six months, the XD One is also 5 times more accurate than other devices. An open-path sensing device that continuously measures every particle from 0.35 to 40µm, a dust load capability at least 10 times greater than other devices.

- 3> It has to be affordable and meet the economic requirement of the company - an investment not an expense.**

Not only does the XD One easily meet the first two equipment adoption criteria, because it's considerably better priced than other products it means it can be affordably deployed to anyone working in a potentially hazardous space - new life-saving dust detection technology now available for all rather than prioritised for a select few.



TOWARDS A SAFER FUTURE

New attitudes, new legislation and new technology are driving a new understanding of the dangers of dust, in even the most unlikely of workplaces. And with wellbeing high on the agenda there's never been a better time to take a step back and take a good hard look at ways that your business can protect your workers' health and protect your bottom line.

As mentioned earlier, more than just inflicting personal misery, the commercial implications of poor health are immense - not only to the individual and to the business, but to the whole community.

Time you had a proper understanding of the dust threat in your workplace? Time you had the information you need to mitigate preventable harm? To accurately apply your H&S Hierarchy of Controls?

Talk to us about our XD One wearable dust detection technology. After all, you only have One Life.

Protect It.

