Air quality on global agenda

The importance of effective industrial extraction

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Following the recent introduction of legislation aimed at reducing air pollution in both China and the USA, James Stansfield, Managing Director of UK based oil mist removal specialist, Filtermist, is highlighting how cleaning the air in industrial workplaces can contribute to the overall quality of external air - helping to safeguard both the environment, and the health of workers.

It is now widely understood around the World that a range of substances found in manufacturing environments can be extremely hazardous to human health – both through harm caused to the respiratory system and the potential to cause accidents such as slips, fires and damage to equipment.

In many countries these risks have been recognised relatively recently – even in the UK, COSHH (Control of Substances Hazardous to Health) regulations were only introduced in the late 1980s.

The UK Health and Safety Executive now requires all industrial workplaces to comply with COSHH to ensure the safety of workers and this approach is now being mirrored in other parts of the world.

Extraction systems to remove airborne particles from industrial workplaces have been in use for a number of years, but older models simply moved the problem rather than solving it – pollutants were extracted and exhausted outside instead of being removed altogether.

This fact, in addition to the volume of oil mist, fumes and dust that can escape through open doors and windows from facilities with no effective extraction system, can make a significant contribution to the high levels of atmospheric pollution still experienced in some countries around the World.

China

A recent Environmental Performance Index report produced by Yale highlighted the fact that global air quality is worsening. The report stated that in 2011, 1.8 billion people were exposed to poor air quality – up by more than 0.5 billion since 2000.

Some of the worst air quality was recorded in China and India which the report attributed to increasing industrialisation, high urbanisation and population growth. The 2014 EPI states,

'Particles smaller than 2.5 microns in diameter, known in shorthand as $PM_{2.5}$, are fine enough to lodge deep into human lung and blood tissue. They place exposed populations at risk of heart and lung diseases, ranging from stroke to lung cancer. In severe cases, they can lead to direct fatalities.'

Authorities in Beijing have recently introduced legislation aimed at curbing $PM_{2.5}$ pollution in an attempt to reduce the city's smog problem. Whilst a substantial amount of pollution is the result of vehicle emissions and burning solid fuel, a significant amount has been attributed to industrial plants.

Another report, issued by the Beijing-based Social Science Academic Press and the Shanghai Academy of Social Sciences last month, states that Beijing is 'barely suitable for living' due to its excessively high levels of air pollution. According to The Guardian, the Chinese government has stated it '*would set up a 10bn yuan (£990m) fund to fight air pollution, offering rewards for companies that clean-up operations.*

The article carries on to say, *'Overall the government has pledged to spend over 3tn yuan to tackle the problem, creating a growing market for companies that can help boost energy efficiency and lower emissions.*

Beijing will also shut 300 polluting factories this year and publish a list of industrial projects to be halted or suspended by the end of April, state news agency Xinhua said.'

North America

Air quality is also under the spotlight in North America, particularly in California where the South Coast Air Quality Management District (AQMD) is 'committed to protecting the health of residents, while remaining sensitive to businesses.'

The issue of pollution caused by industrial sources was brought into the public eye again late last year due to the publication of RICE (Reciprocating Internal Combustion Engines) NESHAPS (National Emission Standards for Hazardous Air Pollutants) legislation introduced by the United States Environmental Protection Agency (EPA).

The NESHAPS rule requires all owners of stationery RICE to minimise pollution generated through their use. This can involve retrofitting catalytic convertors to older engines and can also include the installation of efficient extraction systems in the workplace to ensure the air is clean.

Legislating on air quality in industrial workplaces has been proven to have beneficial impacts not only on workers' health and factory safety, but also on the quality of the external air.

Extraction

Oil mist, smoke, dust and fume extraction equipment can make a significant difference to the air quality inside manufacturing facilities – leading to reductions in health problems, accident risks and hazardous pollutants in the atmosphere.

The most effective method of dealing with all airborne hazards is to remove them at source - before they have time to escape into the workplace and, potentially, the external atmosphere.

Oil mist can be collected in a number of different ways, however centrifugal systems have been found to be one of the most cost effective and efficient methods, and are currently used in a

wide range of manufacturing applications in industries including aerospace, automotive, medical, defence and food production.

These systems use a perforated drum with specially designed vanes which rotate at very high speeds. Oil mist is drawn into the unit and impacts on the vanes at high velocity and specially designed synthetic pads assist the collection process and filter out stray solid particles.

The centrifugal force then pushes the oil to the unit's outer case where it drains back to the machine for re-use or collection and clean air is returned to the workshop through the top of the unit. The dangerous particles have been removed, re-cycled coolant can be re-used (saving money), and employees are protected from the potential health hazards associated with breathing in polluted air.

Energy

It is also important to note that the amount of power used in the extraction process can also make a difference to pollution levels – particularly in countries such as China which are still heavily reliant on burning fossil fuels to generate electricity. Reducing the amount of energy used to power the system means less fossil fuel needs to be burnt – in turn, helping to reduce external air pollution.

The use of energy efficient motors is one way of reducing the amounts of electricity needed to run effective extraction systems, and some companies have already introduced highly efficient IE3 motors as a direct response to the issue of reducing global energy consumption.

Additional information

A short animation which explains how the centrifugal system works can be found on Filtermist's YouTube channel, and more details can be found by visiting www.filtermist.com.