Management controls

While not all paper mills are the same in terms of the products they produce and the way they achieve the end product, there are some very similar safety hazards associated with paper, fibre board and tissue production that will affect all mills to a greater or lesser degree, dependent upon the individual mill.

The process for tissue paper often relies upon recycled waste paper delivered in ‘banded’ bales by 40 foot curtain sided HGVs. Bales are offloaded and stacked in designated bays that are accounted for from delivery until use by the pulper, which turns the waste paper in to liquid ‘stock’in preparation for the removal of unwanted plastics and other ‘foreign bodies’. The largest waste paper bales can weigh about 500kg each and the more any bale is handled by forklift trucks the more it can become damaged and begin to fall apart, so careful stacking of the bales must take place with safe systems of work in place to ensure all workers understand the dangers and precautions required. For example, operators assess the condition of each bale prior to stacking, a restriction on the height of bale stacks to reduce the risks of toppling over, and no pedestrian activity takes place around the ‘in use’ bays while forklift trucks are stacking or de-stacking. One of the highest risks in the waste storage area is the potential for self-ignition of waste paper bales. After all, paper is derived from organic material and just like your compost heap at home, decomposition creates heat. Effective control by strict stock rotation ensures that no bale is kept on site for any longer than is necessary to prevent bales deteriorating to the point where spontaneous combustion occurs.

Risk assessment by individual sites can determine a safe turnaround time for bales based upon type of materials and other criteria such as covered or open storage. Further management controls can be put in place to measure moisture content of old bales and long temperature probes measure heat build up at the centre of a bale to ensure it remains within safe limits. Any bale found to be outside of the safe storage criteria can then be identified and sent to the pulpers for immediate use.

As with other manufacturing industries, machine safety is of paramount importance and the use of appropriate guarding to protect from dangerous moving parts of machinery is a necessary part of a paper mill’s production. The usefulness of risk assessments and safe systems of work as part of risk management and the overall provision of information, instruction and training to employees on the safe operation of machinery cannot be underestimated. However, at the end of the manufacturing process, the tissue paper comes off the machine and is wound into large parent rolls, which is a particularly dusty part of the process as the tissue is now in finished form.

Control of tissue dust

The control of tissue dust is covered primarily under the Control of Substances Hazardous to Health Regulations (COSHH). This legislation requires all employers to protect workers from the harmful health effects of hazardous substances in the workplace, including the effects of dust. Within tissue paper making processes there is the potential for workers to be exposed to high levels of paper and tissue dust. Being regularly exposed to high levels of dust can cause respiratory system and cause workers to become ill from occupational asthma or other respiratory conditions. Those already suffer from non-occupational related asthma will also be more susceptible to the affects of tissue paper dust, which may trigger an asthma attack.

Regular occupational health surveillance of employees will help identify any potential health problems early on and can also act as an indicator to confirm controls continue to be effective.

Exposure limits

Paper and tissue dust is covered by the Work Exposure Limit (WEL) specified for “dust of any kind”. The WEL has been set at 10mg/m3 total inhalable dust or 4mg/m3 respirable dust and this should not be exceeded. These limits relate to the amount of dust in the air, which is averaged over an eight-hour working day. However, employers must reduce exposure to dust to as low as ‘reasonably practicable’ even if below the relevant WEL.

Many mills operate 12-hour shift patterns, which will increase exposure time for those relevant groups of employees compared with the average eight-hour shift.

Assessment

Regulation 10.1 of COSHH requires that employers monitor and measure exposure to a hazardous substance to obtain data on the level of exposure present in the workplace. Where it is identified that the exposure exceeds the relevant WEL, appropriate controls to reduce the exposure level need to be considered and the most effective and reasonably practicable solutions put in place. Once implemented, further monitoring will be required to establish the effectiveness of the controls in reducing the level of exposure below the WEL and continues to remain effective in the future.

Air sampling and monitoring should be assessed by a competent person by carrying out a dust survey and monitoring exercise to establish:

● if the work area has a dust issue
● the individual workers likely exposure levels to dust
● which tasks may generate high levels of dust
● where controls may be needed to reduce exposure to an acceptable level.

The dust survey will need to include static background monitoring as well as personal monitoring to get a complete picture of dust levels within the work area being assessed.

Practical solutions and control measures

Should exposure levels beyond the WEL be identified, employers must decide the best means of reducing dust. Control measures can include:

● If properly designed and implemented correctly Local Exhaust Ventilation (LEV) can provide a very effective means of reducing dust in the workplace. If used, LEV must be checked every 14 months as a minimum, to ensure it is working as expected.
● Water curtains can be effective in some situations and has been found to be more effective than LEV in some cases.
● In some scenarios general dilution ventilation can be sufficient to reduce exposure.
● Good housekeeping and cleaning regimes can be an important tool in reducing employees exposure. The use of compressed air lines is not recommended as this can increase exposure of those carrying out the cleaning and also those working nearby. The HSE considers that the use of air lines to ‘blow down’ is the major contribution to overall dust exposure in the industry. Vacuum cleaning, sweeping and damp cleaning regimes are practical alternatives to cleaning down with airlines.
● The use of air conditioned operator refuges is considered by the HSE to be one of the potentially effective control measures during tissue manufacture.
● Compulsory use of respiratory protective equipment (RPE), for example dust masks, for reel changes, paper breaks and cleaning duties.

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Management controls

From fire risk to tissue dust, Lawrence Green FIIiRSM talks us through the management controls needed in paper manufacturing.

Following the paper trail