



Air filtration prevents fires

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By Treena Hein

Dust explosions are always a risk in any wood processing plant, and one that the forest industry takes extremely seriously. In B.C., there were two explosions at sawmills in 2012, and in each explosion, two people were killed and others were injured.

These terrible events spurred the creation of a Manufacturers Advisory Group (MAG). It was given the goal of providing the industry with a better understanding of (and improved ability to manage the risks created by) combustible wood dust. The task force was created by the CEOs of BC forest manufacturers representing an estimated 70 per cent of raw wood production in B.C.

There were three components to MAG's mandate. First, members went away and did research into the combustion risks of dust, from both green wood and dry beetle-killed wood. Then, they created best practices for dust mitigation (partly through analysing what is done in the grain handling industry) and also created an industry-wide auditable standard.

"Wood dust has always been recognized as a safety hazard," says James Gorman, "but what came out of these tragedies and the work that came after, was the recognition by the industry that beetle-killed wood dust has properties that are different than green wood dust". Gorman is President and CEO of the Council of Forest Industries, which represents most of B.C.'s interior mill operations and was part of the task force creation.

"We had the best sawmill safety experts from across the province, and they found that the dust from beetle-killed wood necessitated new dust handling practices and procedures", Gorman explains. "This unprecedented industry-wide collaboration and the auditable standard led to better dust management through new protocols, better employee training and improvements to existing air filtration systems".

The auditable standard was developed by industry and has been made broadly available by industry and WorkSafe BC (see end of article for link). "It encompasses a mill's equipment, its systems and all the processes and procedures inside the mill from a dust mitigation perspective," Gorman notes. "The scope of the audit extends through the entire processing chain, from log delivery into the yard to the time lumber is loaded for shipping out. Action plans and additional follow-ups are included."

In terms of facilitating compliance, MAG has worked collaboratively on this with regulators. "MAG members have demonstrated compliance in their own facilities," Gorman relays, "and have also worked actively to engage non-members in risk reduction efforts. Many members have also initiated plans to extend these safety enhancements and training to their facilities outside of the province".

MAG received the province's highest safety honour (the Lieutenant Governor Safety Award) from the B.C. Safety Authority in November 2013. The awards recognise individuals and organisations who demonstrate exceptional leadership and innovation in the promotion of technical systems safety.

Industry comments

Canadian Forest Industries checked with some top companies that make air filtration systems for sawmills to hear about system scope and new developments. In terms of what an air filtration system can accomplish in a mill, Tony Vasilakos, vice president of engineering at Laval, Quebec-based AIREX Industries, says proper dust capture will not only reduce air-borne particulates, but will reduce dust accumulation on sensors and electronics that may cause malfunctioning equipment – which in turn reduces overall maintenance and housekeeping.

Brad Carr says dust collection systems in sawmills can capture 90 to 95 per cent of the overall dust produced if there are proper suction pressures, and if the suction hoods are placed correctly. “The five to ten per cent that it can’t get becomes fugitive dust,” explains the president of IES (North Carolina-based Integrated Environmental Solutions). “There is a cost/benefit ratio at work in trying to get that remaining fugitive dust. The cost rises exponentially to try to eliminate that last 10 per cent through filtration.”

He also points out that if you have an open system where you are moving materials with fork trucks and/or assembling materials on a table, filtration becomes impractical. “You can’t put in a filtration system that would work well enough in these scenarios, and there are a lot of open processes that won’t allow for a hood to be put on them.”

There are two basic air filtration options in a mill: central and localized unitary systems, says Carr. “With the central system, you have extensive ductwork throughout the plant,” he notes. “The advantage is that with this approach you have all the waste carried to one point. So it’s collected to one place for removal. ”A localised unitary system is used for one piece of equipment or at one process point. “The advantage is that it is less expensive to install because it has less ductwork to install,” Carr notes. “The weakness is that it takes up space on the processing floor and sometimes [building code restrictions won’t allow] you to put it in at all”.

Oregon-based Carothers and Sons President Rick Boatwright says the simplest and most efficient dust collection system uses ‘Pulse Jet Technology’. “[In our system], we use compressed air to clean rows of bags in a predictable manner to offer continuous operation over countless hours,” he says. This ‘smart’ system lets operators know in real time what the system is doing.

Common units include cyclones, cart collectors, shaker baghouses, non-cleaning baghouses and reverse-pulse or reverse-air baghouses. “Each has its advantages, although the unit of choice would be a baghouse with reverse-pulse cleaning due to its high capacity, efficient cleaning and accessibility,” explains Vasilakos.

In terms of maintenance, Carr says leaks must be repaired regularly. “There tends to be leaks because the materials that go through the pipes erode the inside of the ductwork,” he notes. “You also have to be diligent to periodically check motors, sensors, dampers, filter media, extinguishers, and actuators”.

He also strongly emphasises the critical importance of pressure checks. “If the filter ductwork is under a positive pressure, then the ductwork will release combustible dust into the room if there is a leak,” he says. “If the filter ductwork is under a negative pressure, then it will lose pressure if there

are leaks in the ductwork. This will reduce the suction at the suction hoods, which will cause more fugitive dust to be released into the plant.”

Keeping units working properly means regular maintenance, greasing schedules, review of the magnahelic gauge (monitoring the bag accumulation) proper dumping of accumulating bin and maintaining no water in the compressed air line used for cleaning.

Cold weather should not affect air filtration system operations, but any filtered air that is not returned to the plant will increase the amount of outside air that needs to be heated, which will increase the cost of heating the plant. If exhaust air can be returned back into the building, this will save on heating costs.

”If you can, you need to capture dust at the point it is generated as long as it is fiscally practical,” Carr concludes. “The energy, capital and ongoing services required for a filtration system is a legitimate cost of doing business.”



The SonicAire 2.0 installation in a planer mill prevents fugitive wood dust from accumulating by creating an overhead air curtain using BarrierAire Technology. Dust explosions are always a risk in any wood processing plant