

filter management



enhanced performance

Particulate Emission Monitoring in the Wood & Particleboard Industries

increased efficiency

Holz-BG



Particulate
0-15mg/m³
0-30mg/m³
0-150mg/m³



BImSchV 17 0-15mg/m³
BImSchV 13 0-150mg/m³
BImSchV 27 0-30mg/m³



Certificate No: 9389

PCME and the Wood

PCME's involvement with the Timber Industry over many years has led to the development of a range of many unique solutions for in-stack particulate monitoring. Working worldwide in conjunction with the industry's leading Timber and Particle Board manufacturers, PCME provides an unparalleled range of instrumentation to monitor the extremely low levels of dust normally associated with the filtration systems used in the manufacture of wood based products. These units not only help to protect our environment by aiding legislative compliance but also help in reducing operator costs by reducing filter maintenance and process downtime.

Debarking, Cutting and Chipping

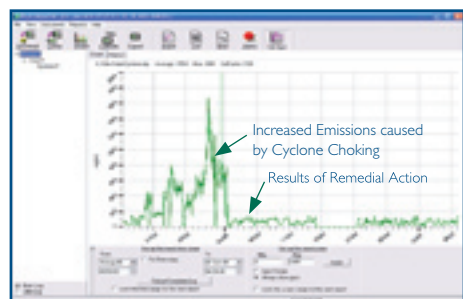
Due to the high levels of moisture and sticky particulate associated with these cutting processes, cyclone systems are normally used to limit the amount of fugitive dust emissions to atmosphere.

To assess the performance of the filter and to warn of potential choking of the Cyclone, Electrodynamic systems are utilised.

To overcome the problems associated with standard Triboelectric units caused by moist particulate de-sensitising and ultimately short-circuiting the sensor, PCME supply a patented fully insulated probe. This unique industry proven sensor is successfully used in thousands of moist and damp installations worldwide.



De-barking and chipper cyclones monitored by insulated Electrodynamic sensors



Cyclone Performance Monitoring



Patented fully insulated sensor used in moist applications such as cutting and chipping plants



Bag House monitored by Electrodynamic® Sensors

Wood Chip Boilers

Bag Filters are commonly used in conjunction with Woodchip Boilers to reduce particulate emissions. To monitor the low emission levels from these filters (typically single figure mg/m^3), Electrodynamic systems are preferred. These instruments employ a patented non-contact charge induction technology and for dry filter applications are supplied with a metal sensor rod.

Unlike traditional Triboelectric units and Opacity systems whose readings are affected by particulate build-up on the sensing elements, they are unaffected by contamination and do not require frequent cleaning of the sensor rod. As additional services such as purge air are not needed, the cost of ownership of Electrodynamic systems is by comparison to other techniques extremely low.

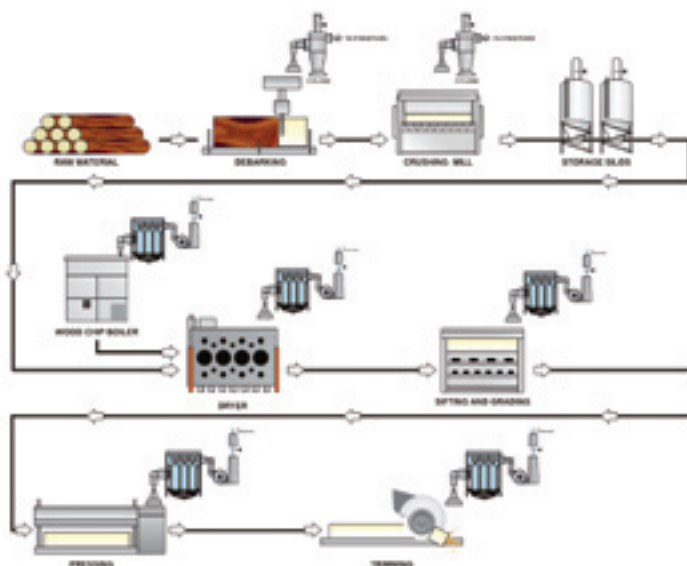
Dryers and Return to Air Systems

European regulation, EN12779, requires air returned to the workplace to be continuously monitored if the flow rate is greater than $10,000 \text{ m}^3/\text{h}$. PCME's Electrodynamic technology is approved by Holz-BG to monitor the extremely low levels of dust ($<0.3 \text{ mg}/\text{m}^3$) allowed to be returned into the workplace by these internationally recognised standards. Changes in emission levels can be monitored either locally or remotely via an RS232 or 485 link to allow the repair of the filter before exposing the workforce to high levels of dust. Any breaches of the $0.3 \text{ mg}/\text{m}^3$ limit activate alarm relays to facilitate the diversion of dust to atmosphere.



Workplace environment monitored by Holz BG compliant instrument

Wood & Particleboard Manufacture



Typical monitoring points on Primary and Secondary plants

Particleboard Industry

PCME's range of particulate monitoring instrumentation encompasses many different technologies to provide the best solution for each application and provide enhanced benefits for users. Set out below are a selection of proven solutions for the Timber industry. For further details please contact us directly on sales@pcme.co.uk or discuss your requirements with our experienced team of local distributors.



Silo Filter remotely monitored by a networked Electrodynamic System

Silo Monitoring

Silo filters are by their very nature sited in remote locations where it is extremely difficult to identify increases in particulate emissions before a major release of dust has occurred.

To overcome this problem, PCME provide a range of both trending and calibrateable instrumentation to continually guard against nuisance dust emissions. These systems offer both local alarms to allow automated plant shut down together with remote observation of filter performance via either 4/20mA or Modbus connections.

Sifting and Grading

The capability of advanced Electrodynamic monitoring systems to warn of increasing emission trends and in conjunction with a Predict software package to accurately indicate which filter row within a bag house is under performing can rapidly effect pay back of the instrument. On-going cost savings can be made by both increasing the useable life of the filter media and by reducing lost production time caused by unplanned filter outages.



Filter down-time reduced by predictive maintenance



Simple single-point mounting adds to ease of installation

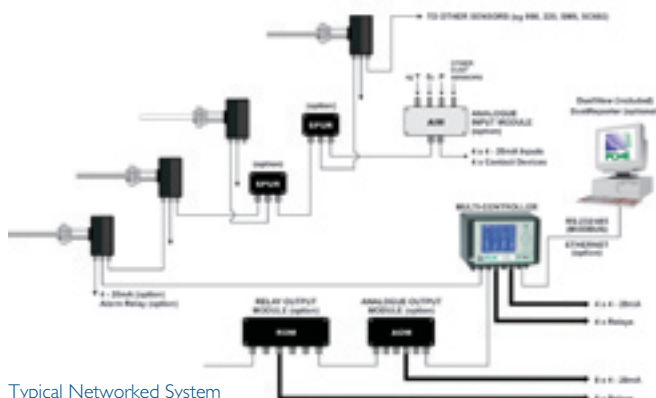
Trimming Processes

The rugged construction, ease of use and reliability of these industry proven monitors, have made them a popular choice for the exacting monitoring requirements as laid out by International Regulations. PCME's TUV and MCERTS approved Electrodynamic solutions to dust monitoring problems have earned favourable comments from leaders in the industry.

“The provision of reliable, efficient continuous monitoring enables us to ensure that our manufacturing processes achieve our goals in respect to our Environmental commitment & responsibilities.”

(H. Wright Egger UK)

Networked Solutions



Typical Networked System

Wood processing facilities normally employ multiple filters often in remote parts of the plant. To monitor these bag houses and cyclones, PCME provide a wide range of Electrodynamic instruments ranging from single channel units to multi-channel systems. These sensors use modbus technology to network to a single control unit. The control unit logs historical data for environmental reporting and process control, displays emission values and allows easy configuration of the system.

The controller may be connected directly to a LAN to allow remote interrogation of the system by a number of different users, environmental, process, maintenance, etc. Both historical and real time data together with alarm status may be displayed simultaneously on different PCs and the Predict software package used to remotely diagnose filter maintenance issues.



Advanced Probe Contamination Check

To provide the utmost confidence in the measurement, PCME's advanced monitoring systems utilise a unique patented secondary contamination ring which monitors any leakage currents or signals across the insulator thereby proving the measurement integrity of the sensor at all times.

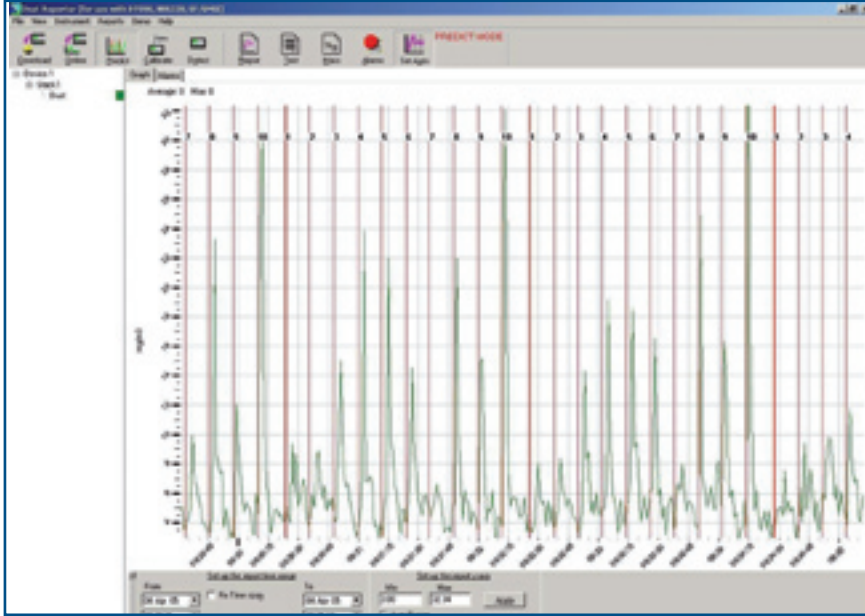
This automated check of the sensors functionality eliminates the need for time consuming manual inspection of the unit, which is common with other monitoring techniques.



Functioning sensor with high degrees of resinous wood particulate build-up

reduce costs, increase production

The use of filter performance monitors in conjunction with Predict and Ethernet connectivity allows for the first time the possibility of truly remote observation of the condition of both bag and cartridge filters. Used in conjunction with low level emission warning alarms, it allows the remote inspection of filter elements before dust emission levels breach regulatory limits, thereby allowing scheduled maintenance and eliminating the lost production time normally associated with unplanned plant stoppages.



The Deterioration of Row 10 is highlighted in real-time before environmental limits are breached

The above graph, down-loaded from an Electrodynamic instrument illustrates some of the capabilities of this system. The sensor, which was originally fitted purely as an environmental monitor is installed in the outlet stack of a 10-row bag filter, each row comprising 20 bags.

The bags in this particular filter were traditionally replaced annually as recommended by the filter manufacturer, however, in this instance the plant's maintenance department fitted an Electrodynamic system instead and left the old filter elements in place. After several months, an increase in Bag Leakage Trends was identified and low-level alarms alerted plant operators to increased emissions from the filter. This information was made available to plant, environmental and maintenance departments simultaneously via an Ethernet connection to the instrument. This advanced warning of filter failure allowed the maintenance department to schedule the fitting of replacement filter elements. This has the following benefits: -

- **Reduction of lost production time**
- **Identification of row failure allows the use of fewer replacement filter elements**
- **Labour time and costs are both reduced**
- **Service life of the majority of filter elements has been greatly extended**
- **Filters are now checked post-maintenance to ensure that all bags are correctly fitted and have not been damaged during installation**

Over a period of time, Predict has helped to highlight a further problem with the filter. It was noted that gross filter deterioration was always apparent in the same two rows and as a result of this, the gas stream inlet to the filter was modified resulting in more even wear and extended filter life.

The ability of the instrument's control unit to input 4-20 mA signals from other devices has allowed the system to be used in conjunction with pressure drop devices to monitor the caking of the filter bags allowing the optimisation of the cleaning cycle reducing both compressed air usage and bag wear.

This instrument, although originally considered as just an Environmental purchase is now regarded as an integral filter maintenance tool and the system has been expanded to monitor a further 8 filter systems, providing not only environmental protection but also reduced costs and increased production.

The use of Predict allows: -

Scheduled maintenance

Reduced maintenance times

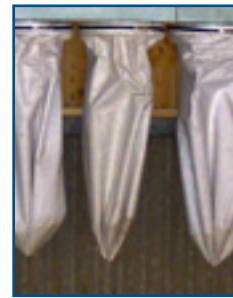
Lower labour costs

Reduction of spare filter inventories

Longer bag life

Increased production time

Reduced environmental emissions due to better filter control



Filter Elements only replaced as required



Electrodynamic Sensor installed in bag house outlet

www.pcme.co.uk

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