



filter management

bag leak detectors

particulate emission monitoring



Particulate Emission Monitoring in the Cement Industry



Sira MC090152/00
Sira MC110187/00
Sira MC050066/05



EN 15267-3
EN 15859 - Filter Dust Monitor
- Filter Leak Monitor

PCME and the

PCME's involvement with the Portland Cement Industry over a period of more than twenty years has led to the development of many novel and unique solutions for in-stack particulate monitoring. Working worldwide in conjunction with the industry's major producers, PCME provides an unparalleled range of instrumentation which work in sometimes aggressive situations to help not only to protect our environment by aiding legislative compliance but also in reducing operator costs by reducing filter maintenance and process downtime.

Quarrying operations such as crushing and milling using fabric filters to prevent dust emissions can be successfully monitored using either simple Gross Filter Failure devices or advanced Bag Leak Detectors (BLD's) depending on local requirements. ElectroDynamic™ systems are the best suited to monitor these relatively small diameter stacks with low dust loads of typically 5 mg/m³ or less. These systems are virtually maintenance free and do not require additional services such as purge air.



Kiln stack and electro-filter monitored by ProScatter™ Instrumentation

Filter Management Systems

employing multiple ElectroDynamic™ sensors allow each compartment of large multi-chamber Baghouses to be constantly monitored to determine the deterioration of filter elements. These systems provide a proven method of not only reducing total environmental emissions but also allow preventative maintenance programs together with shorter plant down times to greatly reduce operating costs.

Advanced ElectroDynamic™ units can be employed pre-filter, both in Electro and Bag filter applications to ascertain filter performance.



Individual filter chamber performance continuously monitored via a networked ElectroDynamic™ system



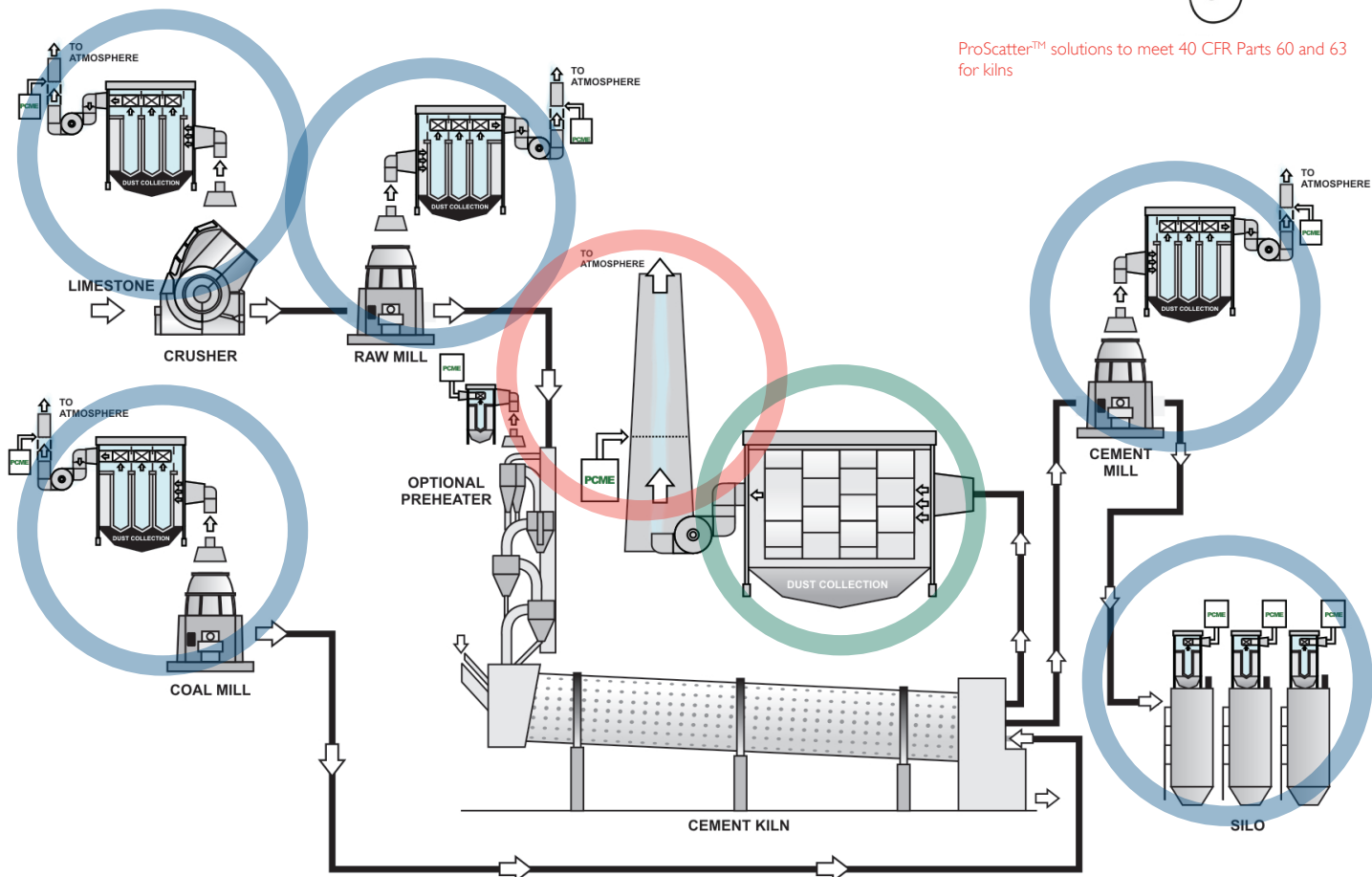
Crusher plant filter protected by an advanced ElectroDynamic™ unit

Kiln Monitoring techniques can be determined by the type of particulate filter used, dust levels and stack diameter or by legislative requirements. For plants complying to 40 CFR Parts 60 and 63, PCME supply two complimentary PS11 capable systems employing ProScatter™ technologies. These PM CPMS employ either Forward or Back Scatter laser techniques and have been industry proven for many years in legislative compliance applications worldwide.

Further details regarding ProScatter™ technologies can be found at www.pcme.com



ProScatter™ solutions to meet 40 CFR Parts 60 and 63 for kilns



Cement Industry

PCME's environmental monitoring instruments encompass 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 cement industry which allow users a choice of Compliance Pathways to meet federal regulations such as the USA EPA's PC and CISWI MACT rules for the Portland Cement Industry and other 40 CFR Parts 60 and 63 requirements. For further details please contact us directly on sales@pcme.com or discuss your requirements with our experienced team of local distributors.



Filter condition assessed remotely

Coal Mills employing ProScatter™ systems can be monitored not only for performance to comply with environmental legislation but by utilizing PCME's unique Predict software package, the monitor can be used as a powerful filter maintenance tool. This not only greatly reduces maintenance time and costs but eliminates the dirty and difficult job of identifying row failure by permitting remote identification.

Cement Clinker Mill stacks are not always dry. Many locations have very moist conditions which prevent the use of most technologies. PCME's unique, patented, fully insulated ElectroDynamic™ sensors overcome this problem to provide accurate data. In some instances, instruments have been continually used in these aggressive applications for over ten years with little maintenance. PCME's range of Bag Leak Detectors's feature instruments with fully automated Drift Checks and unique patented sensor contamination checks to reduce routine manual compliance checks. Fully insulated sensors should only be used in applications with damp dust or high moisture levels.



Damp cement mill monitored utilizing a fully insulated sensor



MultiController option provides automatic logging of emission data

Silo Filters can be monitored with single sensor units or multi-channel networked systems. These devices log data on board to accurately assist the setting of alarm levels, to facilitate warning of silo filter leakage or rupture avoiding environmental impact and product loss.

Recommended Systems

Bagfilter Monitoring



Bag Leak Detectors

- Simple installation
- Contamination resistant
- Automated Drift Checks (zero, span) and advanced probe contamination checks
- Insulated option for moist stack applications
- Data logging option for ease of alarm setting
- Stack sizes from 2 – 200"
- Ethernet connectivity
- International Accreditation (TUV and MCERTS)

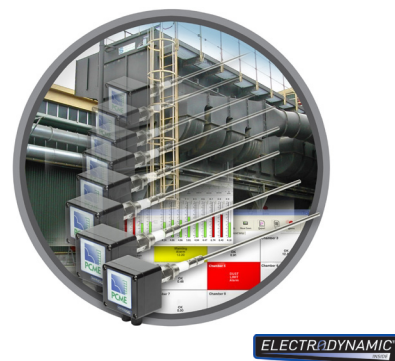
PM CPMS



PM CPMS

- PS11 capable
- Quality low level measurement
- Ease of installation – no alignment
- Automatic Drift and advanced contamination checks
- Insensitive to varying particle sizes
- Adjustable insertion length (PCME STACK 181)
- No moving measurement components For Stacks up to 30 feet diameter (PCME STACK 160)
- International Accreditation (TUV and MCERTS)

Filter Management Systems



LEAK LOCATE 330 Series

- Simple installation into baghouse chambers or ducts
- Network solution for bag filter control and chamber monitoring
- Bag failure predict capability
- Detects leakage and broken bags
- Ethernet and Digital communication to plant control systems
- Separate alarms for leakage and broken bag detection
- Reduces plant downtime and maintenance costs

cost and environmental nuisance reduction using filter failure prediction

Although particulate monitoring systems are generally purchased to monitor environmental emissions to atmosphere, many users also utilize these instruments as preventative maintenance tools. The ability to predict when a filter is likely to fail and to be able to identify which row or chamber is at fault has provided users with a proven method to not only reduce the environmental impact and clean-up costs associated with large-scale emission events but also to make significant savings in spares, maintenance times and lost production. To achieve this, the selected monitoring technique must be able to accurately track the very dynamic dust emissions created during a bag filter cleaning cycle. To these ends we recommend ElectroDynamic™ units in preference to Opacity or Triboelectric systems.

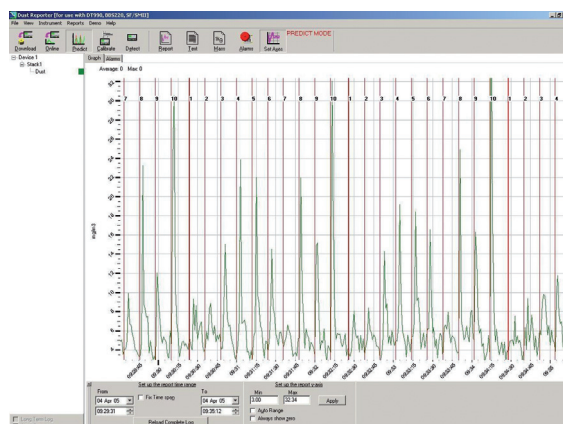
As a filter is reverse jet cleaned, any defects in the filter membranes are exposed resulting in relatively high dust peaks. By monitoring these peaks in real time using the Predict software package, it is possible to identify potential problems within the filter before they result in breaches of environmental limits.

The cleaning signature of the bag house is made easily identifiable by the input to the monitor of the filter's cleaning pulses via Auxiliary Input Modules. Additionally further outputs may be taken from pressure sensors within the bag house to assess the caking of the filter elements, thereby allowing the operator to reduce bag wear and compressed air usage and allowing the optimization of the filter system.

Predict provides the possibility to observe filter problems remotely and check maintenance work to ensure correct performance of the filter. The use of Predict has proven the ability of a monitor not only to be used for environmental compliance but also to be used as a significant aid to plant maintenance and to also enable users to greatly reduce the instances of catastrophic filter failure.

The use of Predict allows:-

Scheduled maintenance **Reduced** maintenance times **Lower** labor costs **Reduction** of spare filter inventories
Longer bag life **Increased** production time **Reduced** environmental emissions due to better filter control



Predict data identifying damaged bag rows (row10)



Predict offers the possibility of shorter maintenance times and the replacement of fewer filter elements

electro-filter efficiency monitoring

To optimize the performance of electro-filters, it is important to fully understand how much particulate the filter is actually removing from the gas stream. PCME's unique capability to provide a single monitoring system incorporating two separate sensors utilizing Optical or Laser technology for use post filter and ElectroDynamic™ Technology pre filter allows users to successfully measure Electro-filter efficiency. These two complimentary monitoring techniques are used as they offer the best monitoring solutions in the widely different conditions found in these two locations. ElectroDynamic™ sensors have a proven capability to monitor the extremely high dust loads found Pre-filter, providing a reliable, rugged monitoring solution whereas Optical sensors are chosen for use Post filter as a result of their capability to measure extremely low dust levels (0.1 mg/m³ utilizing ProScatter™ techniques) and their low maintenance requirements.

The ability to observe in real time the performance of the filter allows the operator to adjust operating parameters to optimize not only filter efficiency but also reduce operating costs, extend the filters operating life and



Effective electro-filter monitoring utilizing PCME's Optical and ElectroDynamic™ technologies