

filter management



# Emission Monitoring in the Cement Industry

particulate emission monitoring



Particulate  
0-30mg/m<sup>3</sup>  
0-150mg/m<sup>3</sup>



BlmSchV 17 0-15mg/m<sup>3</sup>  
BlmSchV 13 0-150mg/m<sup>3</sup>  
BlmSchV 27 0-30mg/m<sup>3</sup>



Certificate No: 9389

# PCME and the

PCME's involvement with the Cement Industry 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 filters to prevent dust emissions can be successfully monitored using either simple filter failure devices or advanced calibrateable systems depending on local requirements. Electrodynamic systems are the best suited to monitor these relatively small diameter stacks with low dust loads of typically  $5 \text{ mg/m}^3$  or less. These systems are virtually maintenance free and do not require additional services such as purge air.



Kiln stack and electrofilter monitored by Dynamic Opacity instrumentation

## Filter Management Systems...

Employing multiple indicative 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 and greatly reduced operating costs. Advanced Electrodynamic units can be employed pre-filter, both Electro and Bag to ascertain filter performance.



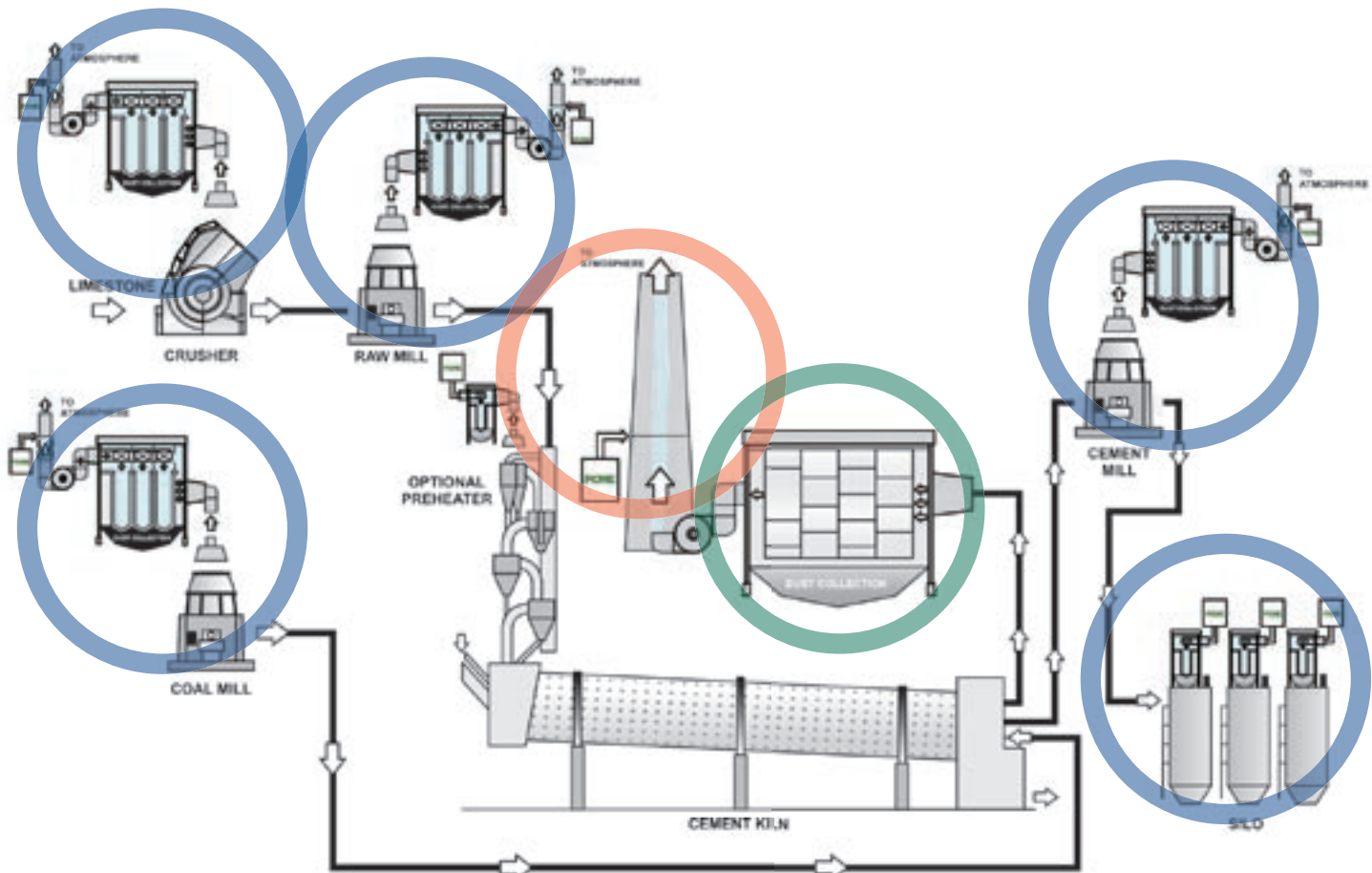
Crusher plant filter protected by an advanced Electrodynamic unit

## Kiln Monitoring...

Techniques are determined by the type of abatement plant used, dust levels and stack diameters. For plants using Electro-Filters, Dynamic Opacity systems are preferred. This cross-stack optical technology accurately measures particulate levels in  $\text{mg/m}^3$  whilst employing one of the least maintenance dependent technologies available. For plants utilising Baghouses, Electrodynamic sensors employing an induced, non-contact charge transfer technique designed to monitor the low dust levels normally associated with Fabric Filters are favoured. This choice of technology also allows the correct selection of appropriate monitoring methods to suit legislative requirements such as EN14181, I3284-2



Filter chamber performance continuously monitored via a networked Electrodynamic system



# cement industry

PCME's environmental monitoring range 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, for further details please contact us directly on [sales@pcme.co.uk](mailto:sales@pcme.co.uk) or discuss your requirements with our experienced team of local distributors.



Filter condition assessed remotely

## 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 calibrated data. In some instances, instruments have been continually used in these aggressive applications for over ten years with little or no maintenance.



Product loss prevented by silo monitoring

## Coal Mills...

Employing probe-based systems can be monitored not only for performance to comply with environmental legislation but by utilising 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.



Damp cement mill monitored utilising a fully insulated sensor

## 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 Products

### Bagfilter Monitoring



#### DT Series

- Simple installation – no alignment
- Contamination resistant
- Insulated option for moist stack applications
- Quality measurement from 0.01 to 10,000 mg/m<sup>3</sup>
- Stack sizes from 50 – 3000 mm
- Ethernet connectivity
- TUV and MCERTS Accreditation
- Zero, span and advanced probe contamination checks

### Electro Filters



#### SC Series

- Ease of installation – minimum alignment, no special equipment needed
- Quality measurement from 2.5 mg/m<sup>3</sup>
- Low running costs compared to traditional opacity systems
- Instrument not damaged if purge air fails
- Operates with heavy lens contamination
- Approved to TUV BlmSchV 13 and MCERTS
- Minimum effect from changing particle colour, shape due to ratiometric measurement
- Zero, span and advanced contamination checks

### Filter Management Systems



#### BBS 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
- Simple visual display of relative dust levels
- Separate alarms for leakage and broken bag detection
- Reduces plant downtime and maintenance costs

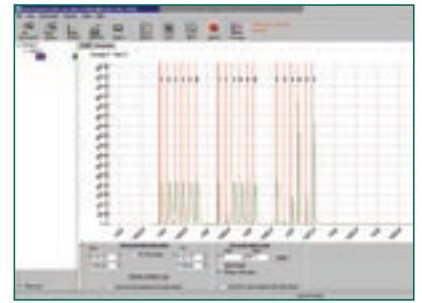
#### DT Series

- Installed pre-filter (bag and electro filter) to monitor filter efficiency in conjunction with main stack monitor
- Suitable for locations with high levels of particulate



## Cost Reductions Utilising Filter Failure Prediction

It is possible to make significant cost savings by utilising monitors to identify and predict the failure of fabric filters. This is achieved by monitoring the peak level of each row/cell of fabric filters as they are cleaned. As the filter is reverse jet cleaned the 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 highlight potential problems in the filter before they result in breaches of environmental limits. Predict provides the possibility to observe filter problems remotely, reduce downtimes, the number of spare filters held and maintenance costs.



Real time identification of bag row deterioration

## Electrodynamic Particulate Emission Monitoring

### Principle of Operation

Proprietary technique based on a charge induction principle derived from particle interaction with probe inserted into a stack or duct. The instrument output is an analysis of this frequency response and in appropriate applications is a function of the concentration of particulate.

### Applicability

- Bagfilters, Humid air streams\*

\* using patented insulated sensor

### Dust Concentration

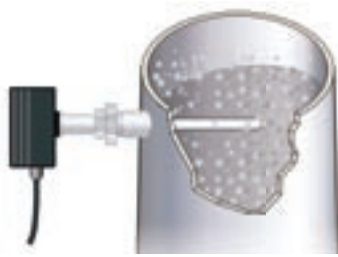
- 0.01 mg/m<sup>3</sup> to 10,000 mg/m<sup>3</sup>  
(product specific)

### Approval Range

- 0 – 30 mg/m<sup>3</sup> (MCERTS/TUV)

### Unique Features

- Unaffected by contamination of probe
- Unique solution for dryers & humid gas streams
- Optimised to tolerate changes of velocities >8 m/s (unlike Triboelectric systems)
- Zero and Span Checks
- Patented Insulated Sensor for humid applications
- Patented Probe Contamination check



## Dynamic Opacity Particulate Emission Monitoring

### Principle of Operation

Ratiometric measurement based on light variation

### Applicability

- Bagfilters, Electrostatic Precipitators, Boiler Stacks

### Dust Concentration

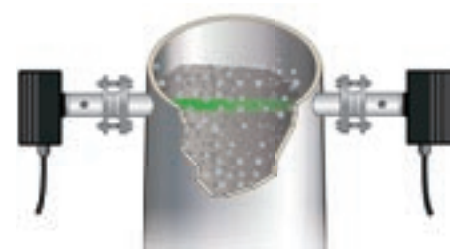
- 2.5 mg/m<sup>3</sup> to 20,000 mg/m<sup>3</sup>  
(minimum detection limit is application specific)

### Approval Range

- 0 – 150mg/m<sup>3</sup> (MCERTS/TUV)

### Unique Features

- Ratiometric measurement permits accurate measurement when lens contaminated up to 90%
- Zero and span checks on compliance instruments
- Selectable dust concentration and/or **opacity outputs**
- Light intensity, upscale checks
- Optional audit unit (model specific)
- Blower systems not required since air purge is sufficient



pcme worldwide

PCME is a worldwide organisation dedicated to the innovation, design, development, manufacture and supply of continuous particulate emission monitors for industrial processes. With instruments monitoring over 10,000 emission sources in over 40 countries, PCME provide a comprehensive range of products (using a choice of technologies) for bagfilter performance optimisation and regulatory emission measurement from main stack emission point.

PCME recognizes that service support is a critical issue for industrial operators who may depend on the results from instruments as part of regulatory permits or to provide critical process details. PCME offers a complete range of technical services which include taking 'turnkey' responsibility for installing and commissioning monitoring systems. Robust scheduled maintenance and calibration contracts are available in support of installed systems, providing on-site and factory service training and of course providing responsive emergency breakdown service.

[www.pcme.co.uk](http://www.pcme.co.uk)

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