

filter management

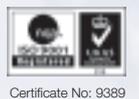


# Monitoring Solutions for Foundries

particulate emission monitoring



US-EPA  
MACT



# PCME's solutions for Particulate Monitoring in foundries

PCME'S involvement in both ferrous and non-ferrous foundries over the last 15 years has lead to the development of a unique range of particulate monitoring systems. Working in conjunction with some of the industry's key players, PCME provides an unparalleled range of instrumentation to work in the challenging monitoring conditions associated with high performance fabric filters.

## Monitoring solutions



*Bag house on a Sand Plant monitored by an advanced Electrodynamic® instrument*

To overcome the problems associated with monitoring the low levels of dust normally associated with the high efficiency bag filters used in foundry applications (typically single figure  $\text{mg}/\text{m}^3$ ), PCME's systems utilize a unique **Electrodynamic®** monitoring methodology incorporating a **patented non-contact charge transfer technique**.

This measurement technology is featured in a wide range of dust monitoring systems accredited to international standards (TUV and MCERTS) and designed to **fully meet the exacting self-testing and logging requirements (zero and span checks)** required by international regulations.

PCME provide a wide range of monitoring solutions, which not only result in **reduced labour costs** but also have the capability to offer both **filter failure prediction and reduced maintenance costs** together with **enhanced filter control and reduced operating costs**.

Unlike traditional Tribo-electric units, Electrodynamic® systems are unaffected by particle build-up on the probe rod which results in minimal maintenance.



*A fully MCERTS approved Electrodynamic® instrument replaces non-compliant DC unit on Knockout Sand Plant.*



*Fume from Pouring monitored using an Electrodynamic® System*

## Sensor solutions



*Insulated and metal probe elements offer industry proven solutions for both damp and dry filter applications*

Sensors are available with either a **patented** fully insulated probe or a unique, AC based (Electrodynamic®) rod. This metal sensor is best used in the dry applications found in foundries as it provides accurate, stable readings unlike the fully insulated sensor, which can be affected by static charge build-up when used in dry conditions. Based on PCME's wide experience of over 20,000, applications insulated sensors are only recommended for damp/sticky applications.



*Advanced probe contamination check*



*Sensor unaffected by probe contamination*

To provide the utmost confidence in the instrument's performance, PCME's advanced monitoring systems incorporate not only zero and span checks but also a unique **patented secondary contamination ring**, which monitors any leakage currents or signals across the insulator thereby proving the measurement integrity of the sensor.

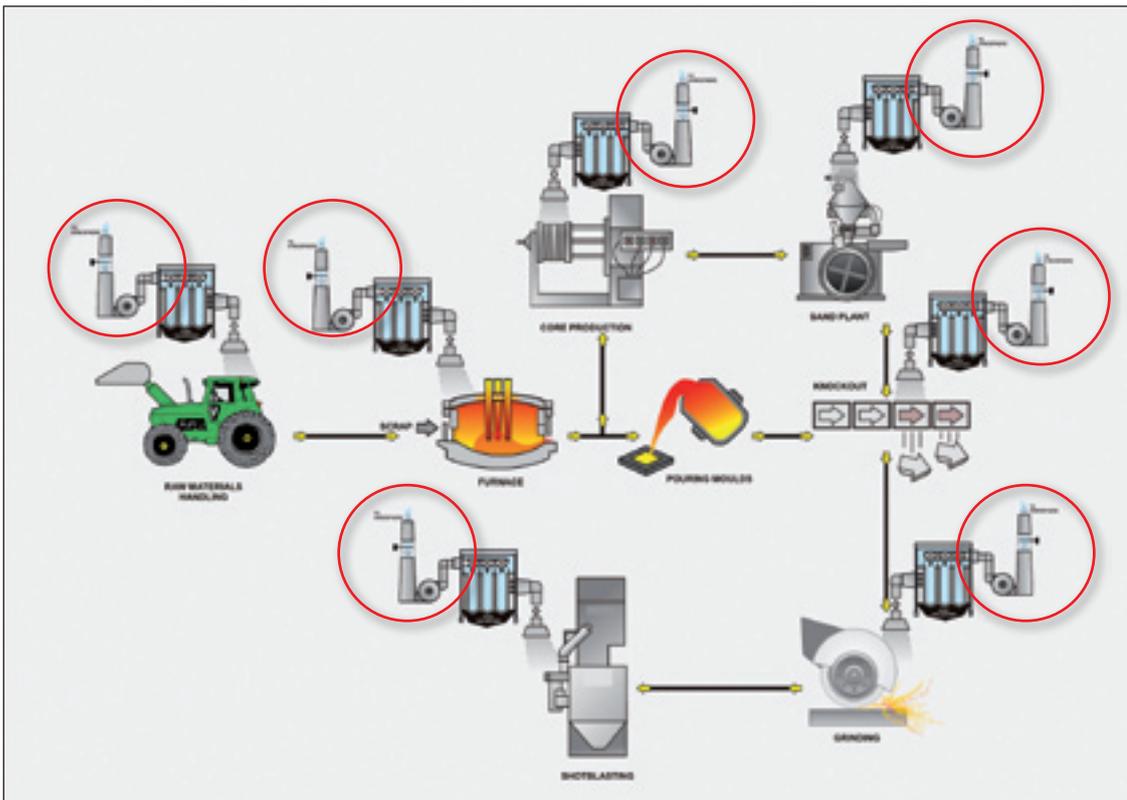
In many instances, this eliminates the time consuming action required of industry to physically inspect sensors to ensure functionality by **fully automating and logging probe contamination checks** - a unique feature to PCME instruments.

# Solutions for pouring areas, mold/core making facilities, sand plants, and dressing/finishing plant

PCME's range of MCERTS and TÜV approved instruments not only protect our environment by aiding legislative compliance but also decrease operator costs by helping to reduce filter maintenance costs and production downtime. They have a proven track record in thousands of foundry applications worldwide.

## Monitoring solutions

Foundry Applications//



Typical Monitoring Applications for Electrodynamic® Sensors

a Modbus protocol over an RS485 network to a combined logging/control unit making the connection of the system simple and cost-effective in comparison to multiple 4-20mA connections. Data from these instruments may be viewed simultaneously via an Ethernet connection to allow multiple interrogation of the instrument. e.g. Environmental Officer, Maintenance Department, Process Control etc. This method of connectivity allows **remote access** to not only historical emissions information, Bag Leakage Trends and QA test results, but also allows the real-time observation of the filters performance to allow **preventative filter maintenance**. This greatly reduces maintenance time and costs and also eliminates the dirty and difficult job of identifying bag row failure.

PCME provides compliance instruments that are specifically designed to **fully meet** the requirements for Bag Leak Detection systems as laid out in **international standards (IPPC & MACT)**. Combining the most advanced sensor solutions available on the market today together with advanced signal processing, PCME provide the total solution to easily configure systems to provide both accurate and repeatable dust measurement together with **automated logging of QA tests** (Zero and Span) making full regulatory reporting as simple as clicking a button.

PCME provides a wide range of monitoring solutions comprising not only Electrodynamic® systems but also accredited cross-stack optical and Pro-Scatter laser techniques. Based on this experience the selection of Electrodynamic® systems for baghouse monitoring has been made as they offer the most **cost efficient and reliable solution** to monitoring the low level dust emissions from fabric filters. Both single and multi-channel systems are available offering from numerous cost benefit solutions to single or multi-point emission monitoring requirements.

Electrodynamic® instruments are utilised in both ferrous and non-ferrous Foundries in the US and at facilities worldwide. Standard metal sensors are used on dry filter applications including those found in **Pouring Areas, Sand Plants, Mold and Core making facilities**. Sensors utilize

On **Knockout Sand Plant Filters** where cooling water is often used, the particulate carry over from the filter can be very moist (+25% relative humidity). In these instances, PCME utilise their Patented Fully Insulated Sensor to prevent short circuits that would occur with standard metal probes.

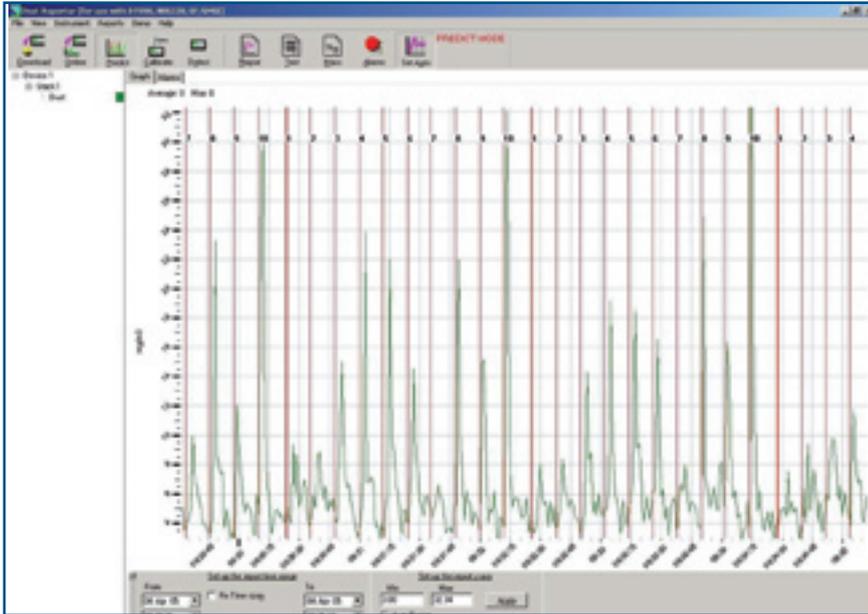
Electrodynamic® systems are used in other foundry areas such as Dressing and Finishing Plant (Grinding and Shot Blast). Standard sensors once again monitor these dry bag filters. All these instruments are Industry Proven and are virtually maintenance free, requiring no additional services such as purge air, they offer not only a low cost of ownership but the additional benefit of allowing operators to identify defects in the operation of the filter and use the monitor as an aid to **real operational cost savings**.



Networked Electrodynamic® Sensor used to remotely pinpoint bag row failure on a moulding sand plant

# 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 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**

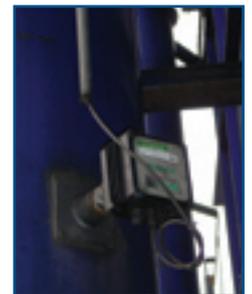
**Longer bag life**

**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

Contact Your National or Area Sales & Service Office:



**PCME Ltd**  
Clearview Building 60 Edison Road  
St. Ives Cambs UK PE27 3GH

Tel: Int +44 (0)1480 468200  
Fax: Int +44 (0)1480 463400  
E-mail: sales@pcme.co.uk