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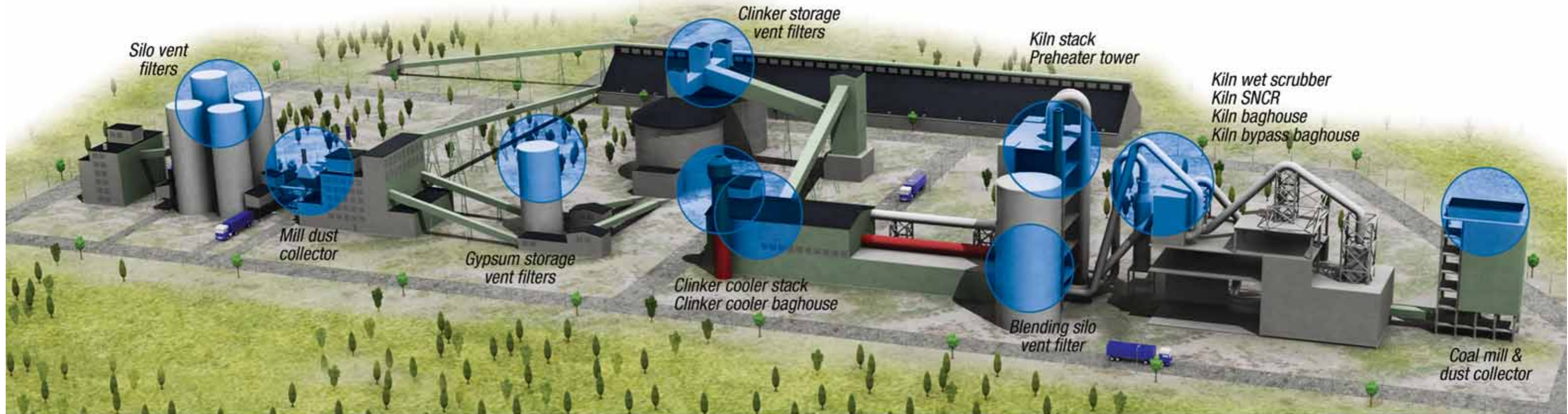
The Cement Industry

*Cost effective filter cleaning system
and emission monitoring solutions*



Solutions for Sustainable Cement Production

Proven solutions to cost effectively manage compliance with EPA & MACT requirements



Silo vent filters
Blending silo vent filter

3/4", 1" Filter cleaning systems and controls: diaphragm valves, solenoid valves, ASME air header assemblies, GOCO software

Bag leak detection systems **EMP6 & EMP7**

Gypsum storage vent filters
Clinker storage vent filters

3/4", 1" Filter cleaning systems and controls: diaphragm valves, solenoid valves, ASME air header assemblies, GOCO software

Bag leak detection systems **EMP6 & EMP7**

Clinker cooler baghouse
Mill dust collector

1.5", 2" Filter cleaning systems and controls: diaphragm valves, solenoid valves, ASME air header assemblies, GOCO software

Bag leak detection systems **EMP6 & EMP7**

Clinker cooler stack

EPA Stack flow monitor **Opal300**
EPA Mass particulate monitor **Opal200**

Kiln Stack

EPA CEM: O2, CO, NOx, SO2, THC, HCl : **GVC v3000**
EPA CEM HCl : **GVC v4000**
EPA CEM Hg : **GVC v5000**

EPA Stack flow monitor **Opal300**
EPA Mass particulate monitor **Opal200**

Kiln SNCR & Wet scrubber

EPA CEM: NOx, SO2 & NH3: **GVC v3000**

Kiln baghouse
Kiln bypass baghouse

1.5" to 3" Filter cleaning systems and controls: diaphragm valves, solenoid valves, ASME air header assemblies, GOCO software

Coal mill & dust collector

1.5", 2" Filter cleaning systems and controls: diaphragm valves, solenoid valves, ASME air header assemblies, GOCO software

Bag leak detection systems **EMP6 & EMP7**

Why develop an alliance with Tyco Environmental Systems

We understand the importance of particulate filtration and emissions monitoring delivering environmentally friendly and economically viable solutions to your business.

Increasing economic and environmental pressures on the cement industry places significant importance on maximizing manufacturing performance and process efficiencies throughout the entire plant operation.

Tyco Environmental Systems (TES), through its globally recognized brands Goyen and Mecair, continue to deliver industry leading filter cleaning systems and emissions monitoring solutions to industry, supported by over 100 years of combined market intelligence and application experience.

We offer a dedicated Research and Development team pioneering industry leading products and customizing solutions. World class manufacturing in two locations, global offices and local technical experts who will ensure all aspects of particulate filtration and emissions monitoring are optimized, supporting your business in delivering quality product, competitively.

Understanding the system

Our depth of experience and knowledge in both dust filtration systems and emissions monitoring ensures we can deliver significant efficiency improvements to many critical aspects of the cement production process.

Extensive research and development with bag house and filter media manufacturers has contributed to the development of our cleaning system products, and our clear understanding of their overall importance in the manufacturing process.

Our experience allows us to provide you with current system improvements and advanced new system design methods to assist the overall goal of economical and environmentally sustainable cement production.

Understanding the MACT requirements

Environmental awareness and pressures to operate in a eco sustainable manner, has resulted in tightening of EPA type legislations the cement industry already adheres too. The new MACT requirements will force cement plants to reduce hazardous air pollutants and conform to more stringent standards of performance.

To comply with the new MACT specified limits, plants will need to upgrade pollution controls and emission monitoring equipment for pollutants HCl, SO₂, NO_x, THC, CO, CO₂, O₂, Mercury Hg, particulate matter and dust.

Meeting MACT specifications will require a focus on enhancing vital filter cleaning system performance in dust collection systems throughout the cement process, which will contribute to significant reductions in emissions of dust to atmosphere and provide cost savings in ongoing operational costs.



Reliable backup and ongoing technical support

TES offers global reach and local service. Teams of engineers and service technicians who provide specialist service and support including:

- Turnkey supervision and commissioning
- System startup services
- Onsite training programs
- Emergency service
- Global delivery of spare parts
- Service and maintenance plans
- Expertise in dust collection

Expertise in dust collection filter cleaning systems

We have been supplying our suite of products to industry for almost 80 years, and pioneering products for the global pulse jet cleaning systems industry since its inception. Our Goyen and Mecair brands are the world leaders in developing new technologies to optimize filtration efficiencies in pulse jet cleaning systems. Manufacturing premium pulse valves, air header manifold systems and other performance enhancing ancillary products for all types of dust collectors including reverse pulse dust collectors, silo venting collectors, mill/crushing bag house, clinker cooler and other cement related filtration.

Dust collectors are a vital contributor to maximizing cement production output through optimizing filtration efficiencies and process flow.

- We have engineering capabilities to perform system analysis and recommend modifications to key elements of the system to maximize cleaning efficiencies.
- Correctly designed pulse cleaning systems will maintain low differential pressures and low emissions, thus improving process flow, minimizing expensive product loss, significantly extending filter bag life and cutting filter replacement costs, while ensuring product quality and maximum production output.
- Significant energy cost savings can be realized by improving the dust collector performance and reducing the load on compressed air systems.

Goyen GOCO Modeling Software

- Designed by our team of engineers, patented worldwide as the only software to accurately analyze your existing dust collector design and providing validated recommendations for system optimization for specific application parameters.
- Offers troubleshooting capabilities for analysis of existing systems.



Dust collectors are vital contributors to achieving maximum cement production output

Efficient filter cleaning systems are vital to dust collector performance and optimizing process flow

As global leader in filter cleaning systems, our expertise and products are vital in helping cement plants achieve their goals

We offer optimized filter cleaning system performance in bag houses through a comprehensive suite of products

- Goyen GOCO modeling software to analyze baghouse design
- High performance diaphragm valves which deliver up to 40% more cleaning energy into each filter than any other comparable size valve available.
- Certified pulse cleaning manifold systems in carbon or stainless steel complete with valves and controllers
- Cleaning system controllers and timers designed for network integration
- Filter leak detection systems minimizing product loss
- Pilot solenoid valves and enclosures, NEMA 4
- Superior pulse cleaning with specially designed blow tube nozzles and filter bag venturis which provide consistent cleaning pressures to all filters.



Our filter cleaning system products are globally renowned for their performance, quality, reliability, innovation and ease of installation.

Assured compliance with MACT/EPA through accurate gas and emissions monitoring solutions

TES gas and emissions monitoring products deliver sophisticated analysis and monitoring solutions which utilize proven sampling technologies to detect, monitor and report on cement process emissions.

Comprehensive suite of products which cater to a variety of monitoring requirements:

- Continuous emissions monitoring
- Tribo-electric and opacity monitors
- Combustion efficiency monitors
- Oxygen analyzers
- Data acquisition software system
- Bulk handling/product loss monitoring

Monitoring pollutants associated with cement manufacturing including:

Particulate matter, SO_x, CO, CO₂, NO_x, HCl, Hg, THC and other substances.

Integrated solutions are offered utilizing a variety of available analyzer technologies to meet application and budget requirements of each cement process.

Vital solutions for gas monitoring

Our range of MultiGAS monitoring products measure gas concentrations on a real time basis using state of the art Infrared (IR) Gas Filter Correlation (GFC), and Single Beam Dual Wavelength (SBDW) technologies.

Products extract gas samples and analyzes them for the desired constituents (including moisture and oxygen) and process the emissions data as stipulated in 40CFR Part 60/63/64/75/96/97/503 and new MACT regulations.



Vital solutions for emissions monitoring utilizing Opacity Technology

Tyco Environmental Systems range of OPAL opacity particulate monitors provide accurate, reliable and cost effective solutions to meet particulate monitoring applications from broken bag detection through to EPA compliance monitoring.

The Opal Opacity monitors are dual sensing for both opacity and dust concentration compliant with USEPA-PS11 dust concentration standards.

Utilizing high power modulated green LED lamp source and digital servo drive test mechanics for smooth operation, the Opal series offers high accuracy and low maintenance.

A full range of options are available including purge air blowers, failsafe shutters and audit test filter kits.

Vital solutions for emissions monitoring utilizing Tribo-electric Technology

Goyen and Mecair particulate monitors utilize AC tribo-electric technology to ensure dependable accuracy and repeatability across the range of particulate and dust application measurements.

All products are self contained devices for measuring particulate from bag houses, ducts and stacks and will meet Portland Cement Plant EPA regulations including Method 22 and the MACT bag leak detector guidelines.

Applications at cement plants include but are not limited to measuring particulates from the Kiln, Kiln Bypass, Finishing Mill, Clinker Cooler and Fuel Mill Bag houses and the numerous smaller houses for storage bins and conveyor systems throughout the plant.

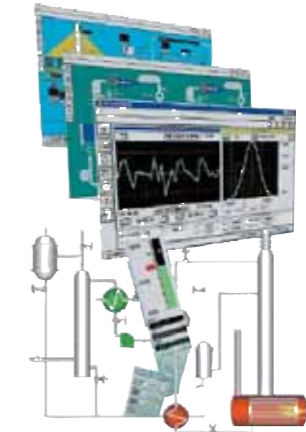


The Goyen and Mecair Tribo-electric products determine particulate concentrations.

Goyen also offers Flow monitors which determine mass flow rate of particles. Combining the two technologies results in the ability to cost effectively determine mass particulates in gas streams.

Reliable, timely data acquisition for process performance and regulation requirements

The Tyco Data Acquisition System interfaces to our continuous emissions monitoring systems and the Plant Control System through programmable logic Controllers (PLC) via industry standard MODBUS communication protocols.



Utilizing the power of PLC it is possible to control the analyzer and also have a local repository of data. This eliminates the use of proprietary data loggers, resulting in a very cost effective, reliable and flexible system architecture, providing easy user interface, data editing and EPA approved report formats.

- Compliant to all regulatory requirements including the PC MACT, 40 CFR Part 60, 63 and state regulations.
- Integrates into existing DAS software – Tyco Environmental Systems has experience working with leading DAS vendors and integrating our products into most DA Systems.
- Custom Data Acquisition System development for client applications; experience with implementing the latest reporting rules, customer reporting software, QA/QC plans for meeting all state regulations.

Complete system design through to commissioning exact solutions



An experienced team will analyze your filter cleaning systems, audit your gas and emissions monitoring requirements, and apply our systems knowledge to provide recommendations and detailed product solutions for your application.

Ongoing sales and technical support will ensure seamless integration and optimum monitoring solutions for your business.

TES have proven solutions to cost effectively manage compliance with EPA and MACT requirements

TES offer complete gas and emissions monitoring solutions at integral parts of the cement production process

Our aim is to work together toward sustainable cement production