



ABACO-LOI

MONITORING TECHNOLOGY
FOR ADVANCED LOI MEASUREMENT

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GENERAL OVERVIEW

- Technology for on-line carbon-in-ash measurement based on Loss On Ignition (LOI) determination
- Designed as modular equipment in order to assure easy assembly in small spaces and effortless performance of maintenance tasks:

Sampling module

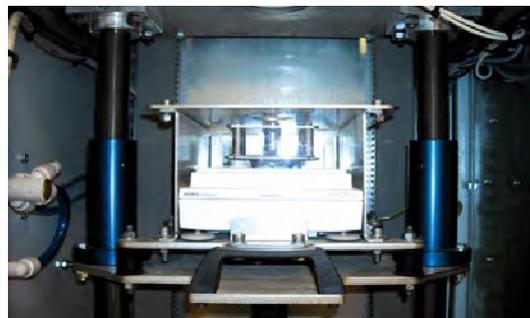
- Capable of collecting representative samples from the process and conveying them to the analysis module
- Extraction points are located in accordance with unit characteristics and requirements (hoppers, transport pipes)

Analysis module

- Aliquot is weighed on precise scale before and after calcination in a kiln at temperatures over 1,380 °F
- Sequential samples can be received from different sampling modules (multiplexing)

Control module

- Communication with Control Room
- Alarm and self-diagnosis management



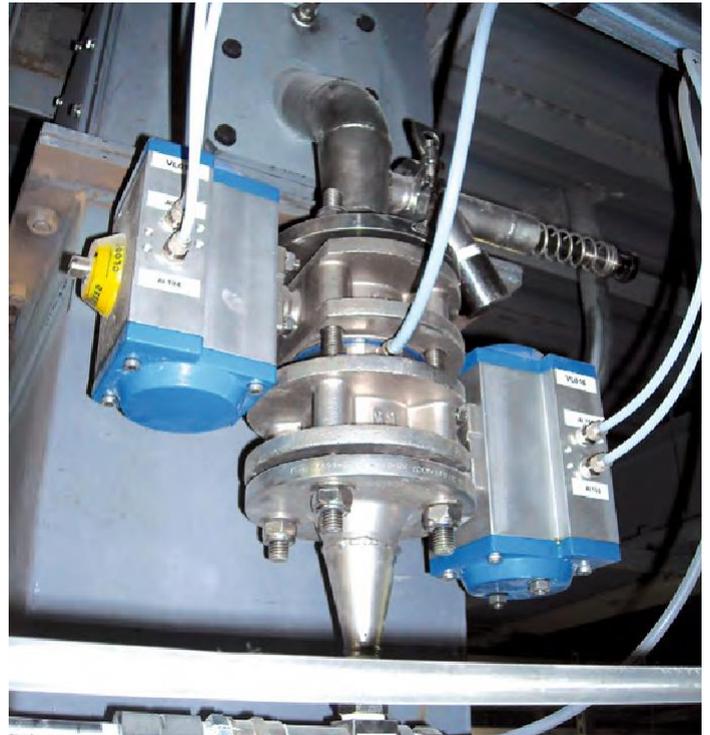
COMPETITIVE ADVANTAGES

- Reliable, even for the highest monitoring demands (over 8,000 measurements per month)
- Based on reference techniques (ASTM C311 Standard), avoiding recalibrations required by other systems (microwaves, infrared, etc.)
- Maximum accuracy within the entire range of measurement
- Unaffected by variations in physical-chemical properties of particles or interferences (carbonates, hydroxides, ammonia compounds, etc.)
- Response time: typically 5-7 minutes
- No obstructions during the transport of fly-ash
- Cost-effective approach by multiplexing different samplers with a single analyzer
- Robust, simple and service-free monitor
- Modular design resulting in versatility to fulfill client needs
- Optimized control software



APPLICATIONS

- Reliable automated LOI measurement with maximum accuracy
- Fuel savings through an accurate measurement of combustion efficiency
- Control of combustion tuning and burner operation in low NOx scenarios
- Control of activated carbon injection for mercury abatement
- Savings on technician and laboratory costs
- Ensure fly-ash saleability
- Ensure LOI consistency for fly-ash dealers
- Calculation of CO₂ emissions
- On-line characterization of coal (ash and volatile matter contents)



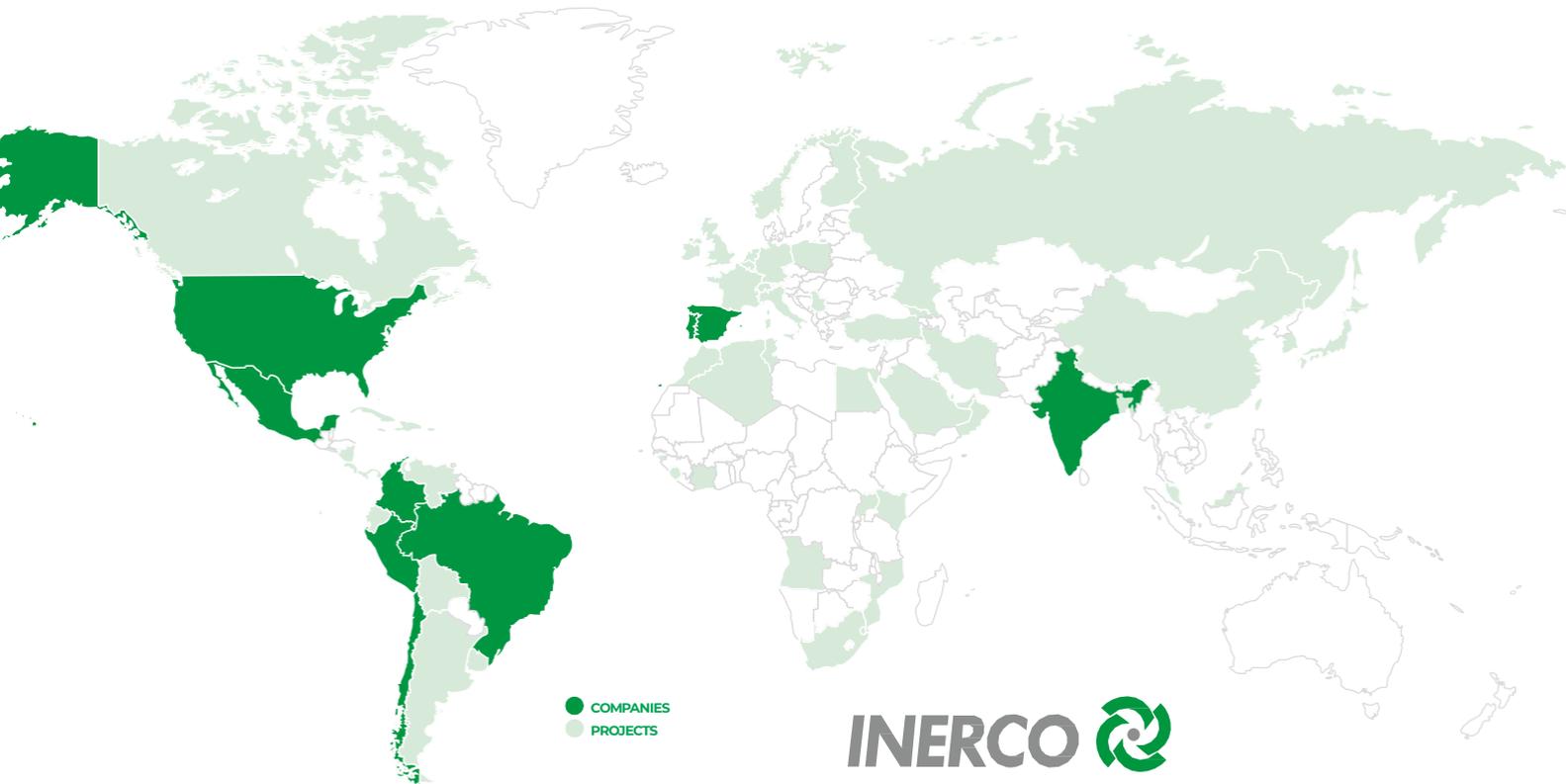
TECHNICAL DATA

DESCRIPTION	VALUE
Resolution	0.01% (absolute)
Precision	<± 0.1%(absolute)
Accuracy	<±0.1% (absolute)
Electrical consumption	Typical average consumption: I _{nom} : 11 A, 230 Vac., 50/60 Hz, I _{peak} : 21 A. Different voltage under request
Instrument air consumption (whole system)	Average consumption: 15 Nm ³ /h (6 bar) Peak consumption: 80 Nm ³ /h (6 bar)
Output	PROFIBUS, MODBUS, ETHERNET LOI value, warnings and alarms
Maintenance	Periodical substitution of compressed air filters, depending on the quality of the air

EXECUTIVE SUMMARY



- ABACO-Loi: on-line monitoring system for continuous measurement of unburnt matter (LOI) in fly-ash and coal properties (ash, volatile matter)
- Based on reference techniques (thermogravimetric analysis) similar to those used for laboratory analysis
- Unique advantages of ABACO-Loi (relative to microwave and other types of monitors):
- Assured and proven reliability (only monitor based on laboratory reference techniques)
- Maximum accuracy
- No drift, no calibration required
- Unaffected by changes in coal/fly-ash properties
- Unaffected by interferences
- Cost-effective by multiplexing samplers
- No flow obstructions



● COMPANIES
● PROJECTS

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OUR CLIENTS

GAS AND ELECTRICITY

Abelló Linde - AGA - Air Liquide - Alstom - BP Solar - CENER - CFE
- Colbún - EON - EDF - EDP - Elcogas - Emgesa - Enagas - Endesa
- Endesa Ireland - EnergieKontor - EON France - EON Italia - EVN -
Gas Natural - GDF Suez - HidroCantábrico - Iberdrola - Intergen - Linde
Gas - MedGaz - Pegop - Praxair - Promigas - PKE Polska - Reganosa
- Saggas - Scottish Power - Viesgo

HYDROCARBONS

Agencia Nacional de Hidrocarburos de Colombia - Asociación
Colombiana del Petróleo - Atofina - Baker Hughes - Bhp Billiton - BP -
Cepsa - CLH - Conoco Philips - Ecopetrol - Exxon Mobil - Mansarovar
Energy Colombia - Petro Santander Colombia - Petróleos de Venezuela
- Petrolífera Petroleum - Petronor - Repsol - Sonatrach

CHEMICAL AND PETROCHEMICAL

BASF - Biofilm - Brenntag - Brinsa - Dow Chemical - ENCE - Ercros -
Erkol - Fertial - FMC Foret - Huntsman Tioxide - MAXAM - Mexichem
- Oiltanking - Propilco - Rhodia - Solvay - UBE - Voridian

MINING

Bhp Billiton - Boliden - Catalina Huanca Sociedad Minera - Cerro
Matoso - CLC - Glencore - Los Quenuales - Matsa - Perubar

CEMENT AND STEEL

Aceralia - Acerinox - Argos - Atlantic Copper - Cementos Portland -
Cemex - Cimpor - EADS - Holcim - IZAR - Lafarge Asland - Malpesa -
Titan America / Separation Technologies - UNESID - Xstrata Zinc - Zinsa

ENGINEERING COMPANIES AND INFRASTRUCTURES

Abengoa - Acciona - Conalvías - Duro Felguera - Elecnor - FCC - Fluor
- Foster Wheeler - Gamesa - General Electric - Inabensa - Intecsa -
Inarsa - Isolux Corsán - Lima Ingeniería y Construcción - OHL - Opain
- Sener - Soluziona - Technip - Técnicas Reunidas - Vicon