



ABACO-Opticom

COMBUSTION OPTIMIZATION TECHNOLOGY
FOR LOW NO_x OPERATION AND IMPROVED PERFORMANCE

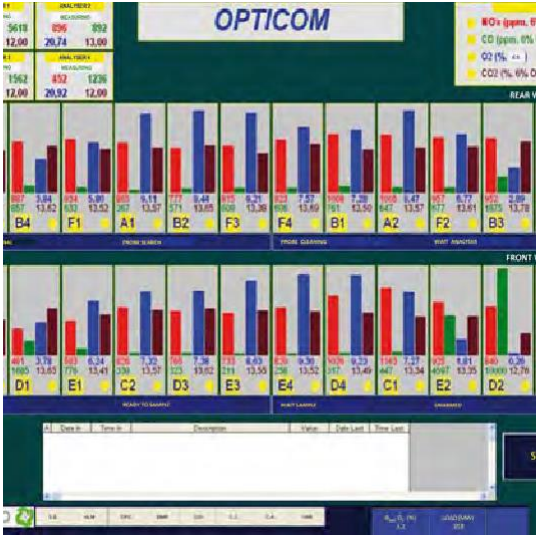
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GENERAL OVERVIEW

→ ABACO-Opticom combustion optimization system provides precise surveillance of the combustion process by the automatic measurement and control of in-furnace gas concentrations (O₂, CO, NO_x, CO₂, SO₂)

→ ABACO-Opticom provides plant operators with valuable information for preventing detrimental conditions to boiler walls and for tuning key combustion parameters (fuel and air distribution, excess O₂, etc.) so as to optimize emissions and efficiency



COMPETITIVE ADVANTAGES

- Characterization of actual combustion conditions: no software, no estimations
- Point to point measurements. No averaged results. No interpolation software
- Bending water-wall tube is not required: probes can be inserted through the tube membranes
- Measurements are not affected by fuel typology, dirtiness or optical-path alignment
- Easy/Direct interpretation of results
- Easy integration with process control: increased performance of SCR/SNCR
- Short response time, even for very complex multiburner systems



APPLICATIONS

- Control/Minimization of boiler operating problems: corrosion, slagging, fuel and air imbalances, air in-leakage, efficiency losses, etc.
- Co-firing: maximize co-firing rates for “problematic” fuels, PRB, biomass, etc.
- Improved process supervision in scenarios with high variability of fuels and unit loads
- Combustion tuning based on real information
- Adaptable to any boiler, furnace or heater
- Applicable to coal, oil or gas firing
- Applicable to every firing type: T-fired, front or opposed-wall firing, vertically-fired, etc.

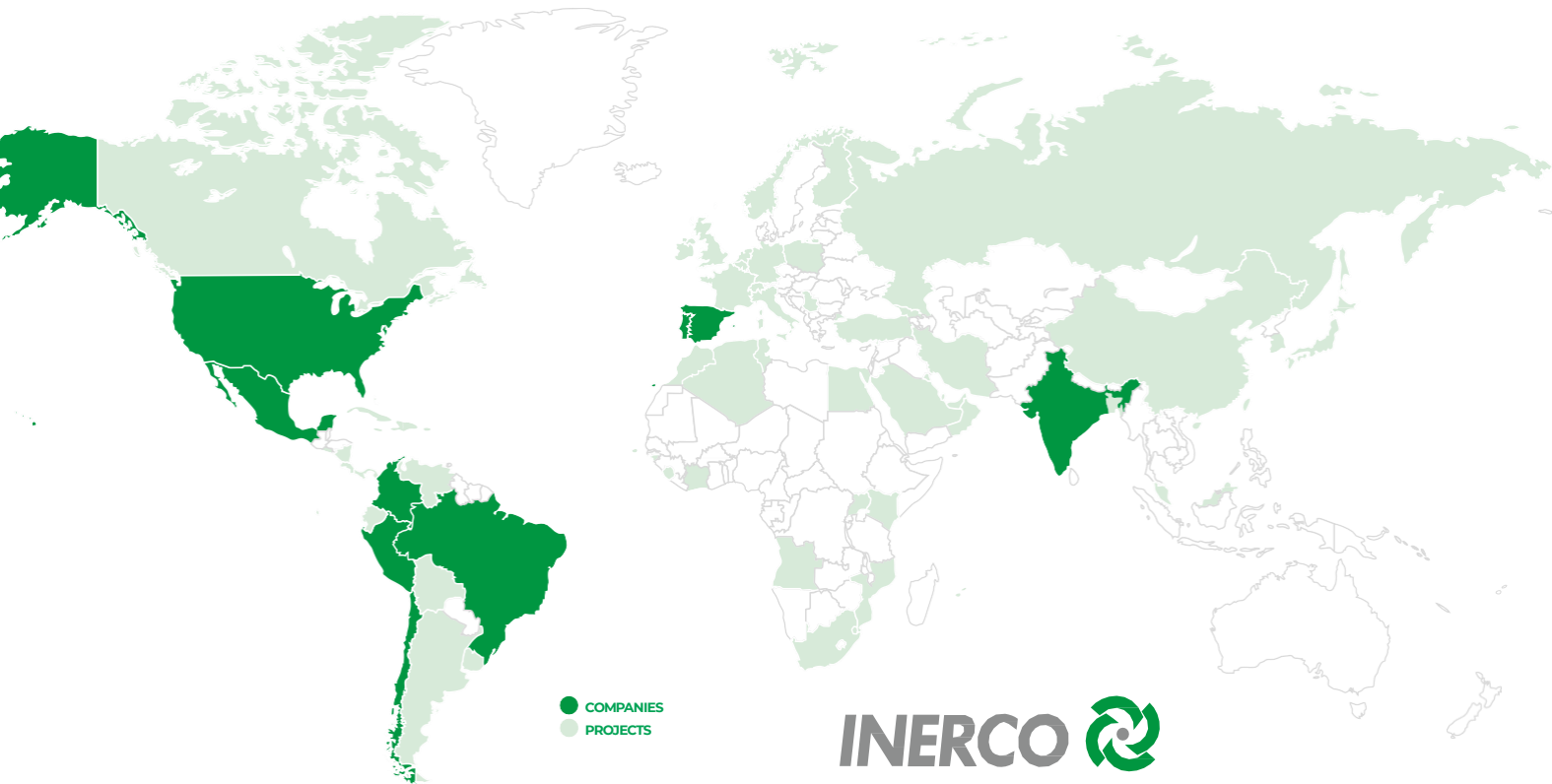


EXECUTIVE SUMMARY

- ABACO-Opticom: automatic monitoring and control system of local combustion conditions at the boiler walls or in the flame envelope of each burner
- Direct measurement of actual in-furnace gas concentrations (O_2 , CO , NO_x , CO_2 , SO_2)
- Advantages of using ABACO-Opticom:
 - Real results based on information taken from selected in-furnace points

- No averaged values. No interpolation software (a main difference with other systems)
- Results are easy to understand and process
- Not affected by fuel typology, dirtiness or optical-path alignment
- Measured and actionable information to:
 - Guide the operator
 - Optimize combustion tuning
- Profitability: combined NO_x and efficiency improvement, carbon-in-ash reduction and control/minimization of corrosion and slagging





● 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 - Ferial - 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