



Engineering and technologies for industrial combustion

Customized solutions designed to improve the efficiency, flexibility and reliability of thermal processes.

Combustion solutions for a wide range of industrial processes

Experience applied to different operations and thermal conditions, with solutions developed for the needs of each industry.



Fertilizers



Steelmaking



**Cement and
Lime**



**Sugar and
Ethanol**



Petrochemicals



Mining



Metallurgy



Pulp and Paper

Customized engineering and equipment for processes requiring efficiency, stability and fuel flexibility.

Integrated engineering across the project lifecycle

FLAME brings together process expertise, customized development, equipment and technical support to meet the specific conditions of each plant.



FLAME INTEGRATION

Process, fuels, engineering and equipment connected in one integrated solution.

Engineering and support throughout the entire project lifecycle

Continuous support from the initial assessment through maintenance and modernization of systems in operation.

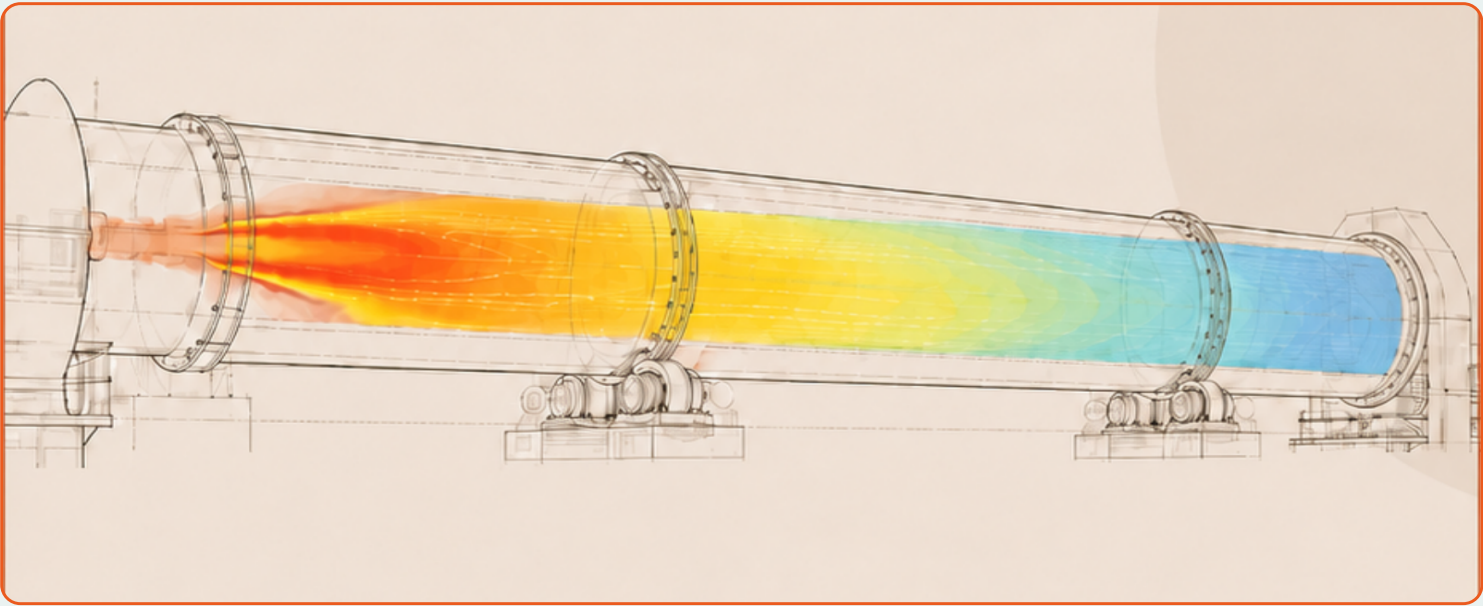


CONSULTING AND ENERGY TRANSITION

Assessment of costs, availability, thermal performance, safety and operational impacts to support decisions on new fuels.

CFD simulation applied to industrial combustion

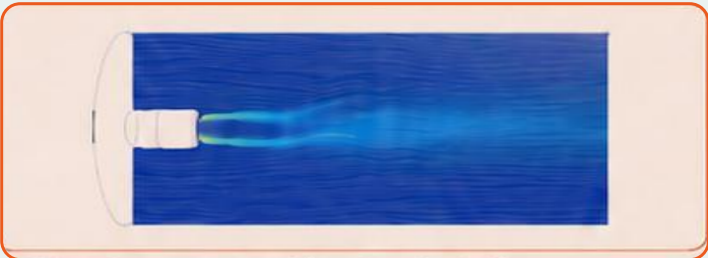
Computational modeling to assess flow, mixing, combustion, heat transfer and thermal behavior in industrial systems.



Temperature distribution and flame development in a rotary kiln



Chemical species distribution and NOx assessment



Streamlines and recirculation regions



Particle trajectories and residence time

MAIN APPLICATIONS

- Flame evaluation, thermal profile and regions of highest thermal intensity
- Analysis of air/fuel mixing, velocity distribution, recirculation and instabilities
- Assessment of solid, liquid, gaseous and alternative fuels
- Optimization of burners, kilns, calciners, dryers and combustion chambers
- Chemical species and atmospheric emissions analysis, with emphasis on NOx

OPERATIONAL DIAGNOSTICS

Identification of critical regions of temperature, velocity, mixing, recirculation and heat transfer.

SCENARIO COMPARISON

Evaluation of alternatives in flow rate, geometry, primary/secondary air, fuel and operating conditions.

ATMOSPHERIC EMISSIONS

Analysis of chemical species and regions favorable to NOx formation, supporting adjustments and operating decisions.

FLAME INTEGRATION

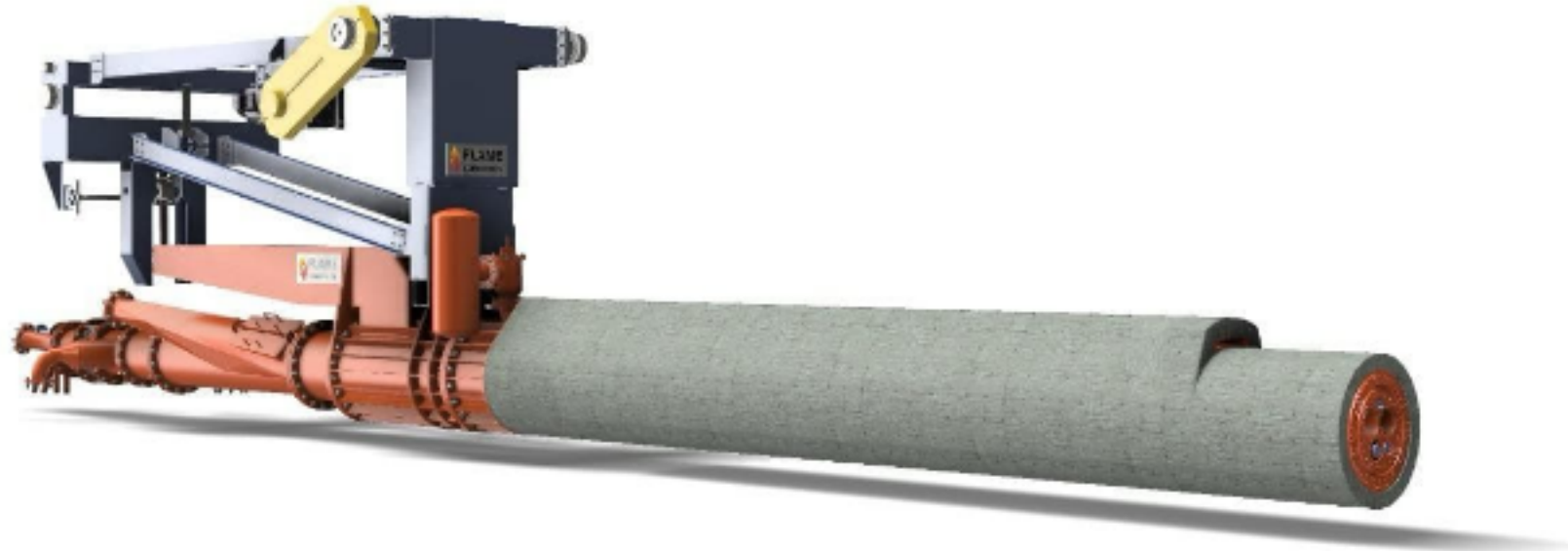
Combination of computational modeling, field experience and know-how in industrial combustion systems.

CFD does not replace operational validation. It strengthens engineering and reduces uncertainty.

Combustion engineering supported by CFD.

Simulation guides technical decisions; operational validation confirms performance.

SMART FLAME adapts the flame to the kiln, product and fuel



SMART FLAME

Rotary kiln burners with three individually controlled adjustment air flows, designed to provide flexibility in flame shape and characteristics.

- Up to 150 Gcal/h
- Multi-fuel operation
- Pulverized solids, liquids, gases and waste-derived fuels
- Local adjustment or automated remote operation
- Applications in gray clinker, white clinker, lime and pozzolana

Operational flexibility while maintaining efficiency, emissions control and process stability.

SMART CAL FLAME delivers combustion in the optimal process zone



SMART CAL FLAME

Customized burners for preheater towers and calciners, designed to promote intensive mixing between gases and fuels.

- Conventional and alternative fuels
- SLC, ILC, RSP, DDF and other applications
- Lower CO and greater process stability
- Build-up formation control
- Simplified installation and maintenance
- Configuration for DeNOx operation

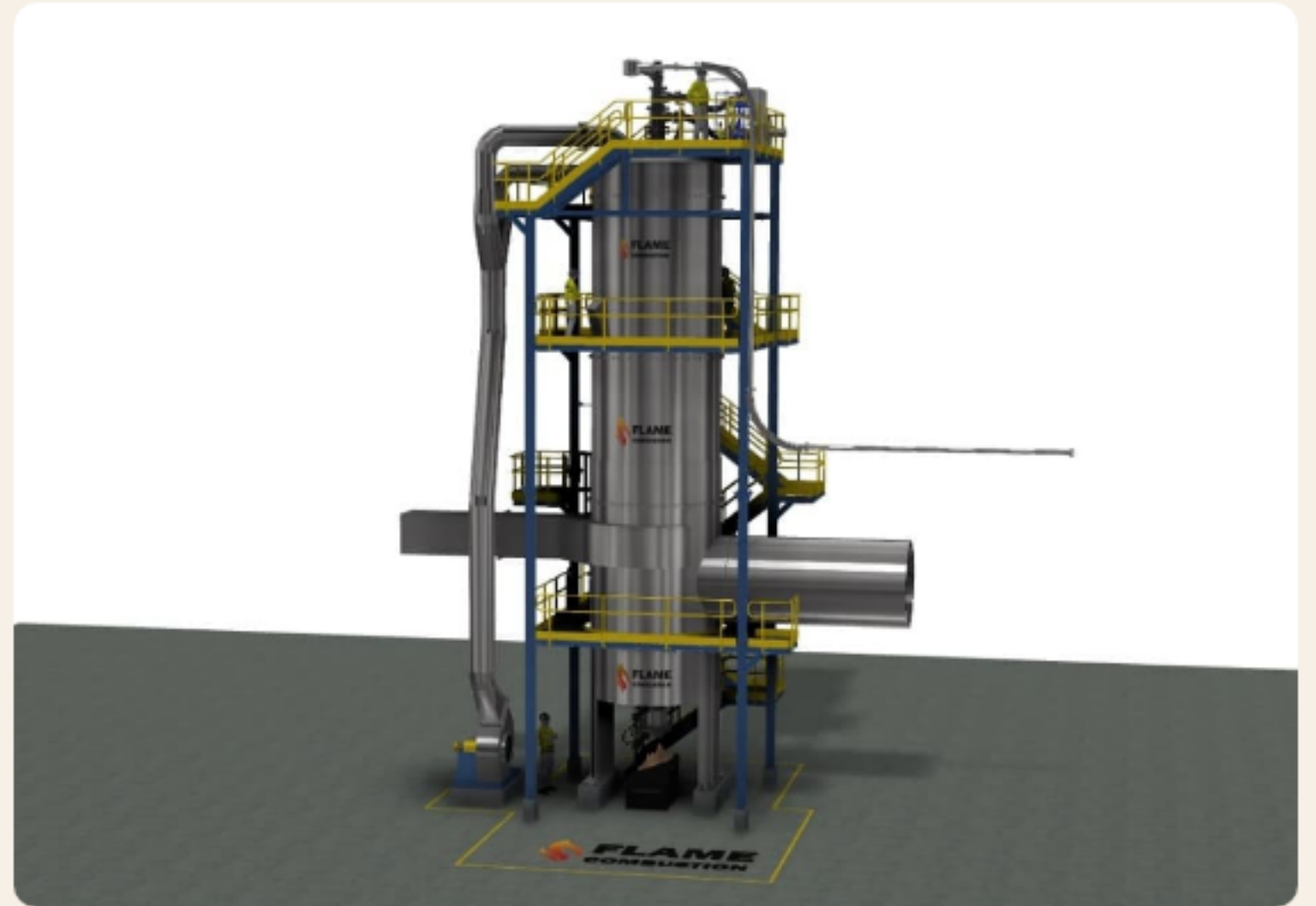
Technology operating in several countries, with development supported by CFD simulations.

SMART FLAME HGG supplies hot gases under the conditions required by the process

SMART FLAME HGG

Direct-fired generators customized for flow rate, temperature, recirculation and operating mode.

- Up to 50 Gcal/h
- Vertical or horizontal body
- Up to 100% pulverized solid fuel
- Continuous flame supervision
- Automated operation and redundant safety systems
- Applications in fuel and raw meal grinding, and slag or ore drying



Also suitable for modernizing existing generators and converting them to lower-cost fuels.

SMART HANDLING SYSTEMS integrates fuel handling with plant control



SMART HANDLING SYSTEMS

Customized systems for fuel handling, dosing, storage, conveying, control and monitoring.

- Solid, liquid and gaseous fuels
- Valve trains and pressure-reduction stations
- Filtration, pumping and heating
- Dosing and pneumatic conveying
- Silos, tanks, PLC and HMI
- Integration with existing facilities
- Compliance with NBR, NFPA and DIN standards

For gases, configurations up to 72,000 Nm³/h - higher flow rates available upon request.

Spare parts preserve system reliability and operational continuity

Customized components for maintenance, modernization and the continued operation of industrial combustion systems.



SPARE PARTS & COMPONENTS

Supply tailored to the specific conditions of each piece of equipment and process.

- Internal burner components
- Burner heads and combustion chambers
- Pipes, distributors and injection elements
- Parts for maintenance, retrofits and upgrades

Compatibility, operational reliability and extended equipment service life.

Experience recognized by leading industrial groups

Companies served by FLAME





DIRECT CONTACT

Let us understand the process before proposing the solution.

Talk directly with the team best suited to your project needs.



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