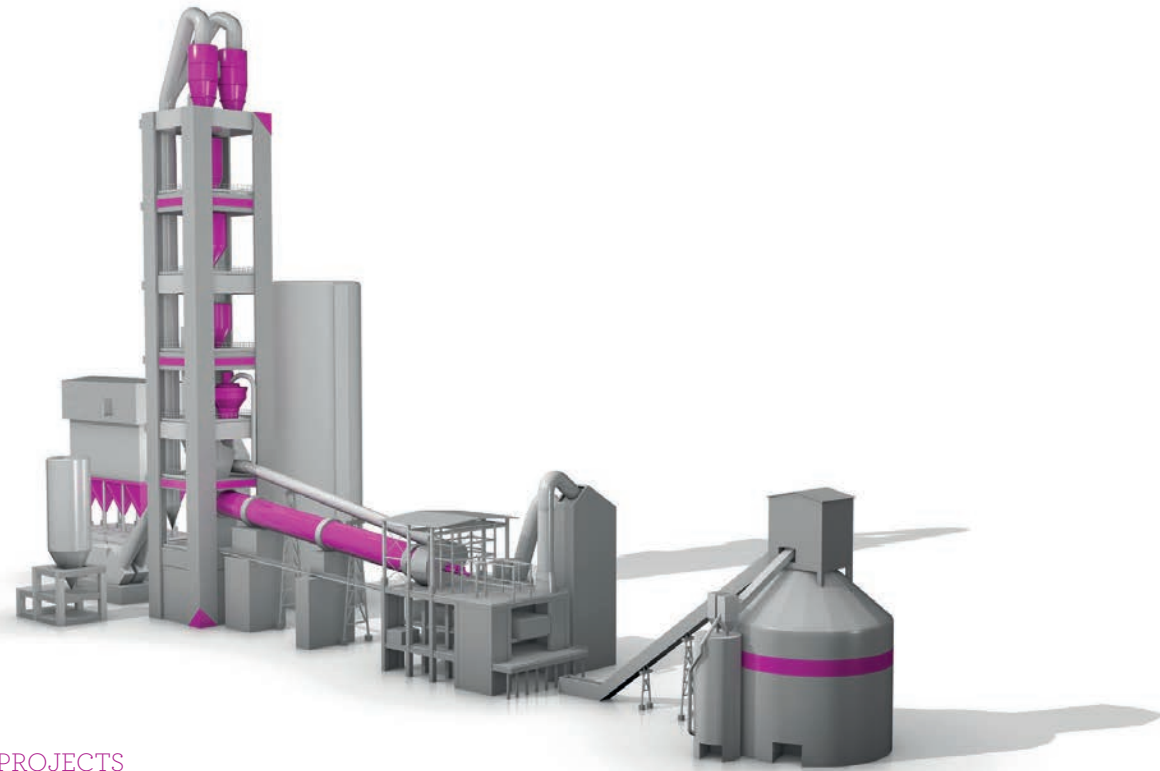


Fives offers customized and pioneering solutions to meet customers' needs

# Burning Lines



## ENGINEERING & PROJECTS

- Research & Testing center
- Design & Engineering
- Process & Mechanical expertise
- Equipment supply
- Civil works, Erection & Commissioning
- HSE & Quality commitments

## ADVANCED TECHNOLOGIES

### Crushing

- FCB Rhodax®
- FCB VIF™ Crusher

### Grinding

- FCB Rhodax®
- FCB Horomill®
- FCB B-mill
- FCB E-mill
- FCB TSV™ Classifier
- FCB Flash dryer

### Pyroprocessing

- FCB Preheater
- FCB Zero-NOx Preca
- FCB Kiln
- FCB By-pass system

### Combustion

- Pillard NovaFlam®, PrecaFlam™ and RotaFlam® burners
- Pillard Fuel Handling Systems
- Pillard HeatGen
- Pillard Neutrinox™
- Pillard Control System

### Gas Treatment

- TGT® Filter
- Sonair™ Filter
- All-Dry Injection System
- EAD™ Dry Scrubbing System

### Control & Optimization

- COSMA™
- FCB Opti-HRM™
- FCB Opti-Bmill™
- FCB Opti-Kiln™
- FCB Opti-RMX™

## SERVICES

### Operation

- Spare parts
- Hot & cold kiln alignment
- Mechanical audit
- On-site machining
- Mechanical works supervision
- Technical Services Agreement

### Evolution

- Mechanical revamping
- Kiln seal replacement
- Kiln shell sections and tyres replacement
- Grinding plant modernization
- Pillard Control System

### Optimization

- Process optimization systems



With a high-level process expertise, Fives supplies customized and high-performance pyroprocessing solutions

Complete burning lines integrating proprietary equipment that provide:

- Heat efficiency
- Low emission levels
- High proportion of coarse alternative fuels
- Alkali control with FCB By-pass system
- Stable & optimized operation and energy savings

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## CONTACT US

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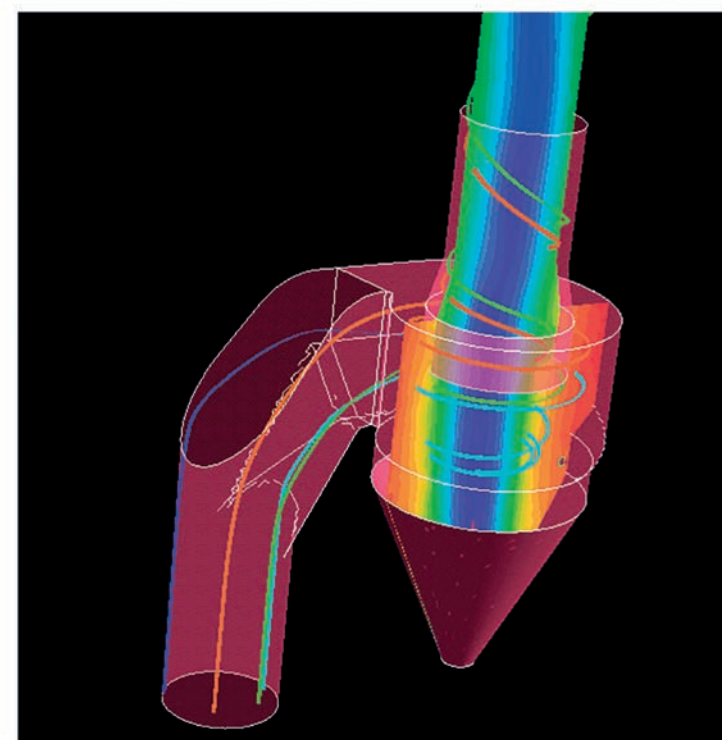
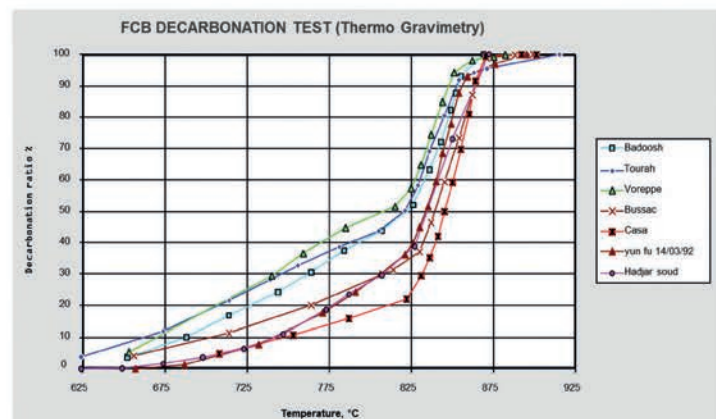
From process design and equipment supply to complete turnkey execution, Fives delivers all types of projects, either greenfield, brownfield or modernization



**PROCESS EXPERTISE COMBINED WITH A BROAD KNOWLEDGE IN MECHANICS**

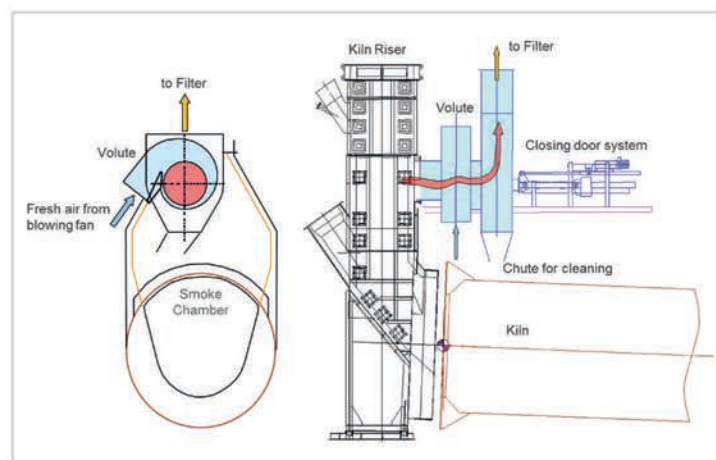
Adequate sizing of the equipment for pyroprocessing requires a full and perfect knowledge of the raw meal characteristics and behavior.

Fives has developed laboratory methods well adapted to the evaluation of raw materials, using DTA and GTA measurements. Pilot scale models and 3-D flow calculations are carried out to design and optimize Fives equipment, such as the FCB Zero-NOx Preca and the low pressure drop and high separation efficiency cyclones.



**ALKALI BY-PASS**

Kiln fumes by-pass extraction performs a strong quenching of the gases with fresh air. It can be followed by hot filtration (400°C) or by a second cooling before a bag filter (160 to 240°C). Fives has installed alkali by-pass systems in many cement plants, where extraction rates range from 8% to 50%.



From design and equipment supply to commissioning, Fives offers complete burning lines that integrate proprietary technologies, for both grey and white cement productions:

- FCB Kilns on 2 or 3 piers
- FCB Zero-NOx Preca
- High efficiency and low pressure drop FCB Preheater
- Combustion solutions: Pillard NovaFlam®, Pillard RotaFlam® and Pillard PrecaFlam™ burners
- Alternative fuel preparation and feeding systems

- Alkali by-pass: FCB By-pass system and pioneering dust treatment system
- Process filters: SONAIR™, TGT®
- Polluting emission abatement systems: EAD™ Dry Scrubbing Systems, Pillard Neutrinox™
- Process optimization system: FCB Opti-Kiln™

Fives also provides associated services to optimize the performance of installations throughout their lifecycle:

- Maintenance and upgrade of kilns of all make
- Kiln parts and accessories
- Kiln hot and cold laser alignment
- Expertise and optimization of kiln performances

With over 80 years of experience in industrial engineering and contract execution, Fives has proven operational excellence in dealing with major projects worldwide

**White cement**



**Minya - Helwan Portland Cement Co (Egypt)**  
750 tpd with Precalciner & Spray cooler



**Muzahmiah - Saudi White Cement Co. (Saudi Arabia)**  
1,000 tpd with Precalciner & Dual cooler

**Grey cement**



**Cartago & Hermosillo - Holcim (Costa Rica & Mexico)**  
3,000 & 3,500 tpd - Petcoke & Alternative Fuels



**Umm Bab - Qatar National Cement Co. (Qatar)**  
2,000/4,000/2 x 5,000 tpd with Alkali by-pass - Natural gas



**Beni Suef - Titan/Beni Suef Cement Co (Egypt)**  
4,000 tpd with 50% Alkali by-pass  
Gas or fuel oil



**Tula - Lafarge (Mexico)**  
1,500 tpd extendable to 3,000 tpd  
Petcoke or Coal



**Thai Nguyen - Vinaincon (Vietnam)**  
4,000 tpd - Anthracite coal