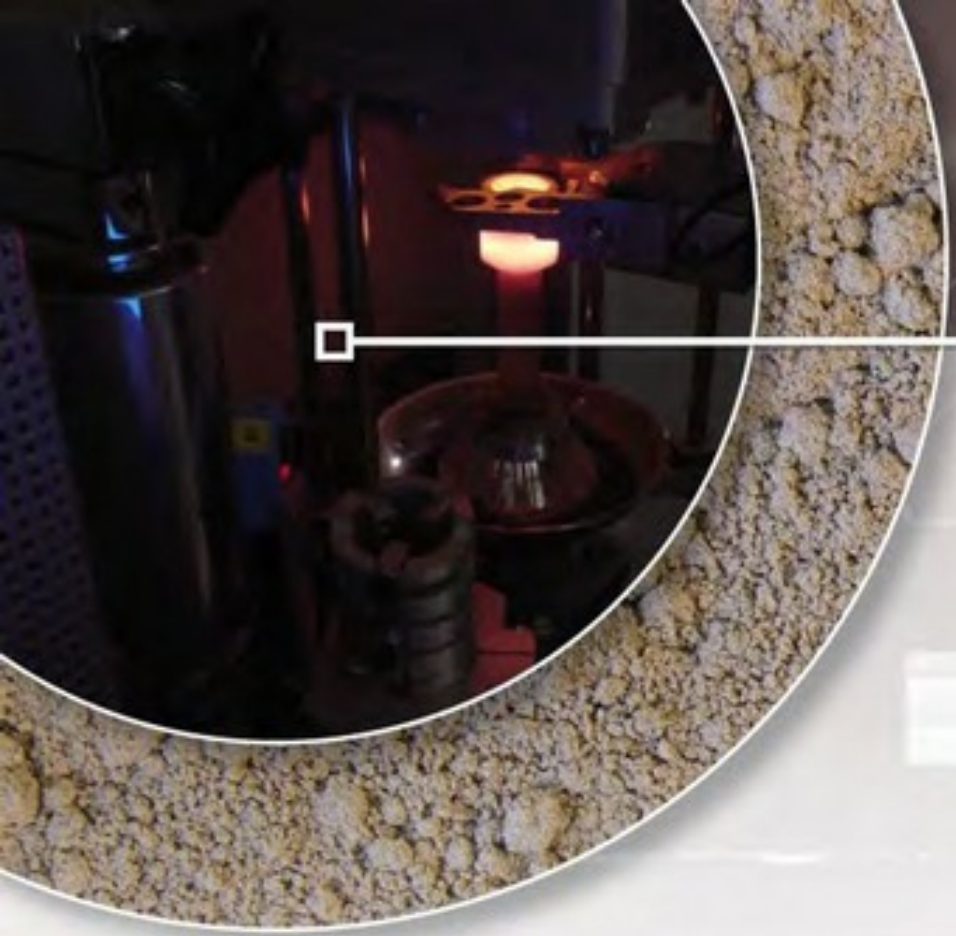

ITECA
SOCADEI
CEMENT DPT

Process Control & Energy Efficiency

Representative **Sampling Systems**

Sample **Transport** & **Preparation**

Centralised Laboratory **Autolab**

On line / At line **Analysers**

Efficient Kiln **Seals**

Grinding Media **Sorting Machines**

INTERNATIONAL NETWORK

ITECA : **I**nnovation **T**echnique **E**quipement **C**apteur **A**utomatisme

SOCADEI : **SOC**iété d'**A**pprovisionnement et de **DE**veloppement **I**ndustriel

Made in France

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FRANCE
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+ 33 (0)4 42 97 77 33
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Many references Worldwide

Europe - North, Central & South America - Asia - Middle East - Africa

ITECA SOCADEI CEMENT DPT

ITECA SOCADEI - TODAY

THREE DEPARTMENTS

- More than 40 years of experience in mineral industries
- Active in more than 95 countries
- More than 65 people
- 2 Engineering Dpt : Electrical/Automation & Mechanical
- 2 subsidiaries: India & China
- 3 Departments :

Cement

- ✓ **Sampling**, **transport**, **preparation** & sample **analysis** (at line or centralised)
- ✓ Kiln **seals**
- ✓ Grinding balls **sorting machine**
- ✓ **Gas sampling** & **analysis** at kiln inlet

Color & Vision

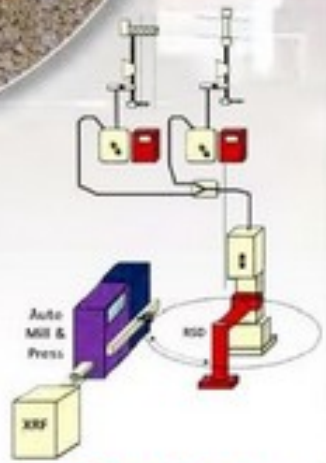
- ✓ **On line** Quality **control** & non conformity **detection** through **colour** analysis
- ✓ **Crystallization** control (sugar plants)
- ✓ **Particle size** analysis

Bulk Solids - Mineral industry

- ✓ **Sampling** solutions
- ✓ **Instrumentation**: level measurement, clogging detection, etc.
- ✓ **Loading** solutions

CEMENT & BULK SOLIDS DEPARTMENT

SOLUTIONS



Chemistry

Loss On Ignition

Free Lime

Carbon - Sulphur

Particle Size

RAW MEAL → HOT MEAL → CLINKER → CEMENT

Grinding balls sorting machine

Kiln Inlet Seal

Gas Monitoring

Kiln Outlet Seal

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CEMENT & BULK SOLIDS DEPARTMENT

FROM SAMPLE TO ANALYSIS

- Samplers
- Sampling tower
- Sample transport
- Sample Preparation
- Automatic Analysis
- Centralised lab Autolab

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SAMPLING SYSTEMS

SEMI AUTO

Raw Materials of Limestone or Clinker

Linear bucket sampler
EGTR

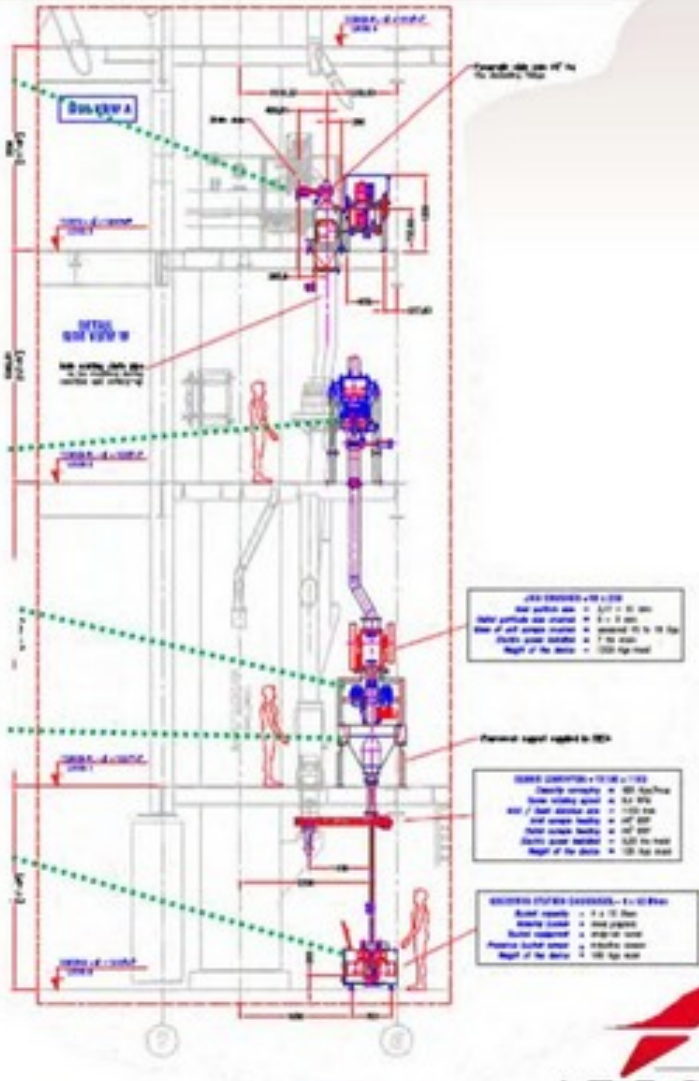
Primary sampler

Screen

Crusher

Divider

Sample storage



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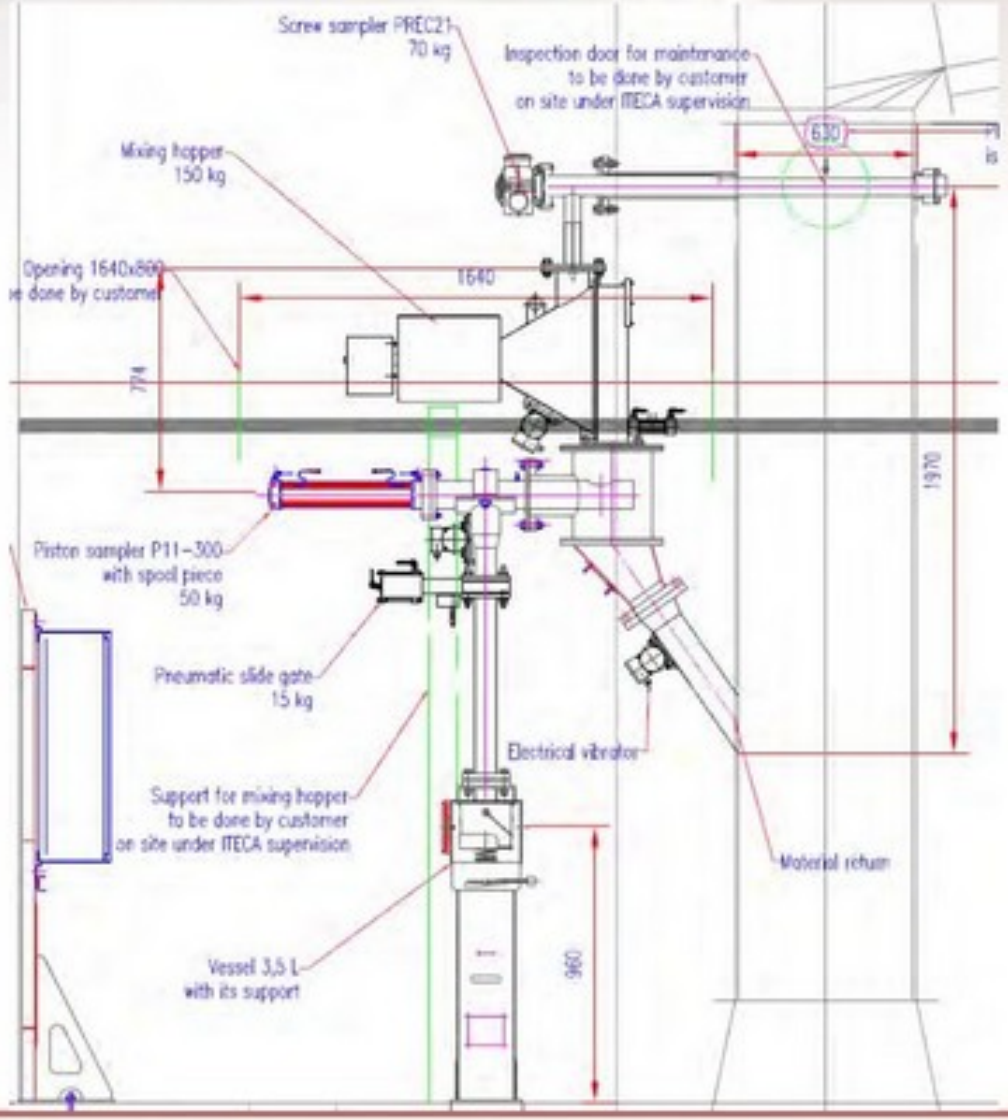
SAMPLING SYSTEMS

SEMI AUTO

Composite Sample in chute



Raw meal, Kiln Feed, Cement,
Coal, Kiln Dust…

With return of residues by gravity
(chute > 1,7 m)

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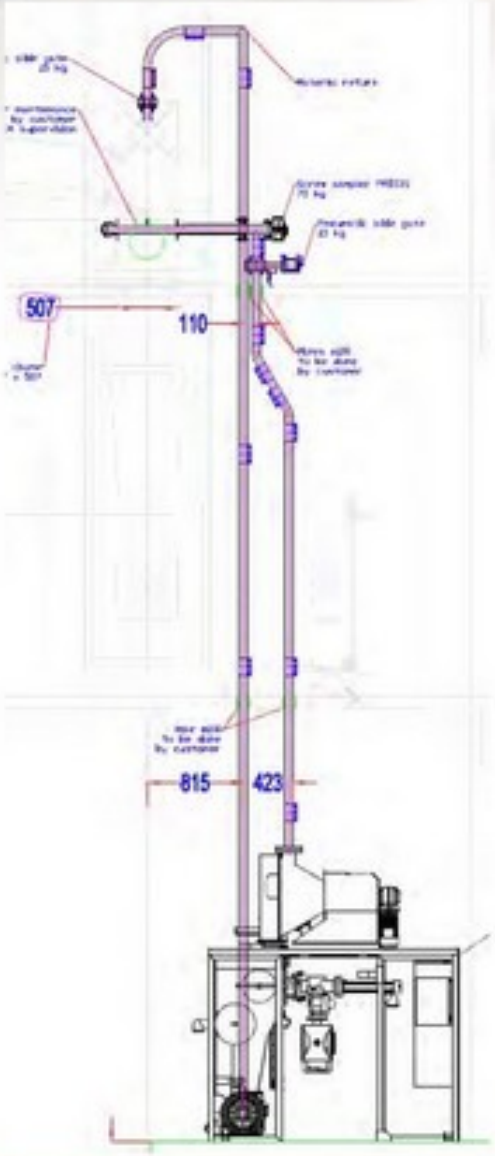
SAMPLING SYSTEMS

SEMI AUTO

Composite Sample in chute



Raw meal, Kiln Feed, Cement, Coal, Kiln Dust…

With Pneumatic Residues Evacuation (PRE) system for excess material (chute < 1,7 m)

Skid T1

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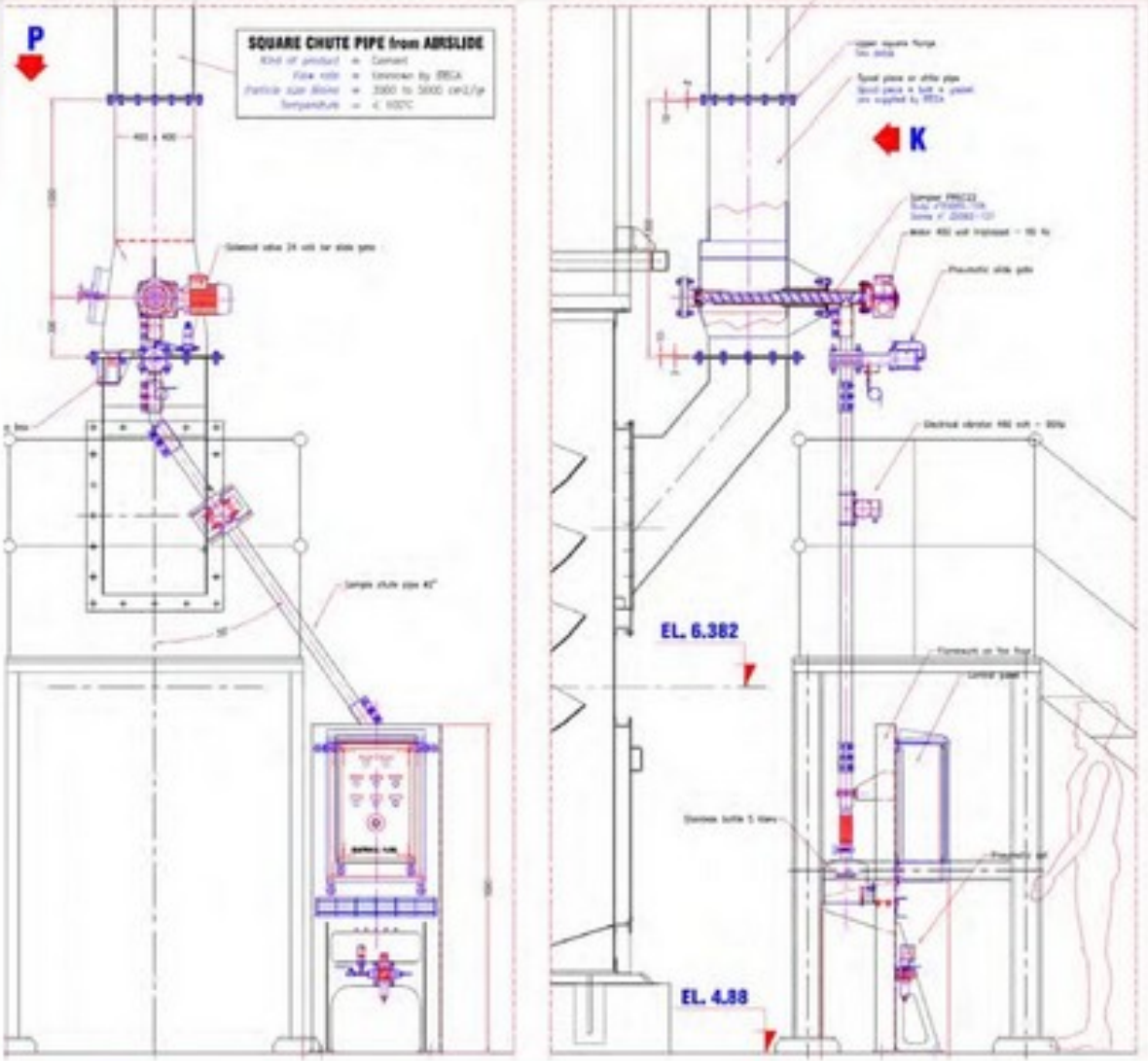
SAMPLING SYSTEMS

SEMI AUTO

Spot Sample in chute



Cement, Coal, Kiln Dust…

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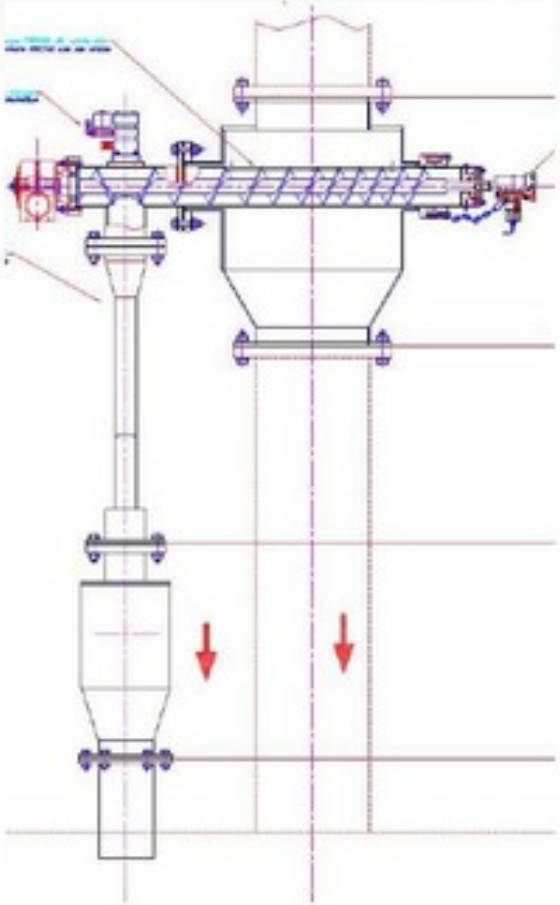
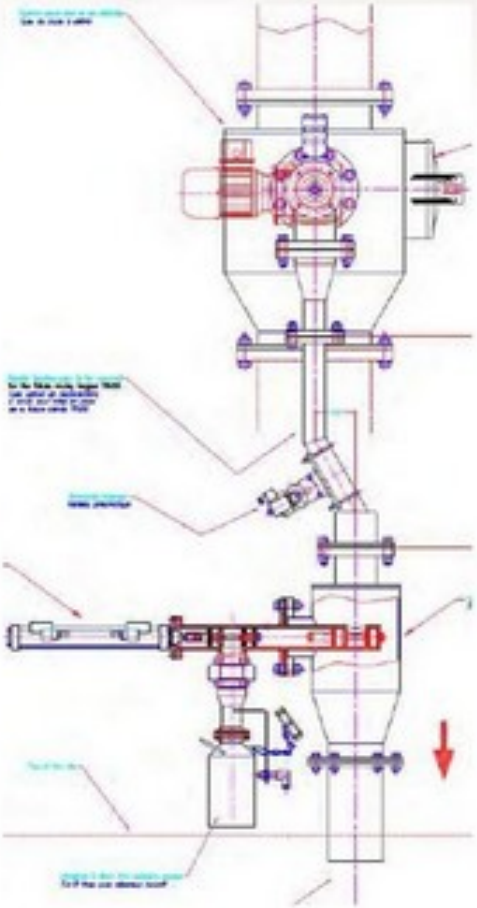
SAMPLING SYSTEMS

SEMI AUTO

Spot Sample in chute





Cement, Coal, Kiln Dust…

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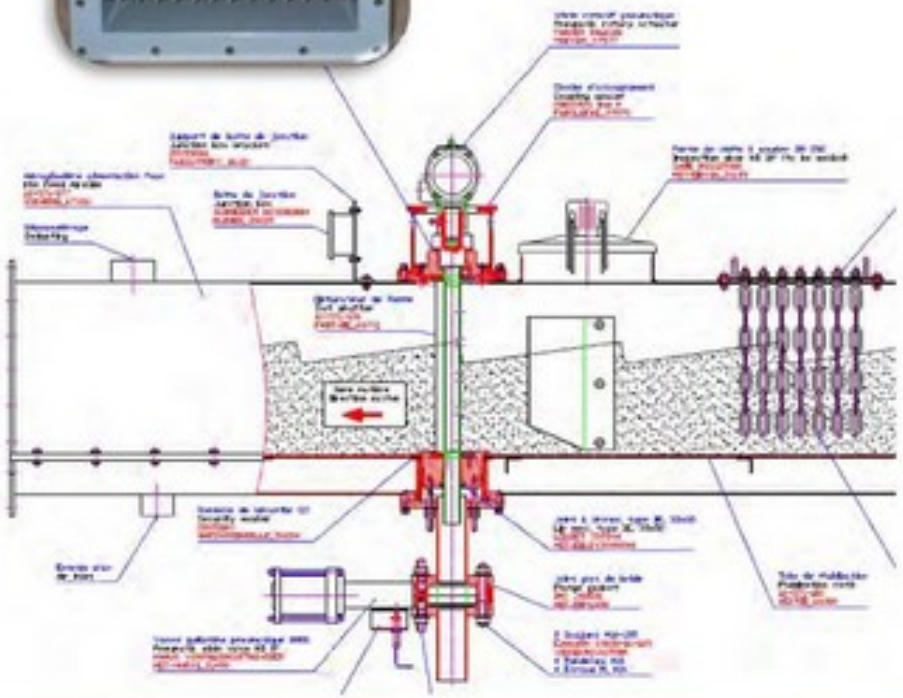
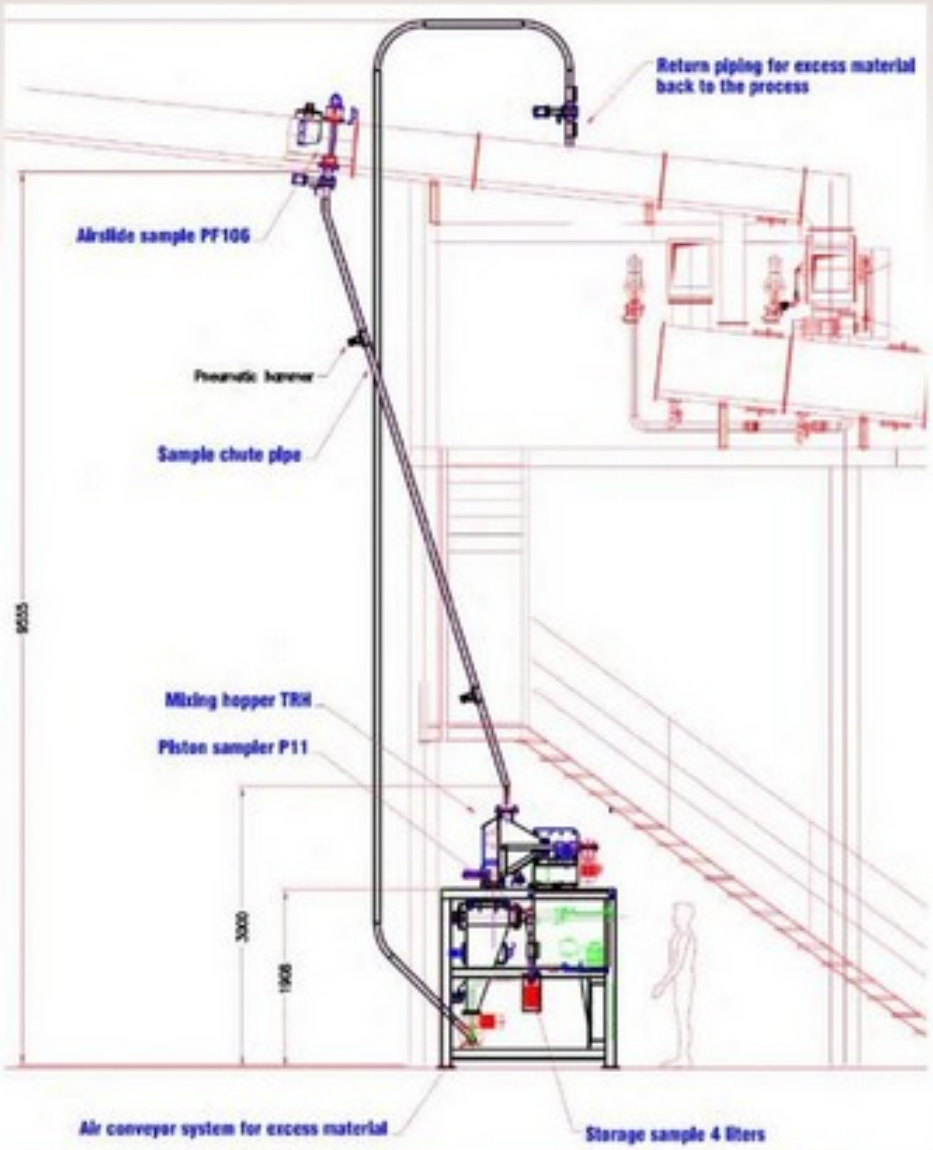
SAMPLING SYSTEMS

SEMI AUTO

Composite Sample in airslide

Raw meal, Kiln Feed, Cement …



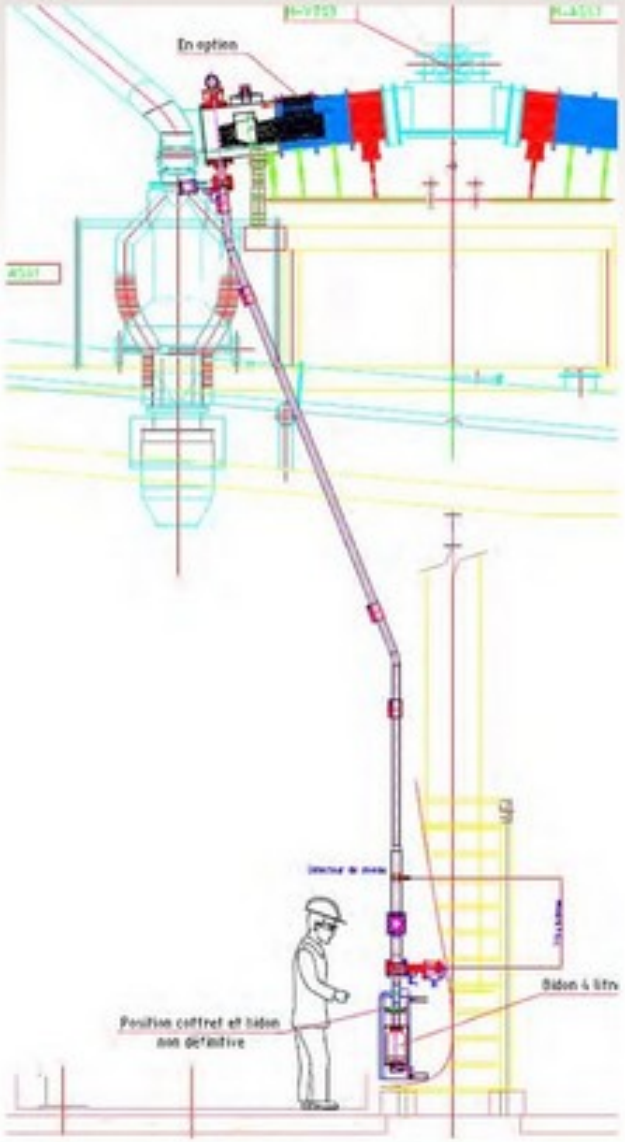


SAMPLING SYSTEMS

SEMI AUTO

Spot Sample in airslide

Kiln Feed,
Cement …



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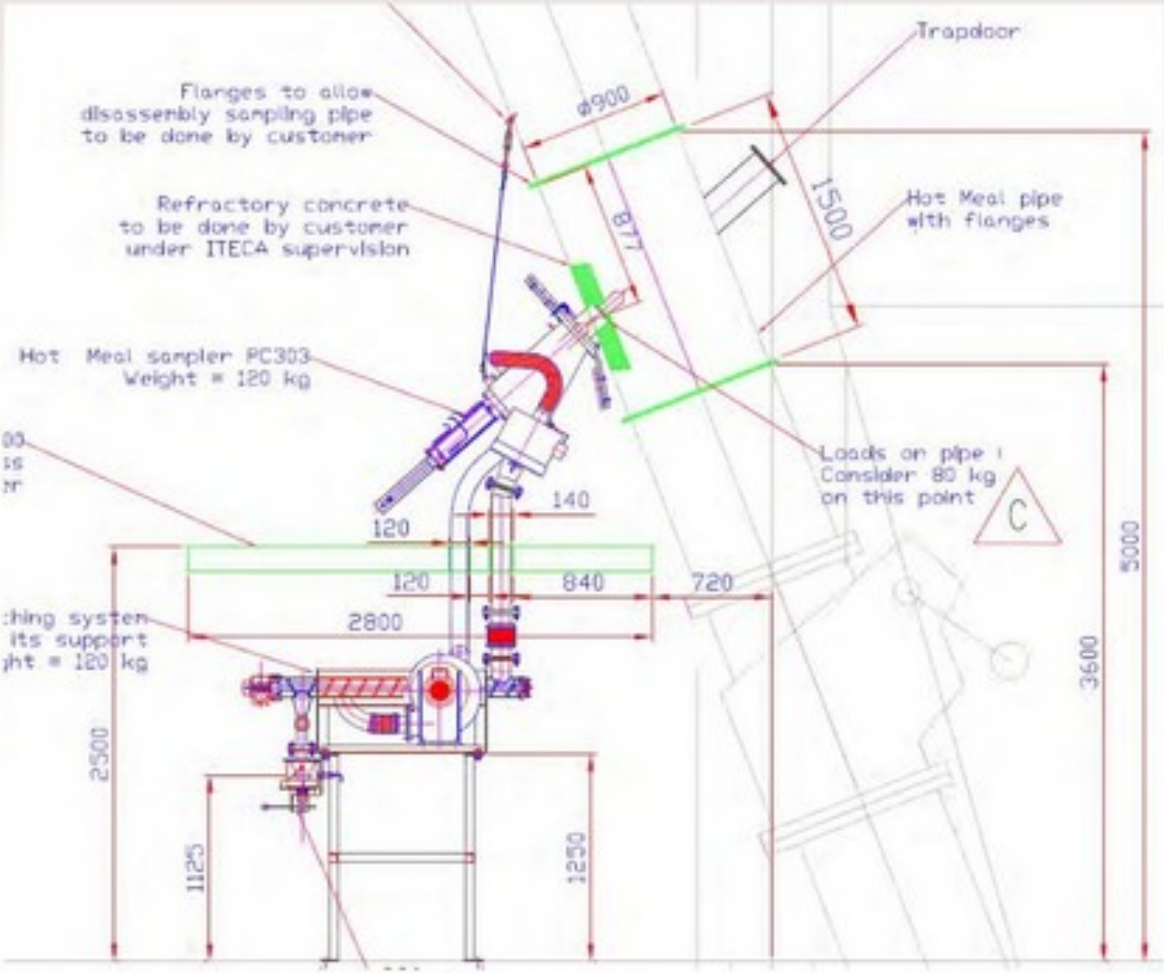
SAMPLING SYSTEMS

SEMI AUTO

Hot Meal



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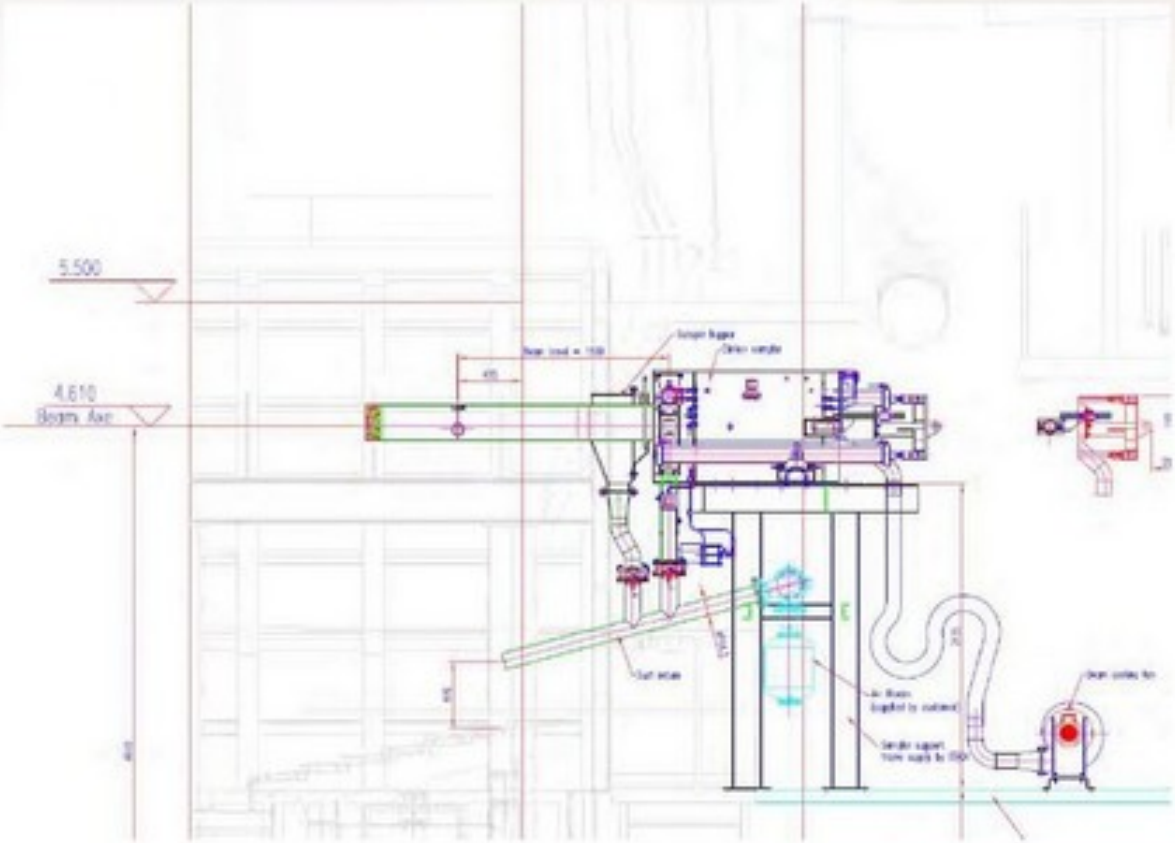
SAMPLING SYSTEMS

SEMI AUTO

Clinker at kiln discharge



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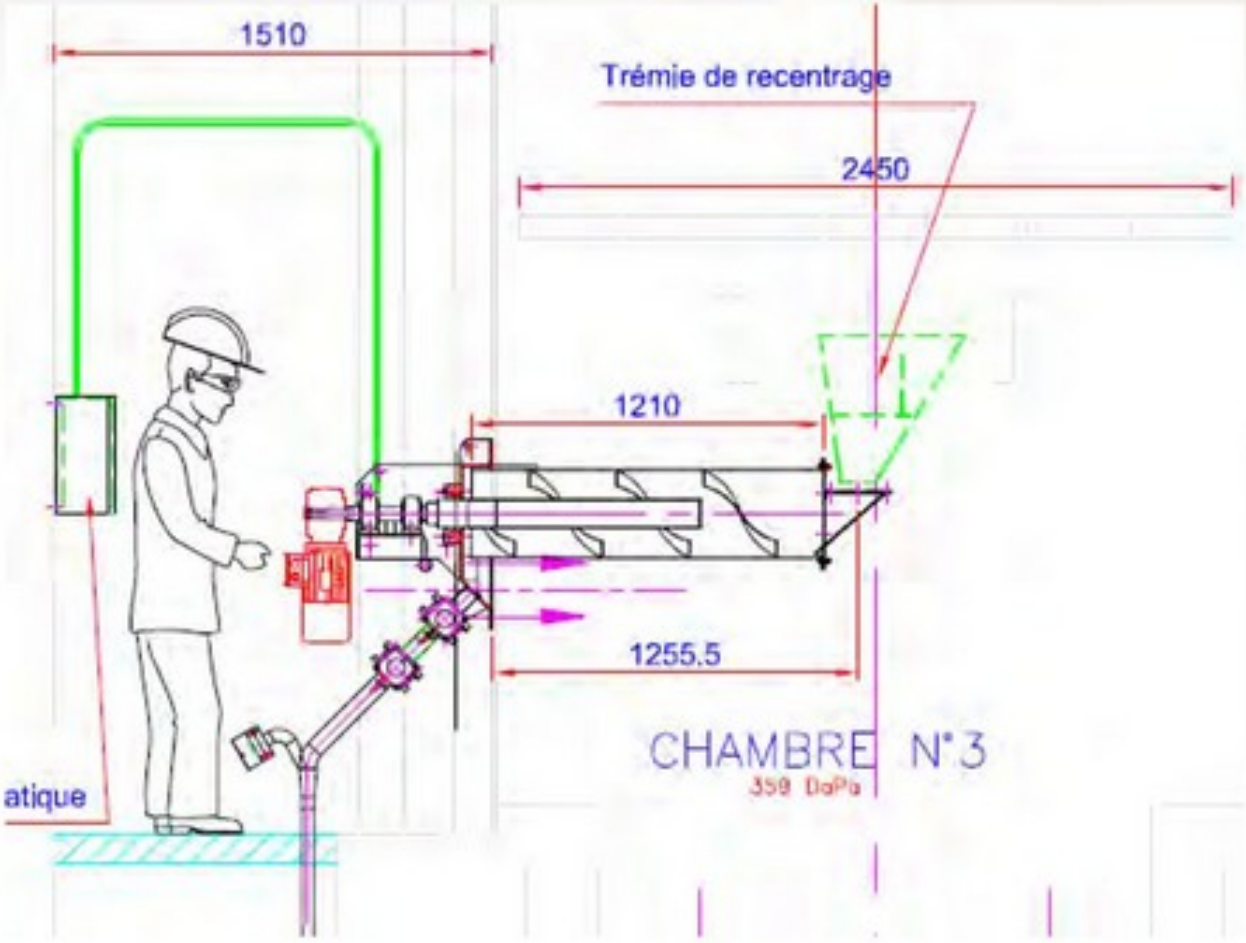
SAMPLING SYSTEMS

SEMI AUTO

Clinker under the cooler's grates



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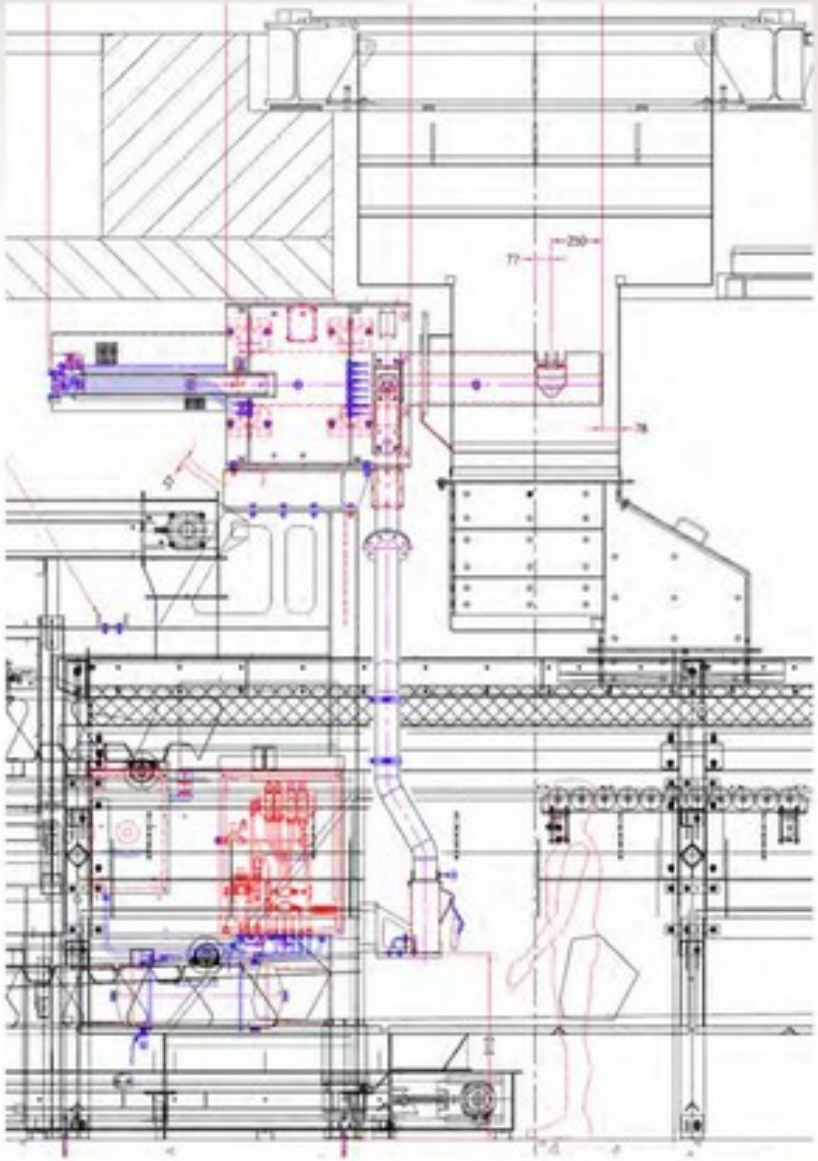
SAMPLING SYSTEMS

SEMI AUTO

Clinker at cooler discharge



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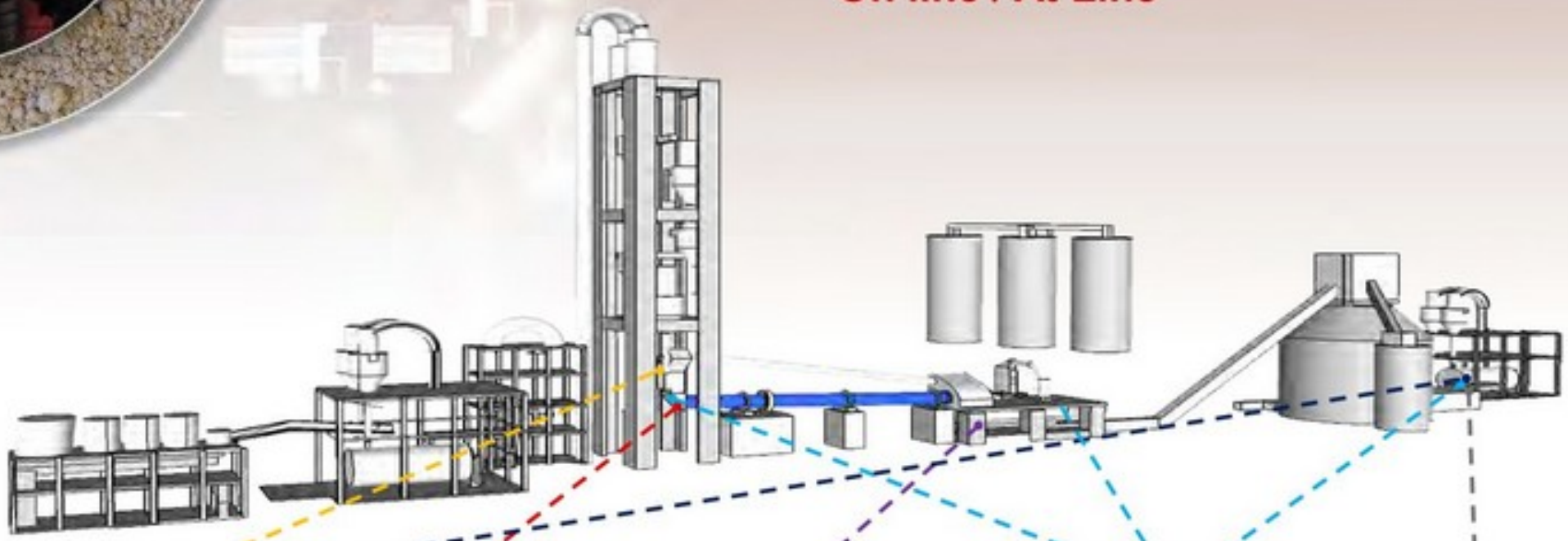
ANALYSERS FOR PROCESS CONTROL

On line / At Line



PF1
Loss on Ignition
2 /h

AGO2
Gas Sampling & Analysis
Continuous

KLC3
Free Lime
4 /h

CO_2/SO_3
Carbon Sulphur
6 /h

Insitec
Particle Size
Continuous

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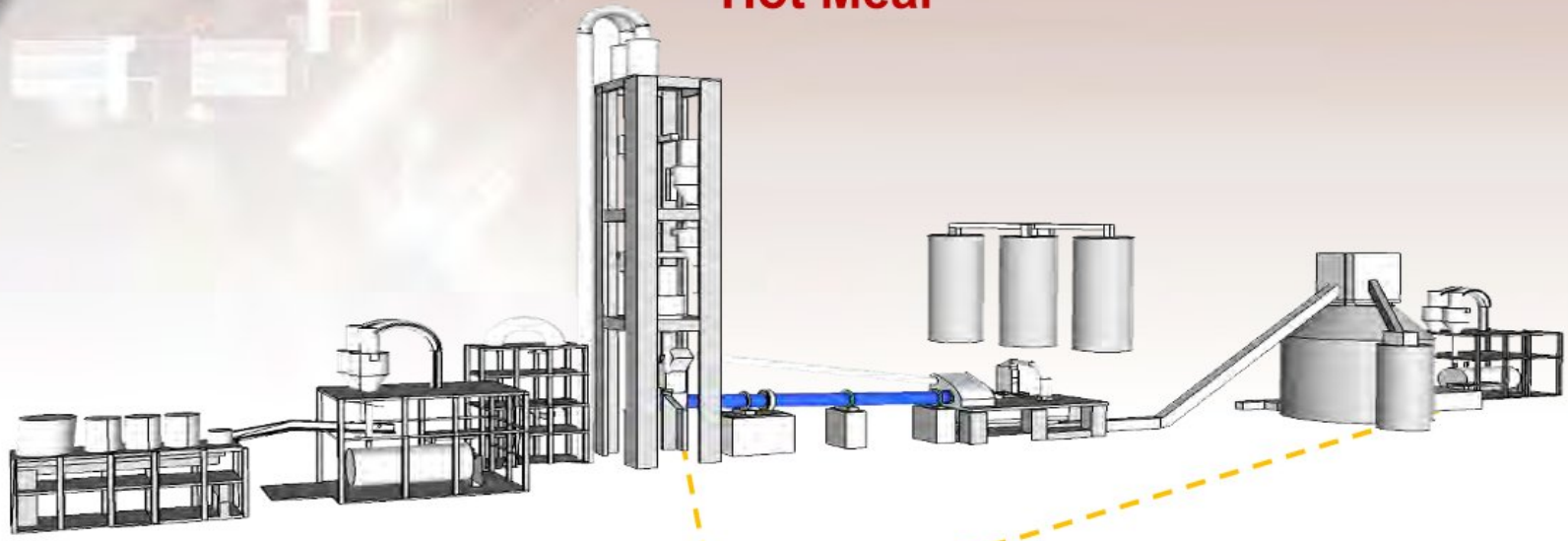
ON LINE PROCESS CONTROL

Hot Meal



To plant PLC : LOI rate

OR

Limestone rate (cement application)

Analyser PF1

Loss on Ignition analysis

2/h

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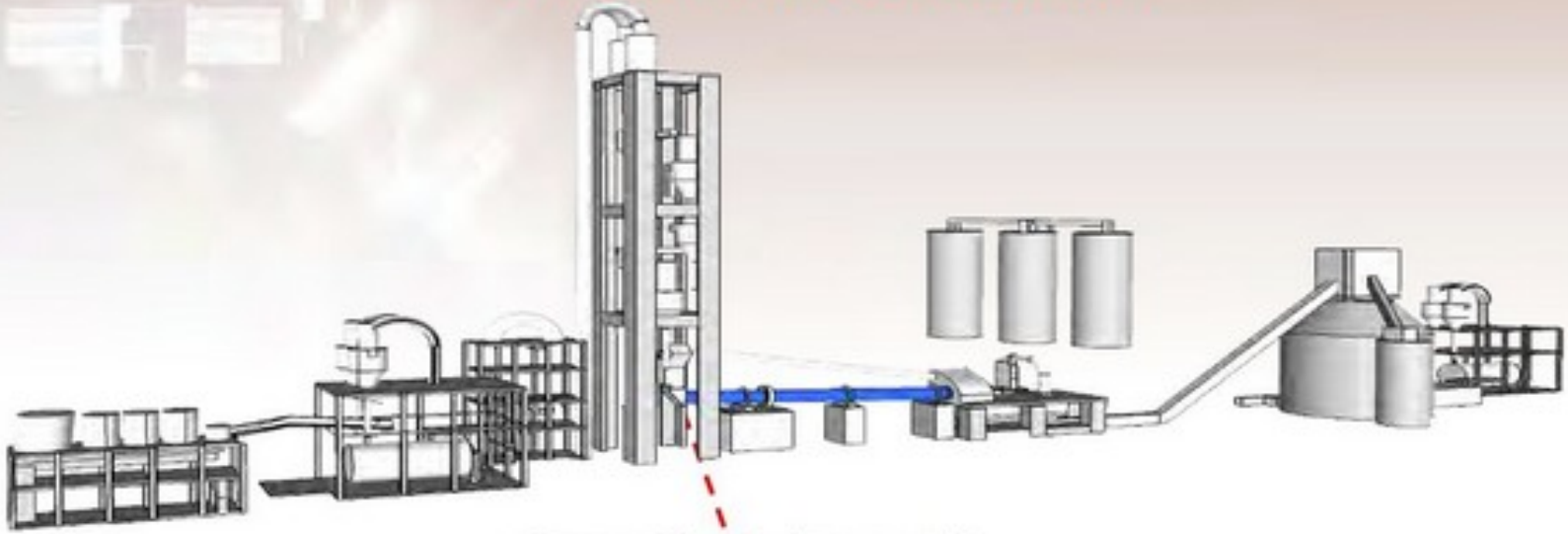
ON LINE PROCESS CONTROL

Gas Sampling at kiln inlet



To plant PLC : gas composition (CO, NO, CH_4, O_2, etc.)

Analyser AGO2

Kiln gas composition

Continuous

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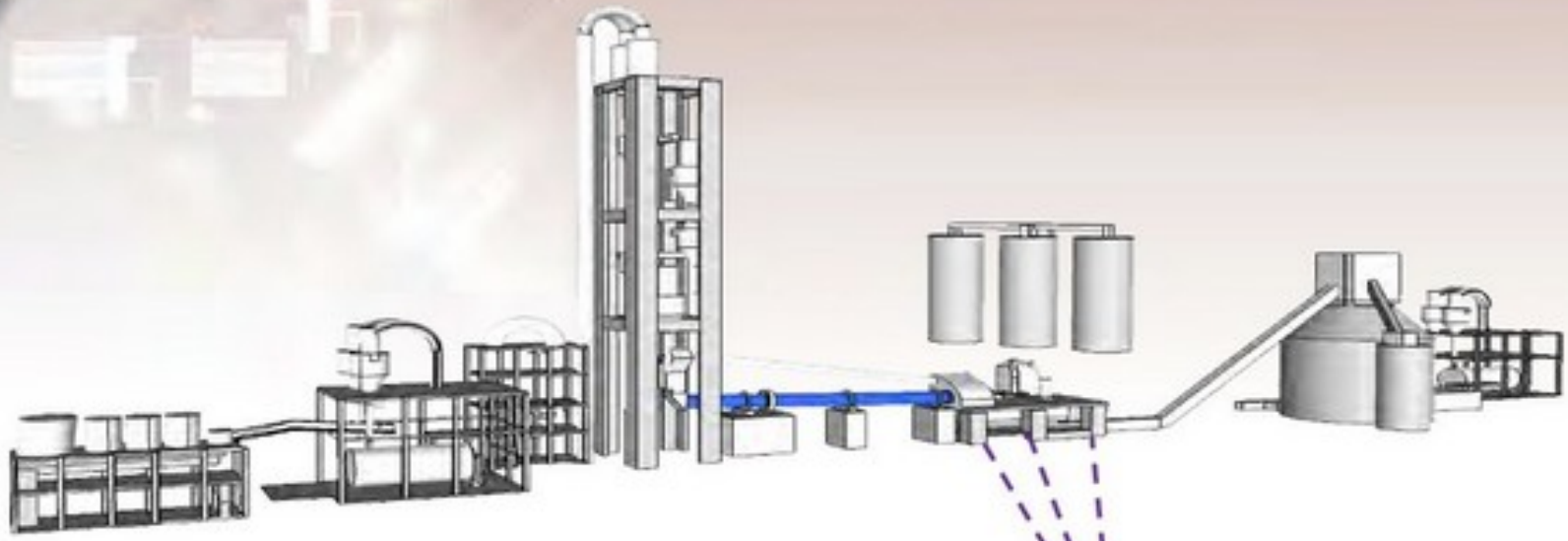
ON LINE PROCESS CONTROL



Analyser KLC3

Free Lime

4/h

To plant PLC : free lime rate

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ON LINE PROCESS CONTROL

Cement

Analyser
CO2 SO3

Carbon Sulphur

6/h

Analyser
INSITEC

Particle size

Continuous

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CENTRALISED AUTOMATIC LABORATORY

AUTOLAB

Semi Auto
Full Auto
or **Hybrid**

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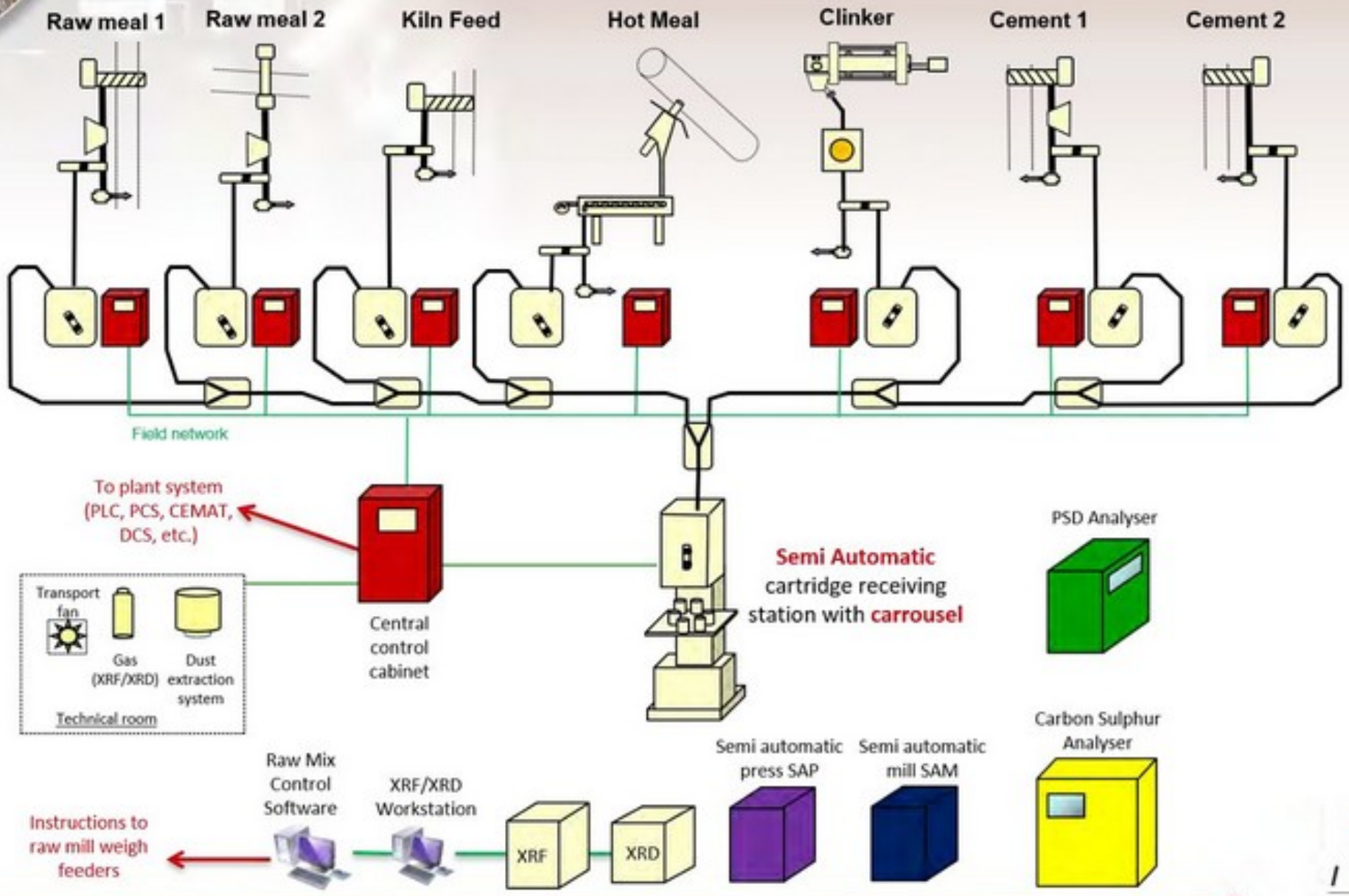
AUTOLAB – SEMI AUTO

= Sampling + Transport



AUTOLAB – SEMI AUTO

Cartridge Transport

Any powdery material

Cartridges discharged into cups on a carrousel

Diverter

Sampling System (ex.)

Cartridge

Sending Station

Pre erected set on frame (skid)

Semi-Auto Receiving Station with carrousel

Automation

ITECA

AUTOLAB – SEMI AUTO

Cartridge Transport

Automatic opening, discharge into cups on a carrousel and cartridge **cleaning**

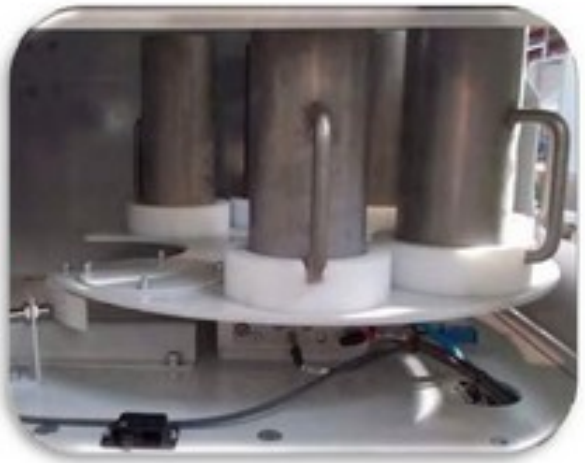
Up to **11 cups** on the carrousel

No cross contamination : each cup corresponds to a given sending station

No need to wait for the **operator**. He can collect several samples from different origins at the same time

Possibility to store **3 consecutive samples** from the same sending station in the **same cup** (mini composite sample)

Receiving station **fully compatible** for a later upgrade toward a **Full Autolab**



Cups (1L) on the **carrousel**

Touch panel for control

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AUTOLAB – SEMI AUTO

Sample Preparation

Semi Auto Mill & Pellet Press

Mill SAM

GRINDING CHAMBER SET UP

Samples **manual feeding** and **unloading**

Several volumes (10, 50, 100 & 250 cc) of **mill's bowl**

Tungsten carbide lining of mill's bowl and pressing tool available

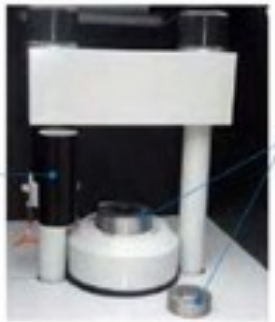
Free pressing (aluminium cup or boric acid coating) or **steel ring pressing**

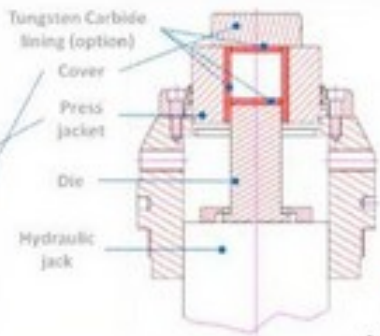
Secured closing & sound proof casings

User friendly HMI

Pellet Press SAP

FREE PRESSING SET UP





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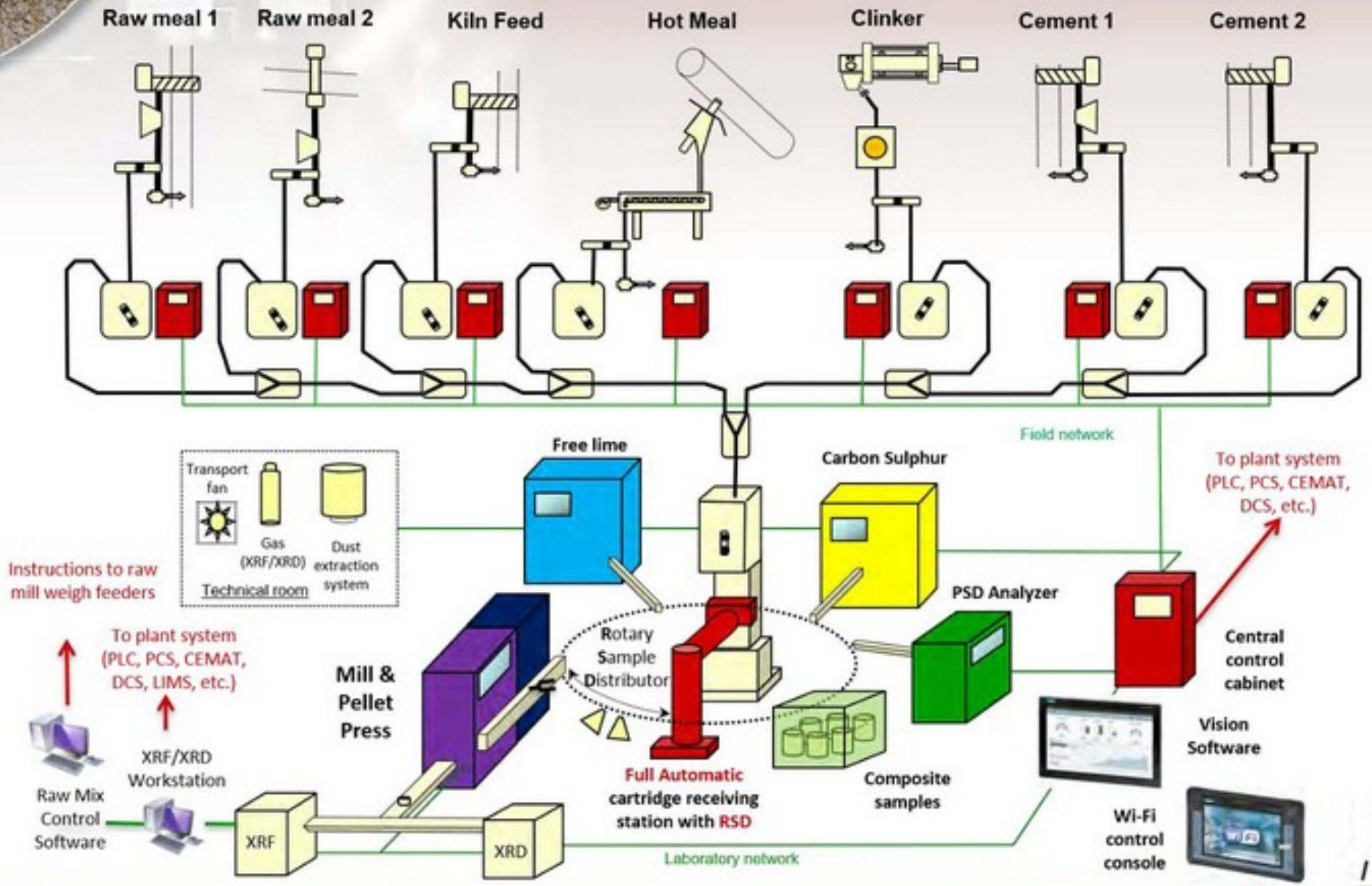
AUTOLAB – FULL AUTO

= Sampling + Transport + Centralised Analysis



AUTOLAB – FULL AUTO

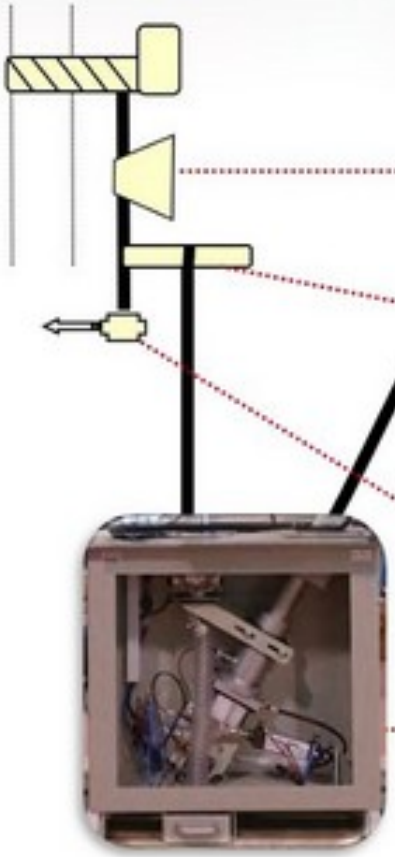
Cartridge Transport

Any powdery material

Cartridges discharged into the RSD

Diverter

Sampling System (ex.)



Sending Station

Pre erected set on frame (skid)

Full Auto Receiving Station with Rotary Sample Distributor

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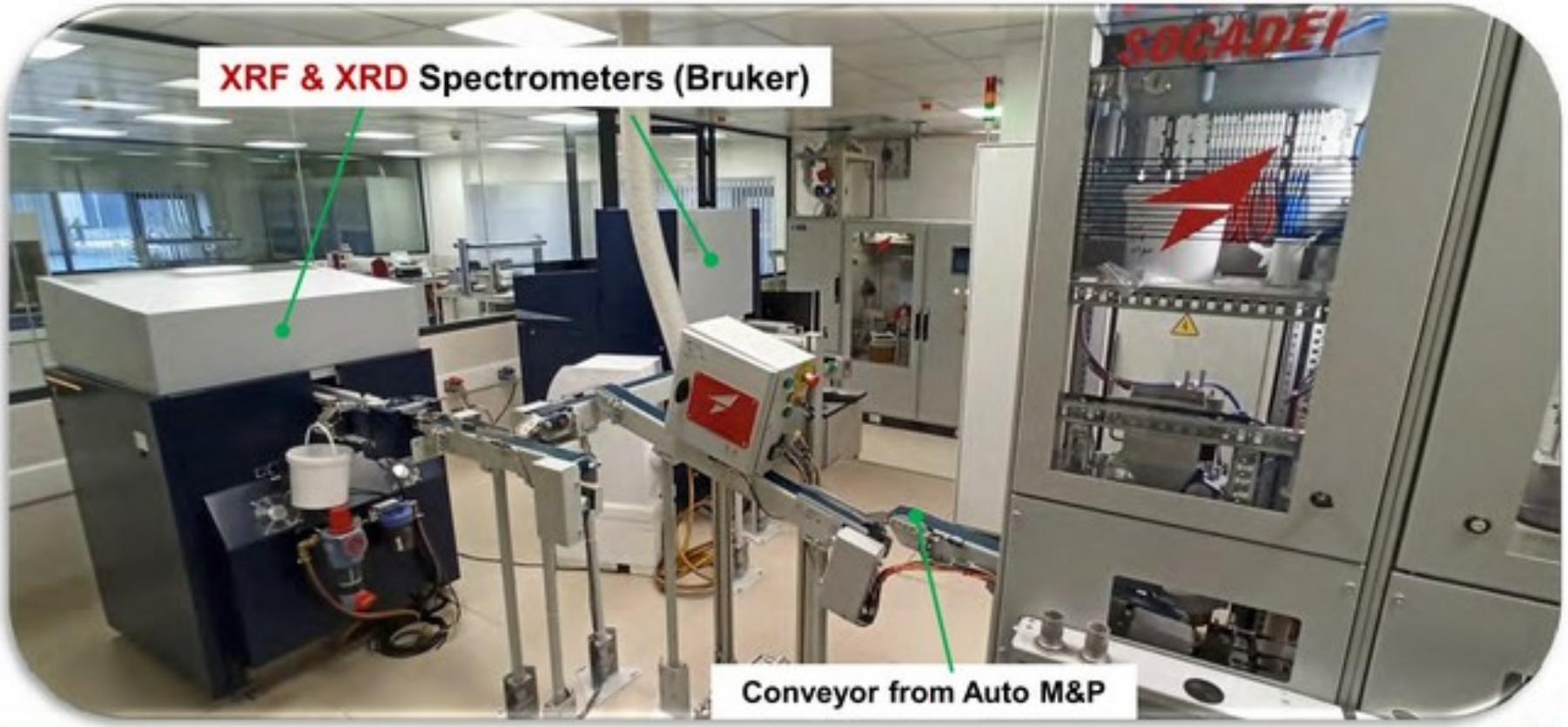
AUTOLAB – FULL AUTO

Automatic Analysis

- XRF/XRD on raw meal, hot meal, clinker and cement
- Carbon Sulphur on hot meal, clinker and cement
- Free lime on clinker and cement
- Loss On Ignition hot meal and cement
- Particle Size Distribution raw meal and cement



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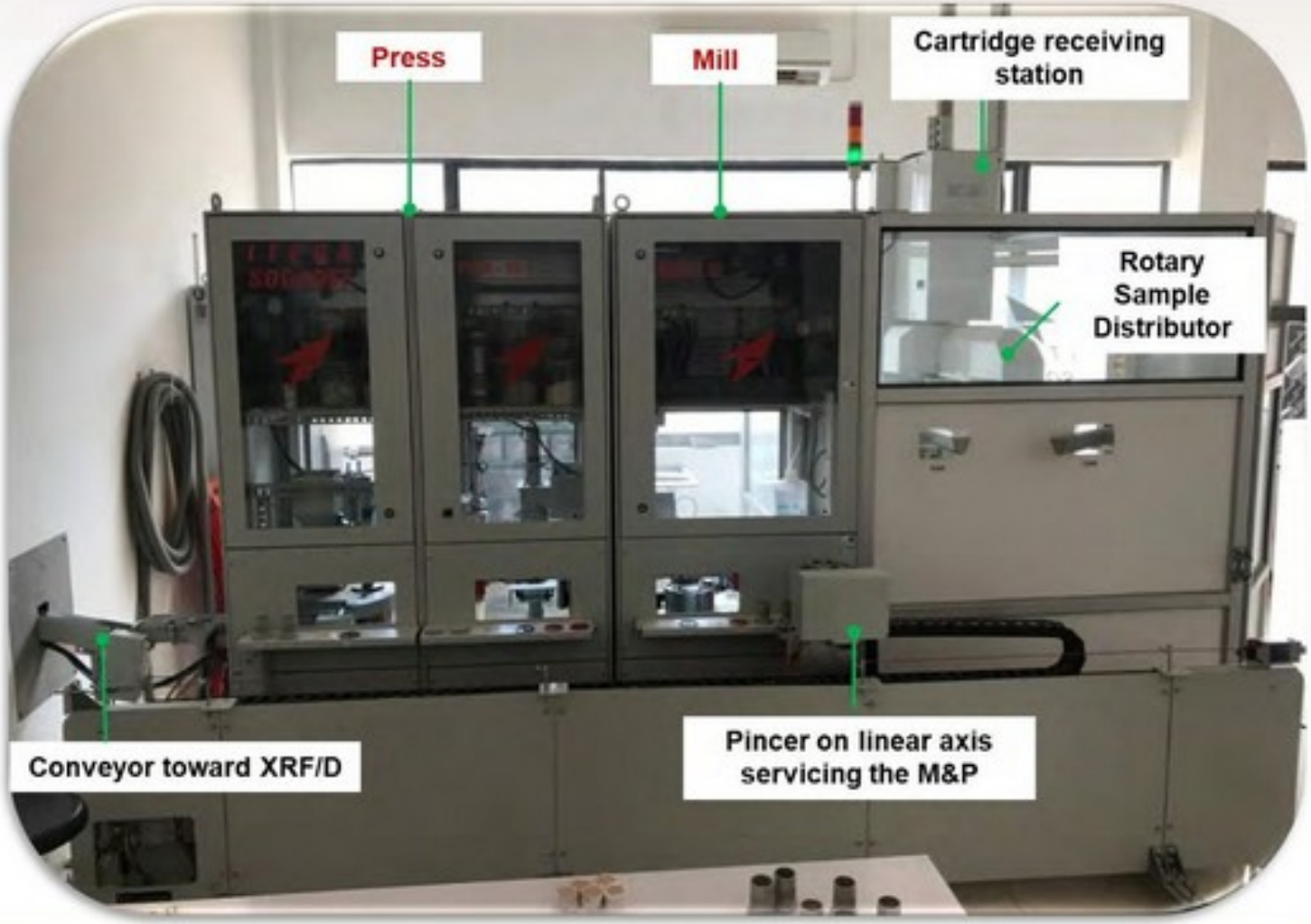
AUTOLAB – FULL AUTO

Sample Preparation

Auto Mill & Pellet Press



High quality pellet with boric acid coating

= Only pure sample in the pellet
= Ø sample contamination
= Ø pollution of XRF/XRD analysis

Unbreakable pellet
= Ø hazard for spectrometers

Easy access for maintenance

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AUTOLAB – FULL AUTO

Sample Preparation
Auto Mill & Pellet Press

Full visibility of the inside of the grinding bowl between each cycle

Linear axis with pneumatic pincer servicing the Auto M&P

Dedicated pellet either for XRF or XRD

High performance grinding for XRF:
Dv (50) < 3 µm
Dv (95) < 20 µm
→ Advanced XRF measurement

Coarser grinding for XRD :
Dv (50) < 25 µm
Dv (95) < 100 µm
+ Ø necessity to fine grind cement
→ Cement can be pressed without the need of being processed in the mill
→ More reliable XRD measurement

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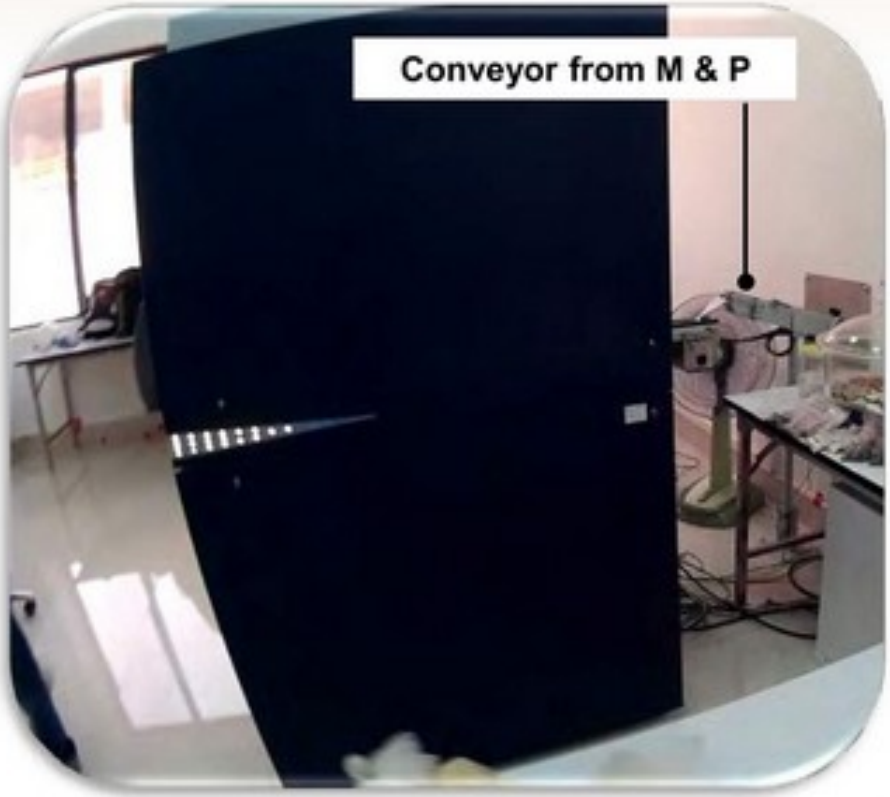
AUTOLAB – FULL AUTO

XRF/D Analysis

Adjustable to any kind of spectrometers

Combined XRF/D (Thermo)



XRF (Bruker)

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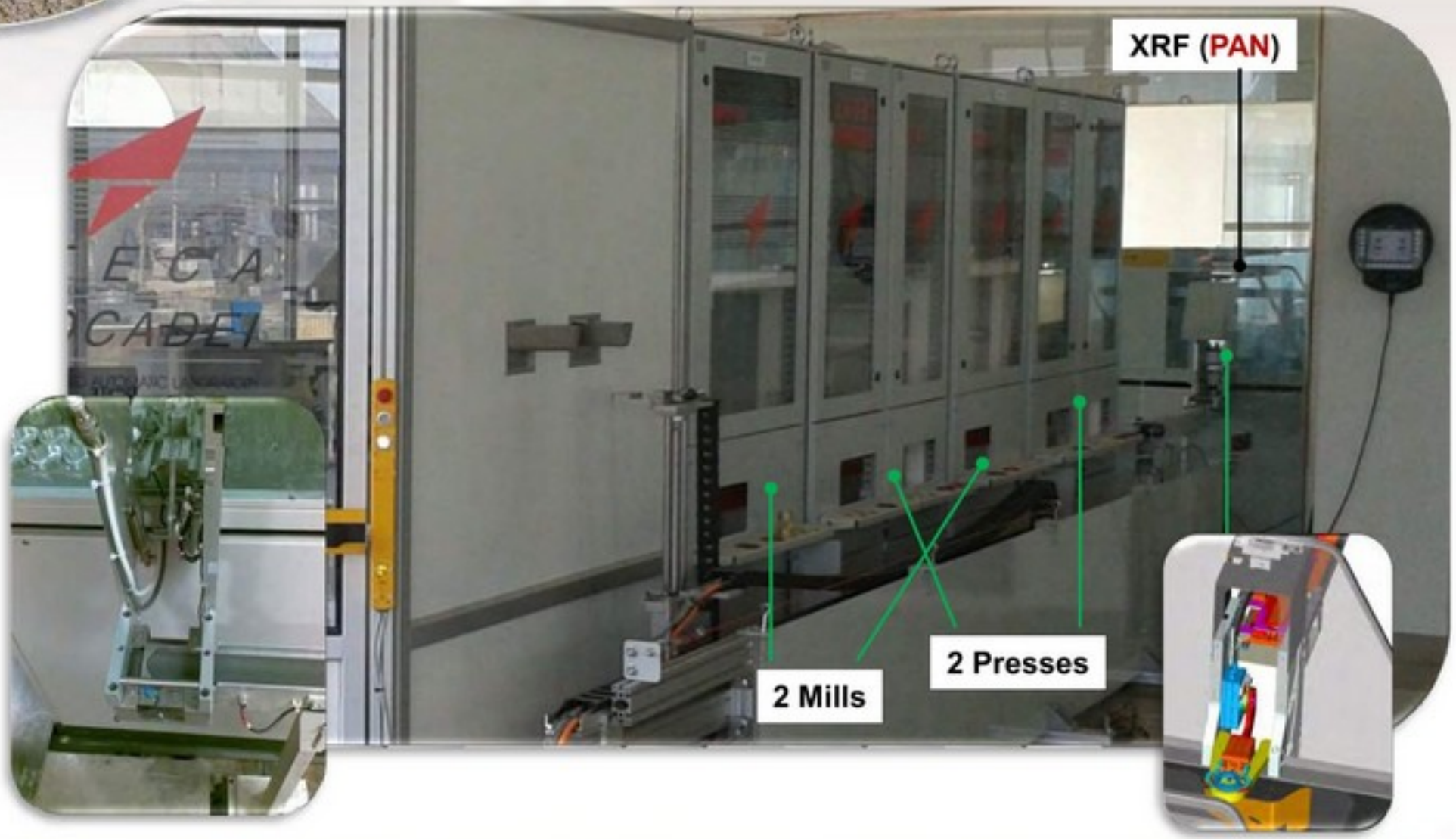
AUTOLAB – FULL AUTO

XRF/D Analysis



AUTOLAB – FULL AUTO

LOI Analysis

Analyser PF1

Analyser dedicated to hot meal and/or cement

1 analysis / 30 min

Analysis cell

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AUTOLAB – FULL AUTO

Free Lime Analysis

Analyser KLC2

Analyser dedicated to clinker

1 analysis / 15 min

Higher accuracy & frequency than XRD = better control over burning conditions

Heating
Mixing of clinker + glycol
Conductivity measurement

Analysis cell

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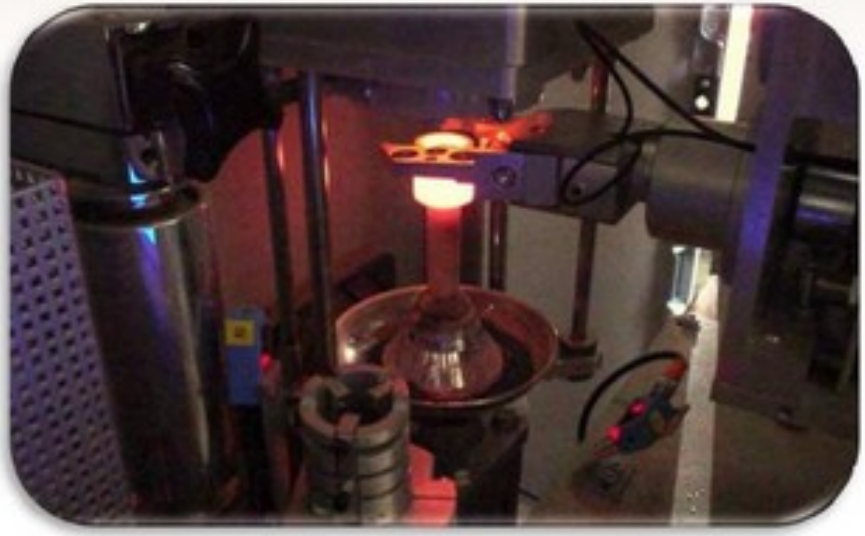
AUTOLAB – FULL AUTO

Carbon Sulphur Analysis

Analyser CO2-SO3

200 crucible storage system



Analyser dedicated to cement and/or hot meal and/or clinker

1 analysis / 10 min

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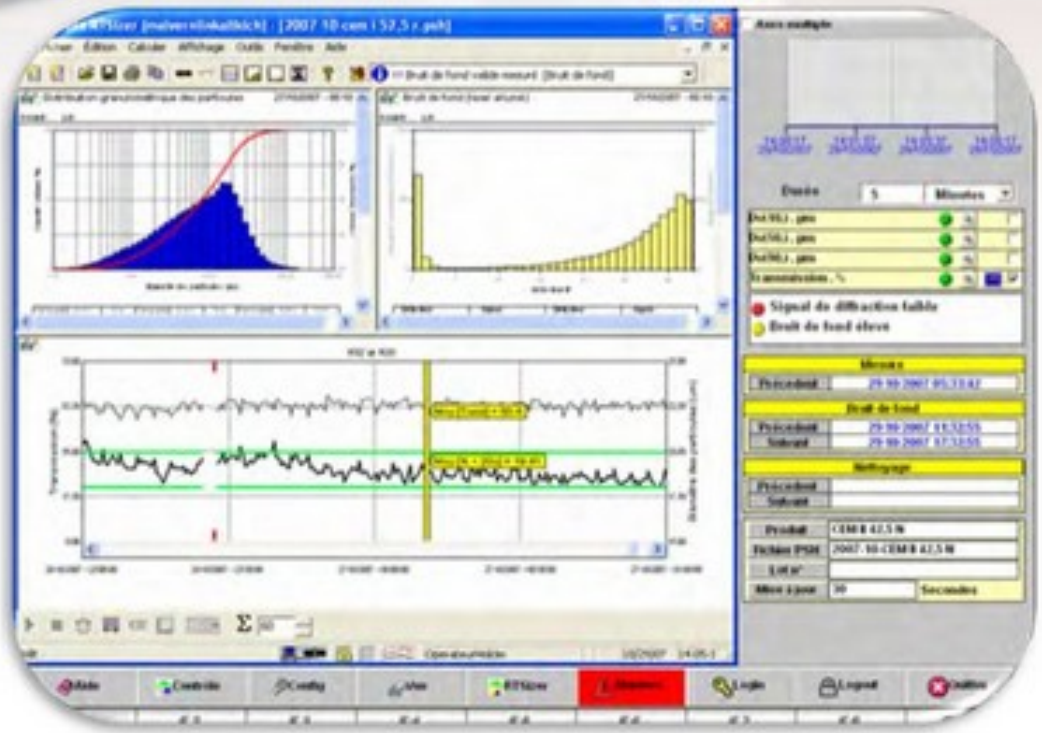
AUTOLAB – FULL AUTO

PSD Analysis



Analyser Labsizer

Analyser dedicated to cement and/or raw meal

Large sample analysis: 80 g

1 analysis / 10 min

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AUTOLAB – FULL AUTO

Automation

PLC Function Priority Management

Up to 40 functions
All configurations available
No sampling points number limits
Automatic initialisation
No Computer – 100% by **PLC**
All lab architecture available

Sequencers – Manual request – remote request available
Manual introduction

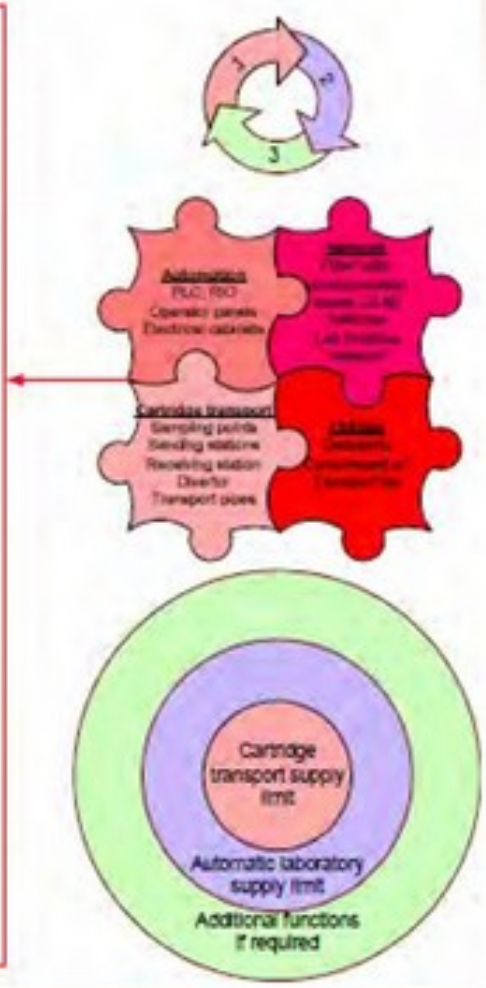
Sequence modification by HMI
Sequence setting by HMI

HMI for all states, faults, status

Automatic Production management reset

User Management Production function set up

Average, spot or immediate sample management



Wi-Fi control console

100% PLC operation

→ **Autolab under operation even if vision system is off**

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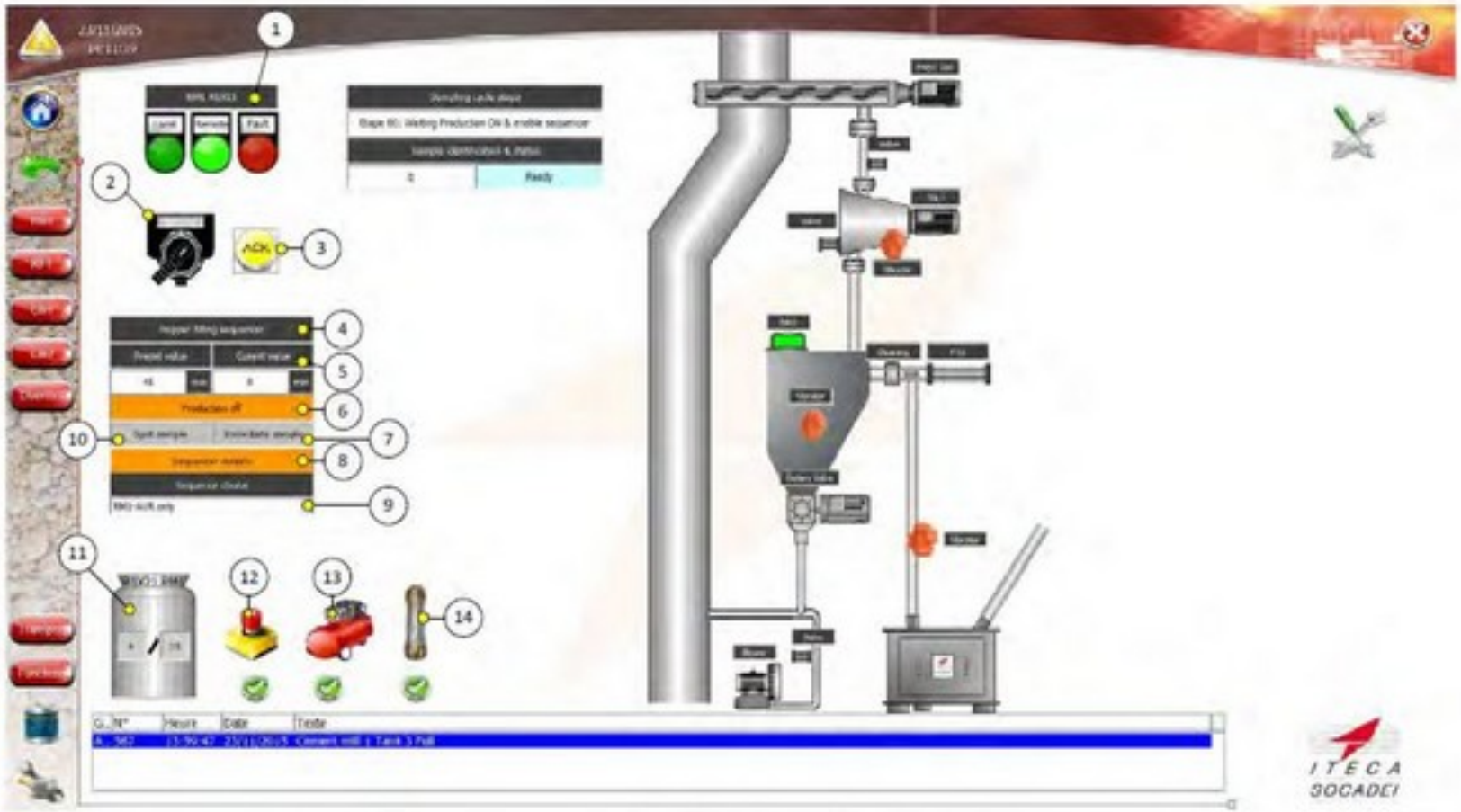
AUTOLAB – FULL AUTO

Supervision

Easy to use and to update

Custom designed screens

Done internally under TIA Portal



Sampling point – Raw meal with PRE

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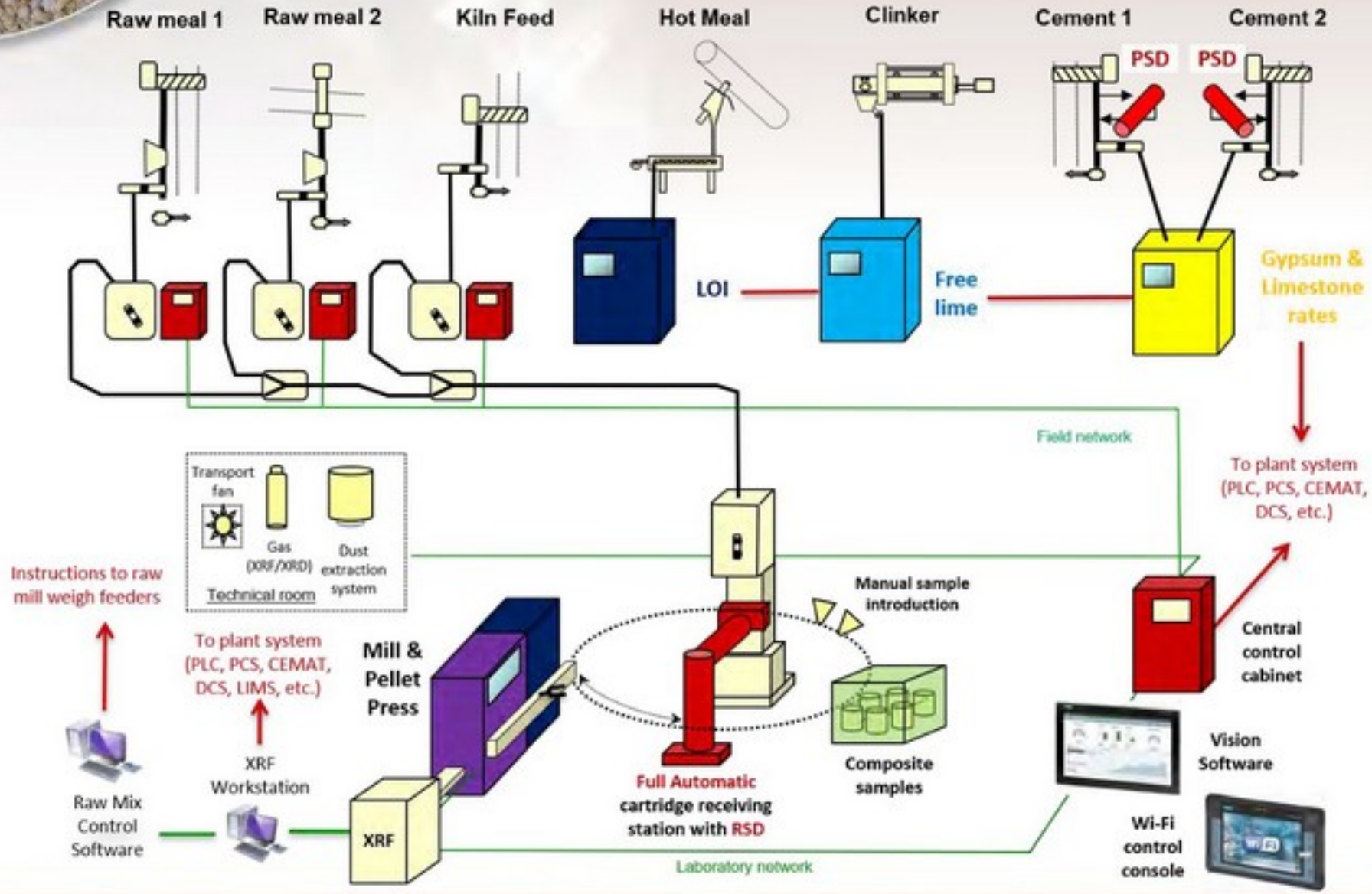
AUTOLAB – HYBRID

= Sampling + Transport + Centralised & On line Analysis



RM & KF analysed in Autolab (XRF)

LOI, Free Lime, cement additives & PSD analysed on line at high frequency

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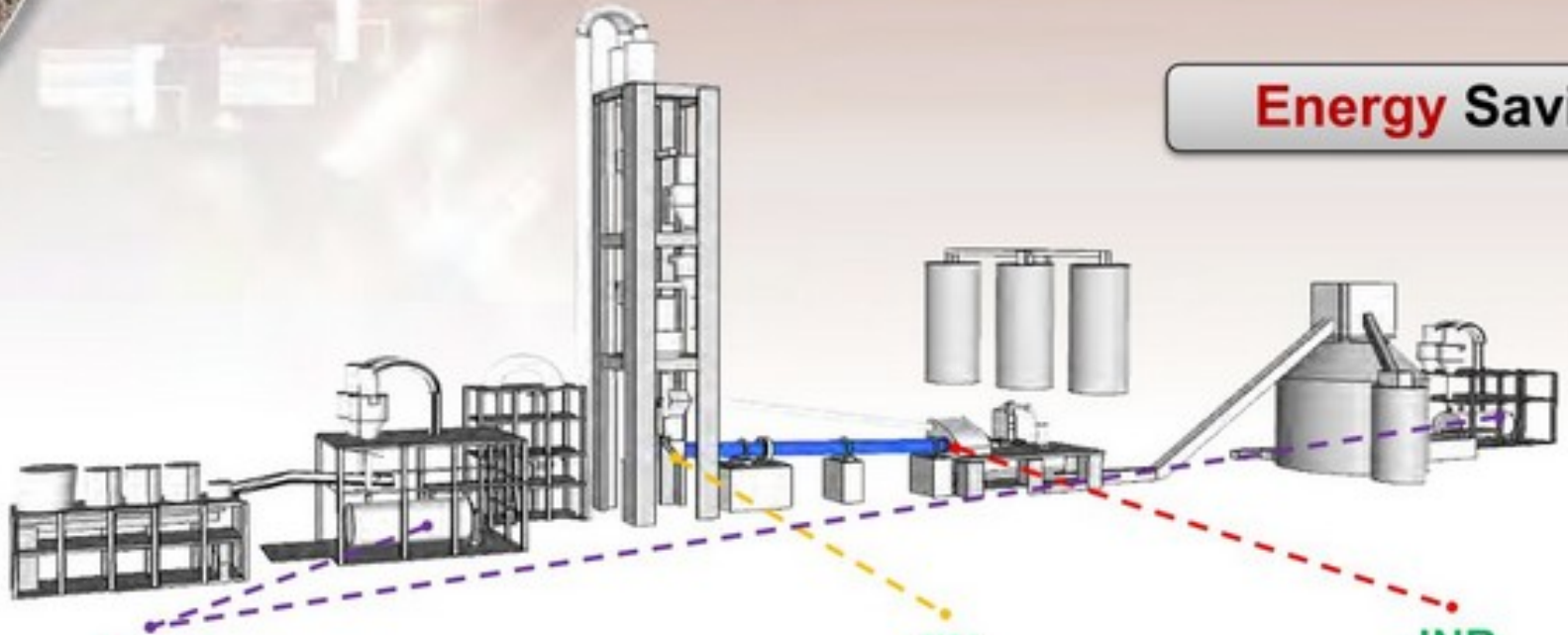
PRODUCTION EQUIPMENTS

Energy Savings !



TAB
Grinding Balls Sorting Machine

JIN
Kiln Inlet Seal

JNR
Kiln Outlet Seal

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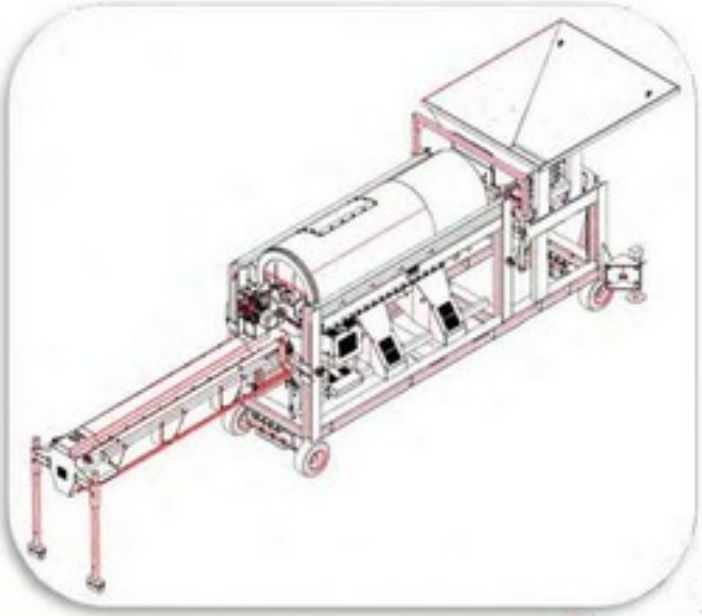
PRODUCTION EQUIPMENTS

Grinding Ball Sorting Machine

- 10 adjustable sorting classes
- Automatic removal of dust & broken balls
- High throughput (up to 1,5 T/h/class)
- Compliant with safety standards (protection panels, emergency stops)
- Compact size for easy storage and handling
- Easy commissioning



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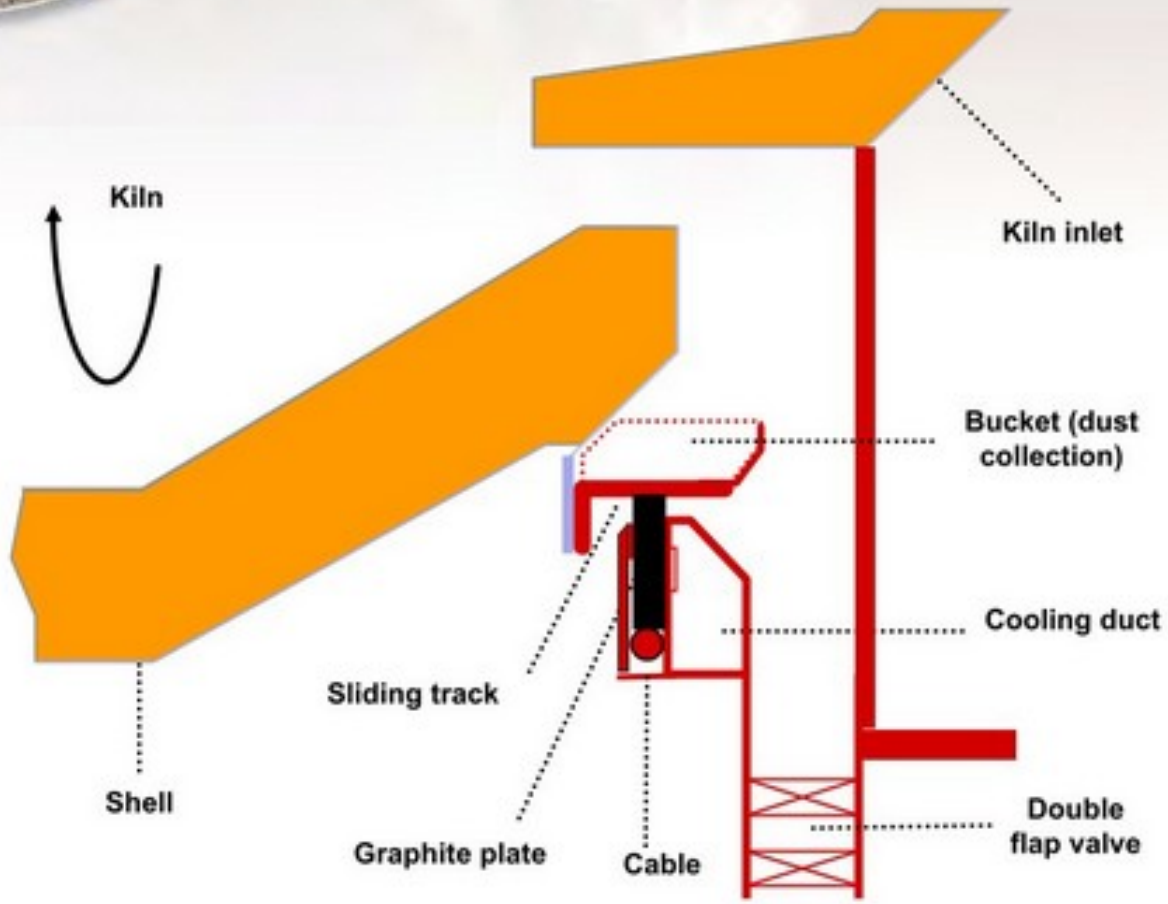
PRODUCTION EQUIPMENTS

Inlet Seal



The graphite plates are held in contact with the sliding track by 2 cables and 2 counterweights

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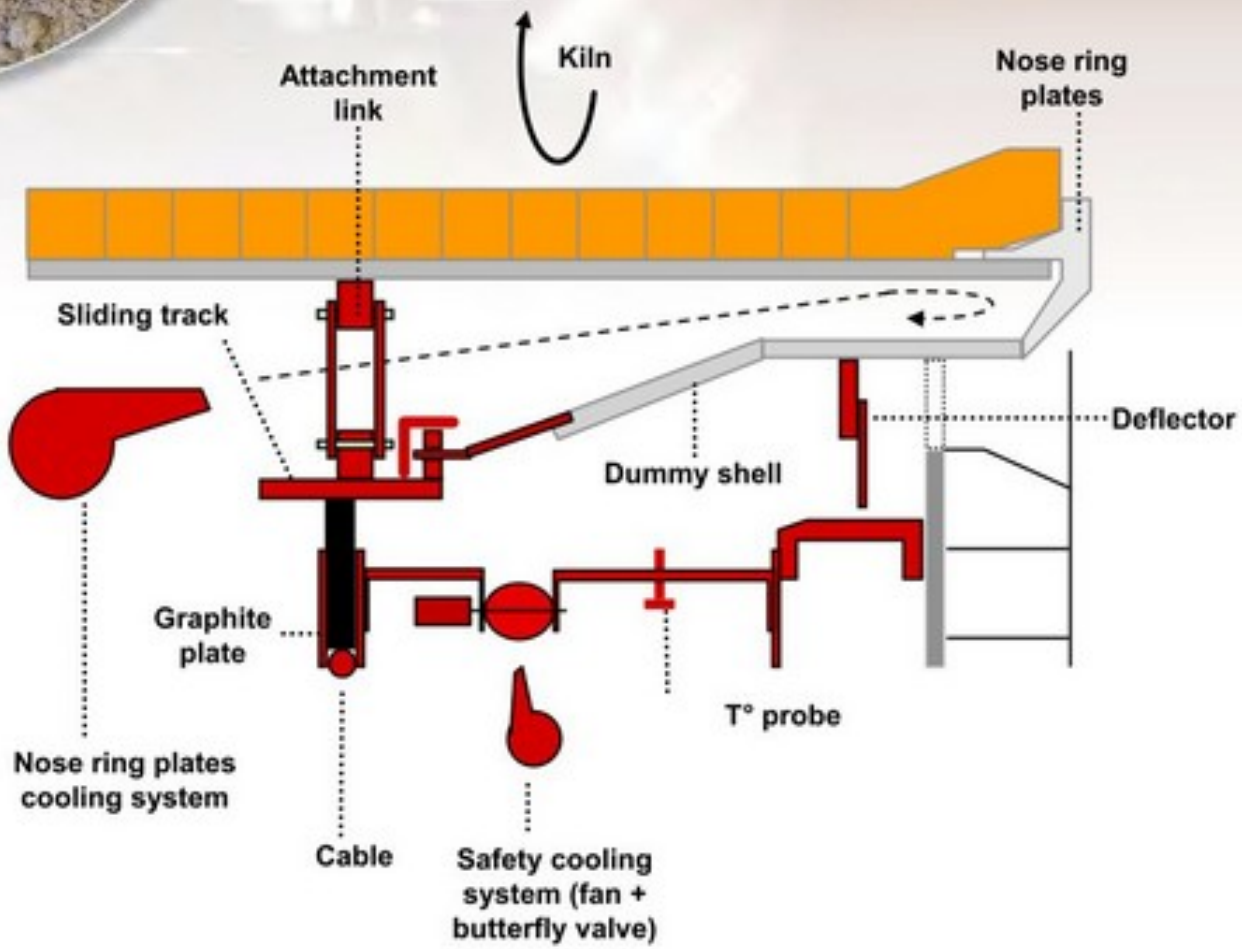
PRODUCTION EQUIPMENTS

Outlet Seal



Graphite plates seals

Reduced maintenance

Continuous efficiency

Long-lasting equipment

Many **references**

ITECA
SOCADEI
CEMENT DPT

More info?

www.iteca.fr

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