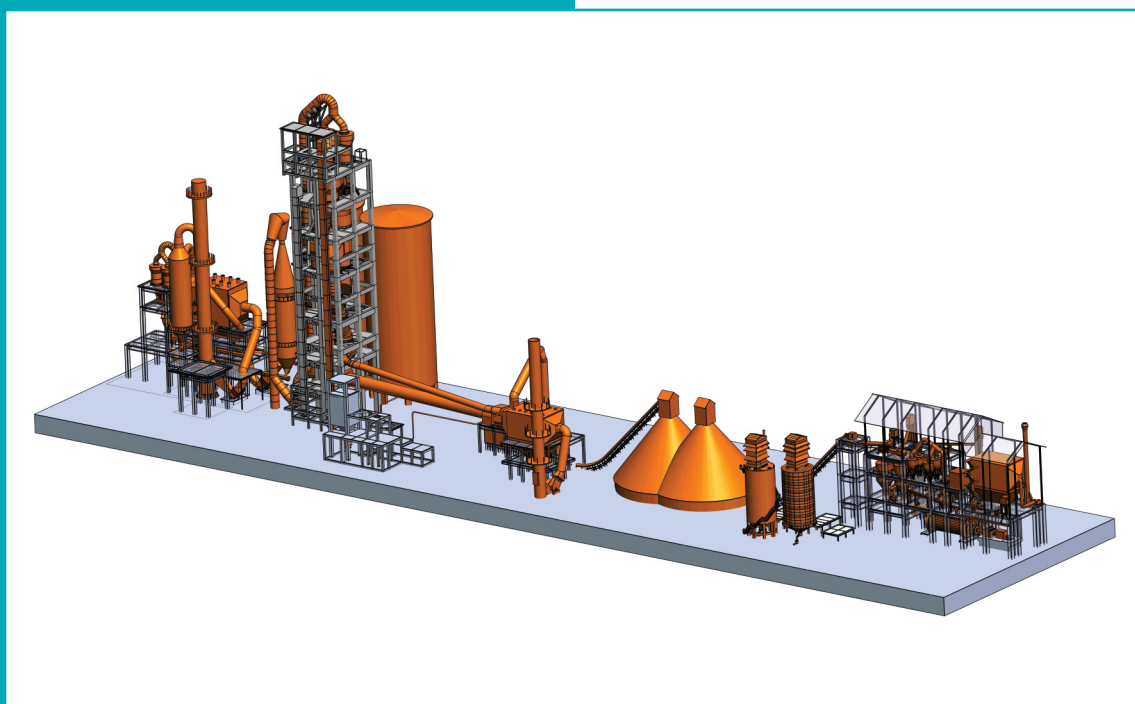
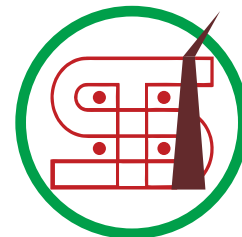


# SAIPHIA GROUP







## PRO PROCESSING UNIT

PREHEATER

CLINKER COOLER

ROTARY KILN

CALCINER

COAL FIRING ARRANGEMENT & TRANSPORTATION

FLUIDO AFR CALCINER

CYCLONES

IMMERSION TUBE

EXHAUST DUCT

FLAP

MEAL PIPE

EXPANSION JOINT

DISPERSION BOX

WATER SPRAY ARRANGEMENT

ALKALI BYPASS SYSTEM

CHLORIDE BYPASS SYSTEM

# PYRO PROCESSING UNIT

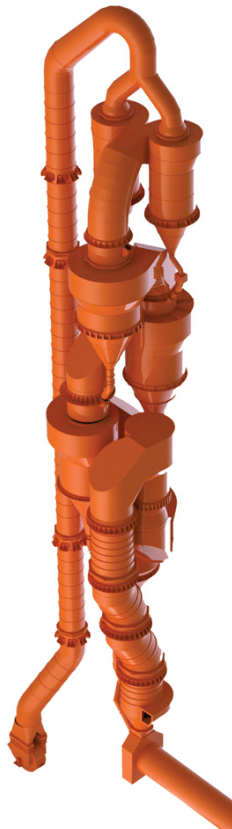
## OVERVIEW

We have 13+ years of experience in Engineering, Designing, Modifying, Manufacturing, Erection & Commissioning pyro section equipment. We offer wide range of equipment in Pyro section. Our equipment ranges from Calciner, Cyclone and Immersion tube, Exhaust Duct, Dispersion Box, Expansion Joint, Coal Firing Arrangement, and Cooler etc.

We design our pyro processing equipment to offer the highest efficiency for lowest manufacturing & operating cost. Considering technology we have & experience in field, we are able to offer the right solution for any project-specific requirement. We design the best pyro processing solution for any application between 600 and 10000 tpd to match production capacity, fuel concept, regional prerequisites or emission limitations.

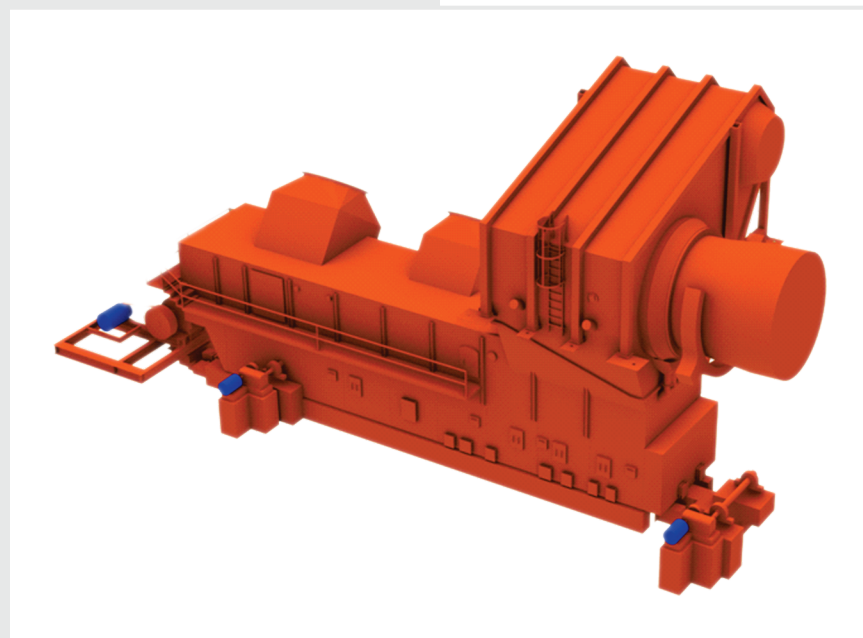
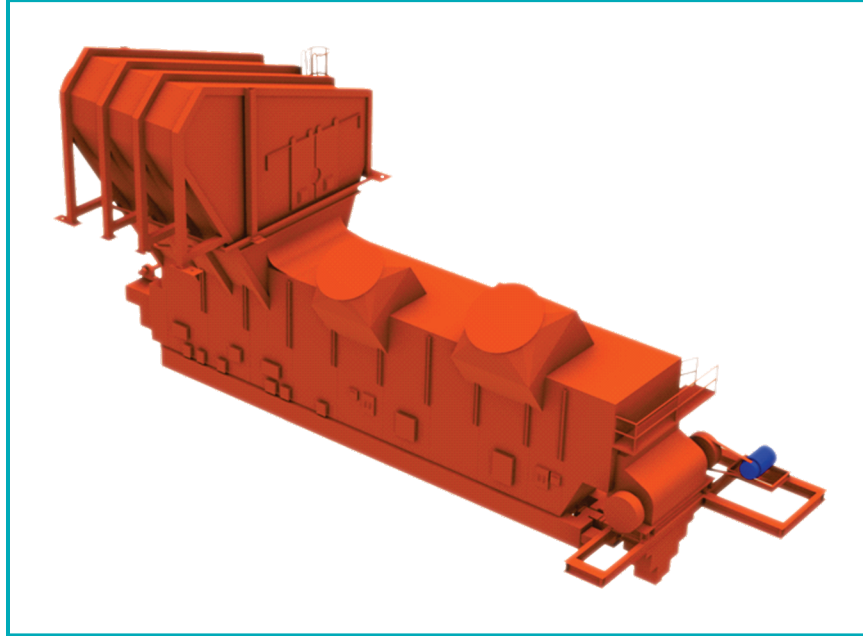
This fact underlines our position as technology leader and expert in the field of cement production Technology. With regards to essential pyro processing equipment, amongst others, the preheater and the Calciner we are fastest growing company in world right now. Providing tough competition on international level.

## PREHEATER



## CLINKER COOLER

Our unique combination of technology optimise your Cooler performance and overall production. We do the simple modification in existing cooler to increase recuperation efficiency and cooler loading.

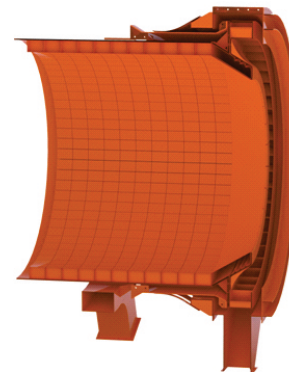
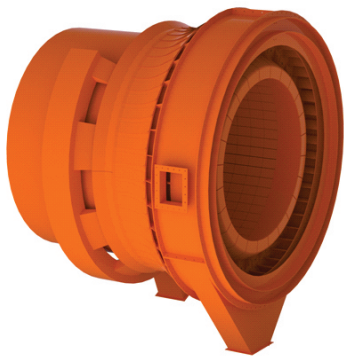


## ROTARY KILN

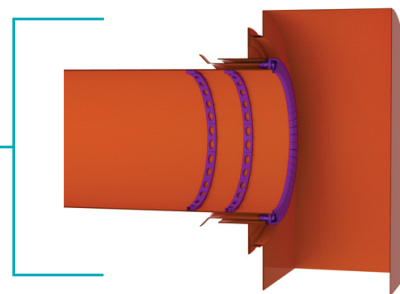
Our unique combination of technology optimise your Rotary Kiln performance.



INLET KILN SEAL

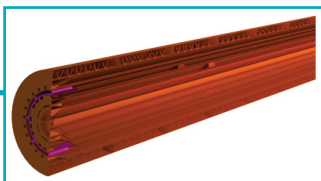
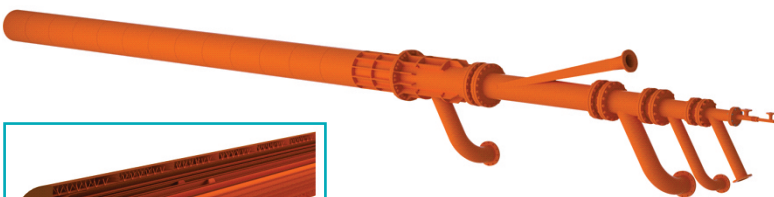


OUTLET KILN SEAL



## KILN BURNER

Our burner are developed with unique design to optimize fuel fring.



## CALCINER

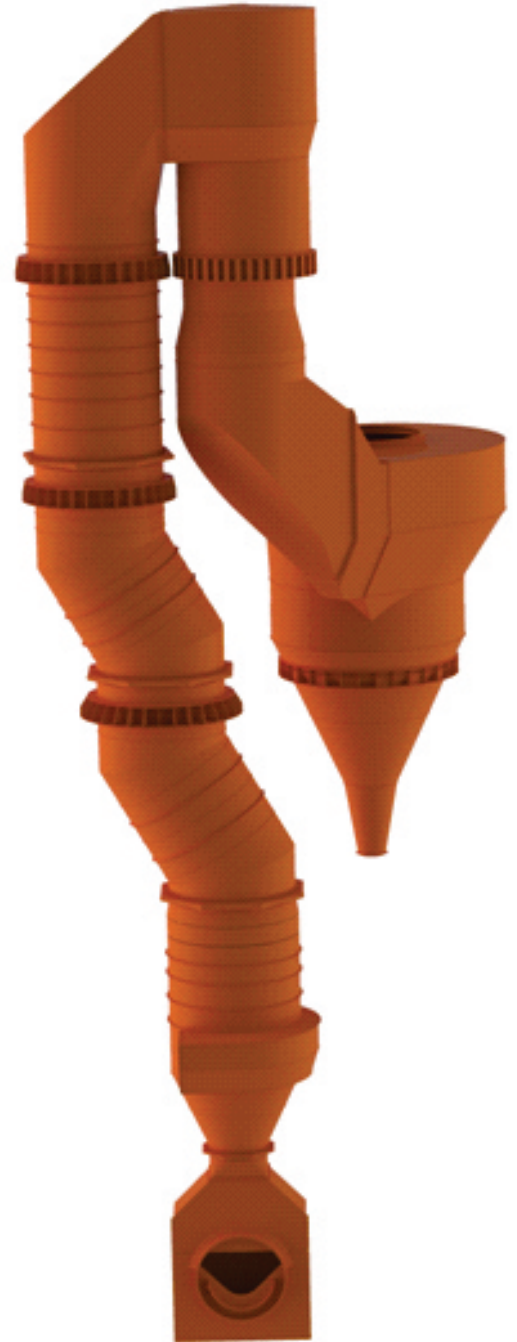
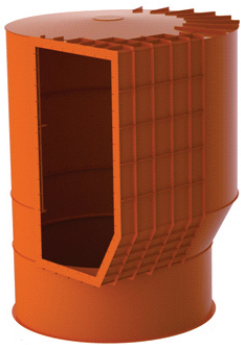
Meticulous designing of Calciner is of utmost importance for pyro section. Our team of expert designer & process engineers have exclusive skills & years of experience in designing Calciner vessel. 95 % of calcination takes place in Calciner & 60-70 % of the fuel used at modern cement plants is required in the Calciner. We continuously innovate in this centre of fuel consumption with efficient and project-specific solutions. We offer Calciner with feature that have best flow and reaction conditions for continuously stable operation at lowest possible fuel consumption, low cost and highest possible alternative fuel utilization .

### CALCIMIX CALCINER

The type of Calciner is simplest with lowest pressure drop, making it a highly attractive low investment option. Our calcination system is multi-stage, vertical equipment designed for maximum heat transfer to minimizing exhaust energy loss in first place and minimum power consumption.

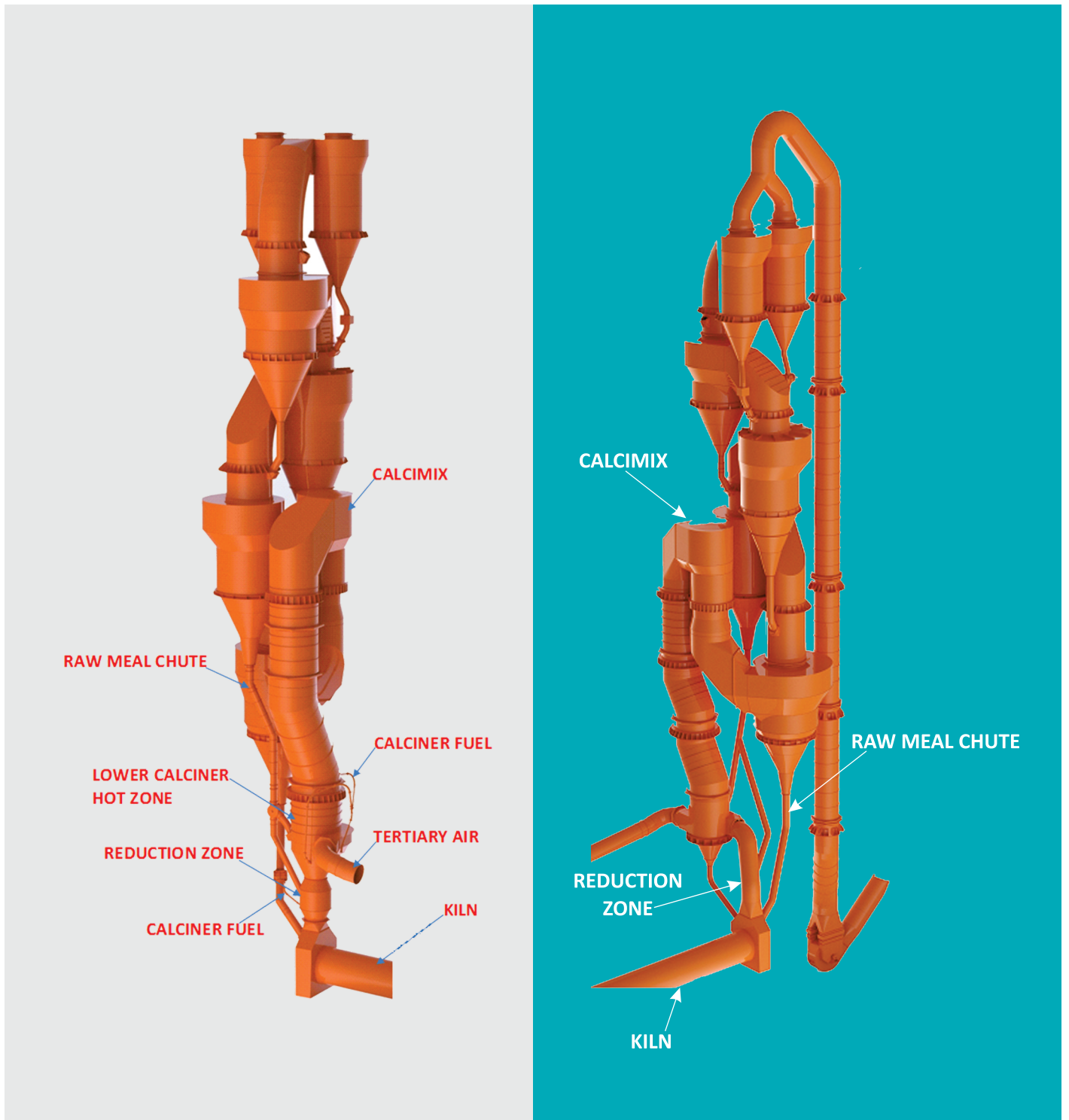
Our priority is to minimize power & fuel consumption with ease of operation, negligible maintenance, low emissions and durability.

Our special design calcimix gives an additional gas and material retention time for better heat exchange.



## LOW NO<sub>x</sub> CALCINER TECHNOLOGY

We are committed to cut your NO<sub>x</sub> emissions, Our special design low NO<sub>x</sub> technology have almost reduced fuel NO<sub>x</sub> by 50% or more depending on fuel and raw mix design. The low NO<sub>x</sub> technology of Saiphia is economical, effective and tailor made.





## ADVANCE, COST EFFECTIVE & EFFICIENT WAY FOR NOX REDUCTION

We understand the need to reduce the NO<sub>x</sub> emission of preheater as per standards. Take a shy of relief by achieving your NO<sub>x</sub> emissions limits. For your problem we have solution. Low NO<sub>x</sub> Calciner is our most advanced in-line Calciner. Meeting NO<sub>x</sub> emissions is most important for cement producers around the world, not only because NO<sub>x</sub> related, but also because your license to operate is directly linked to your NO<sub>x</sub> emission. Our years of experience in cement plant designing, process engineering & field expertise as helped us to design & develop low cost, highly efficient & sustainable Calciner to meet emission standard of all around the world.

### WORKING PRINCIPLE



#### 1. NO<sub>x</sub> is formed inside the Calciner due to 2 main reasons:

- a) High temperature in combustion zone.
  - b) Oxidation of Nitrogen molecules
- 1) Oxidation of molecular nitrogen present in Combustion air (Thermal NO<sub>x</sub>).
  - 2) Oxidation of nitrogen compounds in fuel (Fuel NO<sub>x</sub>).

- Since reactions requires high temperature to occur, only oxidation of nitrogen molecules can be avoided.
- Fuel is injected in reduction zone where oxygen contain is low.
- Fuel Combustion takes place at high temperature but halts oxidation of Nitrogen molecule
- Reduction zone is designed for required retention time & temperature.
- Material inlet from splits for lower stage cyclones help maintain the temperature
- Design of low NO<sub>x</sub> is challenging task to deliver, keeping NO<sub>x</sub> emission limit in mind. Our team of expert Process & Design team.
- Having years of experience in Cement Industry made it look simple.
- Our Design team consist of CAD & CFD modelers, which helped us to analyze the real time scenario occurring inside pre-calciner.

Extensive Computational Fluid Dynamics (CFD) & study resulted in incorporation of reduction zone

## DESIGN

### SALIENT FEATURES:

- Multiple fuel inlets
- Split Meal pipe
- Improved Lower Calciner working
- Simple Construction
- Lower material requirement

### MULTIPLE FUEL INLETS:

- For efficient distribution of gases & fuel multiple fuel inlets are assembled
- For flexible usage of fuels, multiple inlets facilitates efficient burning

### REDUCTION ZONE:

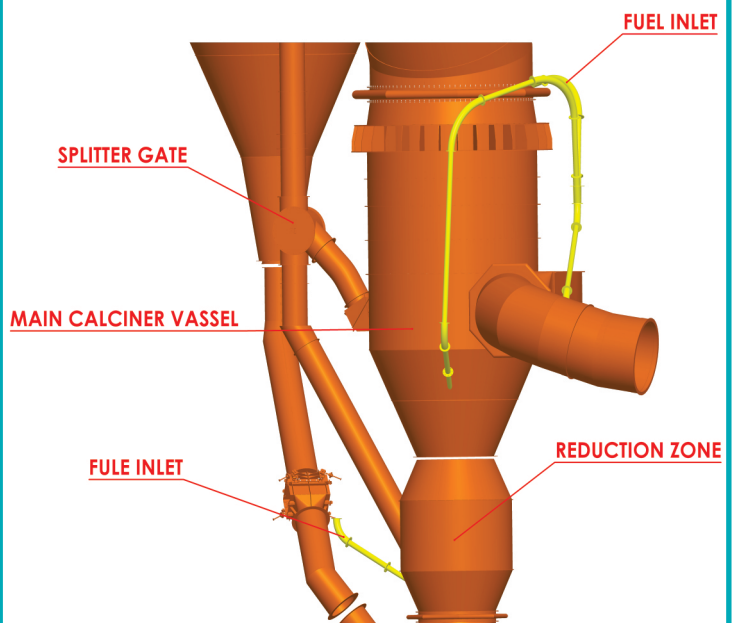
- Design of reduction zone & inlet of material is located after extensive study & expert inputs
- Design of reduction zone help maintain temperature of combustion zone

### MATERIAL SPLIT UP:

- To improve combustion & lower NOx emission.
- To maintain temperature of combustion zone

### MAJOR BENEFITS:

- Efficient NOx Reduction Zone
- No need to administer reagent like ammonia
- Flexibility in fuel usage
- Low Cost
- Low Maintenance
- Upgradation of existing calciner without much changes to help customer emission targets



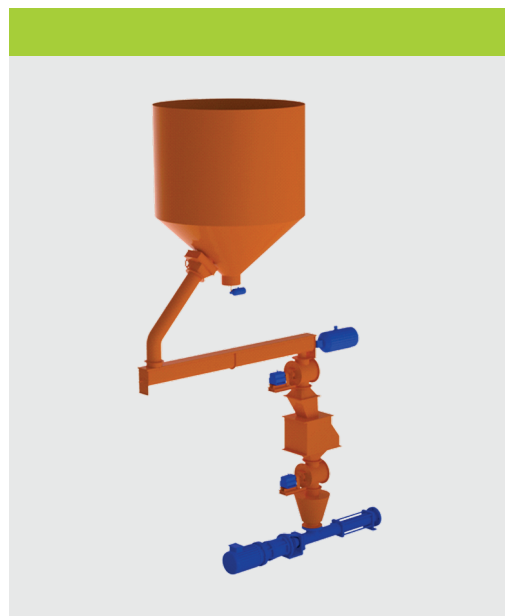
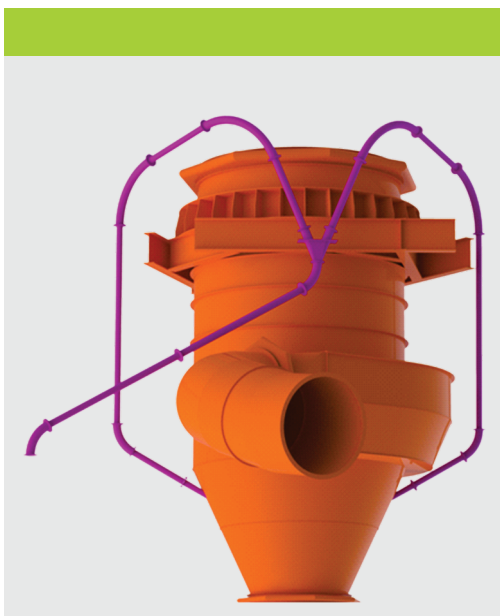
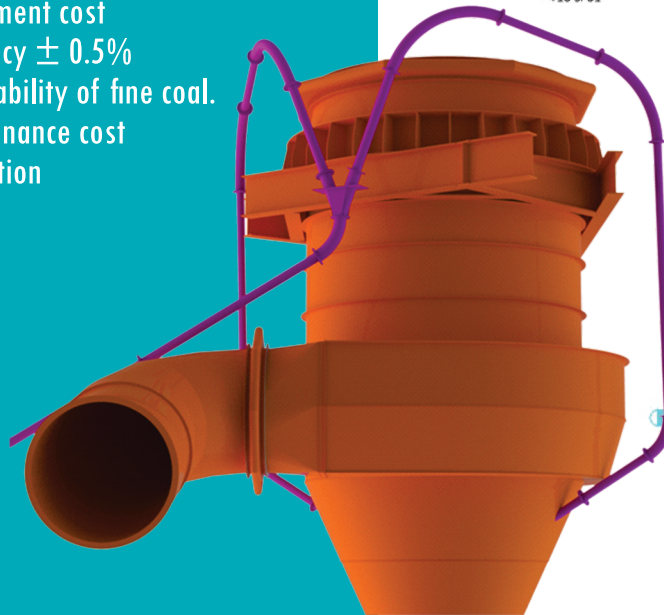
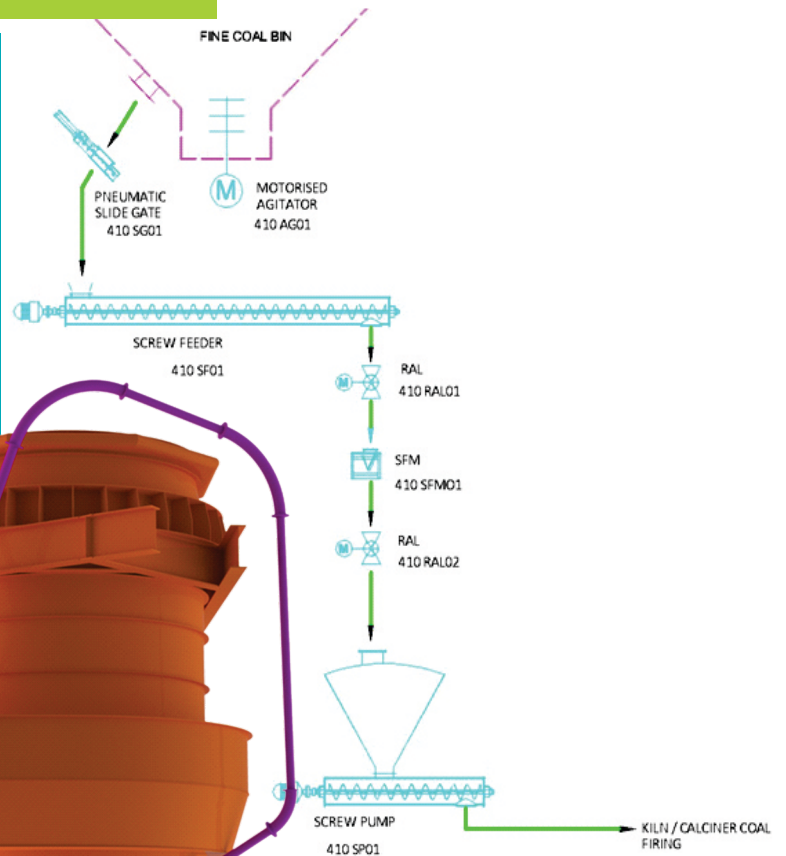


## COAL FIRING ARRANGEMENT & TRANSPORTATION

Unique design of nozzle & proper diameter of coal transportation pipes makes complete combustion of coal and system attains required temperature. Unique design also ensures better mixing of fuels, hot gases & hot meal.

Our coal firing system have following key points:-

1. Low investment cost
2. High accuracy  $\pm 0.5\%$
3. Better flowability of fine coal.
4. Low maintenance cost
5. Easy operation



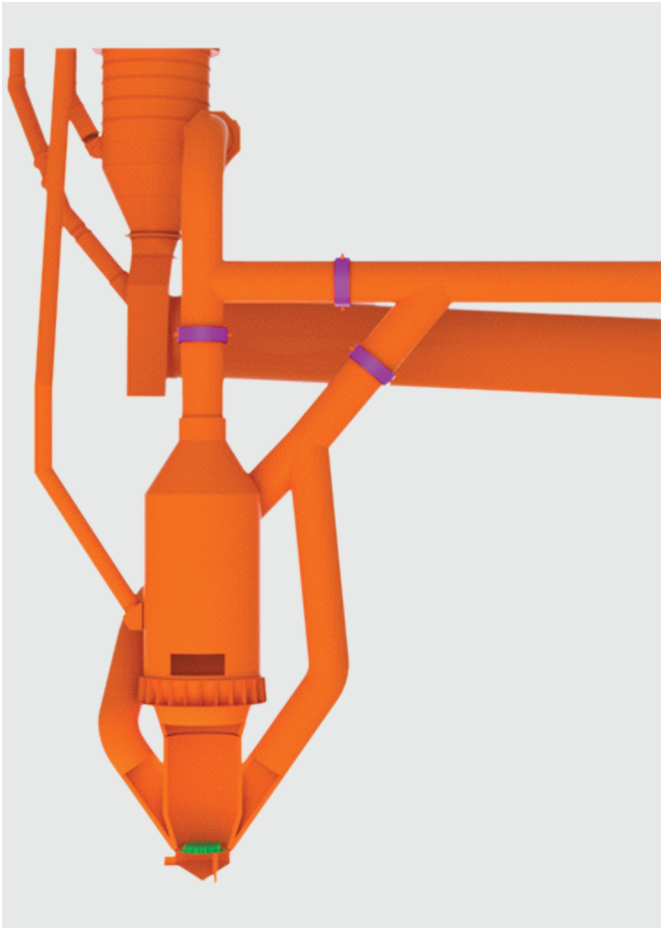
## LATEST AND ADVANCE FEATURES, WE OFFER

1. No Restriction of Shape, Size and type of Fuel through air sealed gate
2. No Reduction or Shredding of AFR is Required
3. No preparation of AFR is required
4. No Restriction on AF filling
5. Ground floor material feed — low civil structure cost
6. Gate valve for reject
7. C4 Meal chute for temperature control
8. Provision for Burner
9. TAD damper operation for Oxidizing and NO<sub>x</sub> Control
10. High efficiency and flexibility
11. Low maintenance
12. Low Investment on Feeding System
13. Low investment cost as Fludo Calciner is installed on ground
14. System can be made online and offline as per our wish without disturbing the operation



# FLUIDO AFR CALCINER

BRINGING YOU INDEGENIOUS EXPERTISE



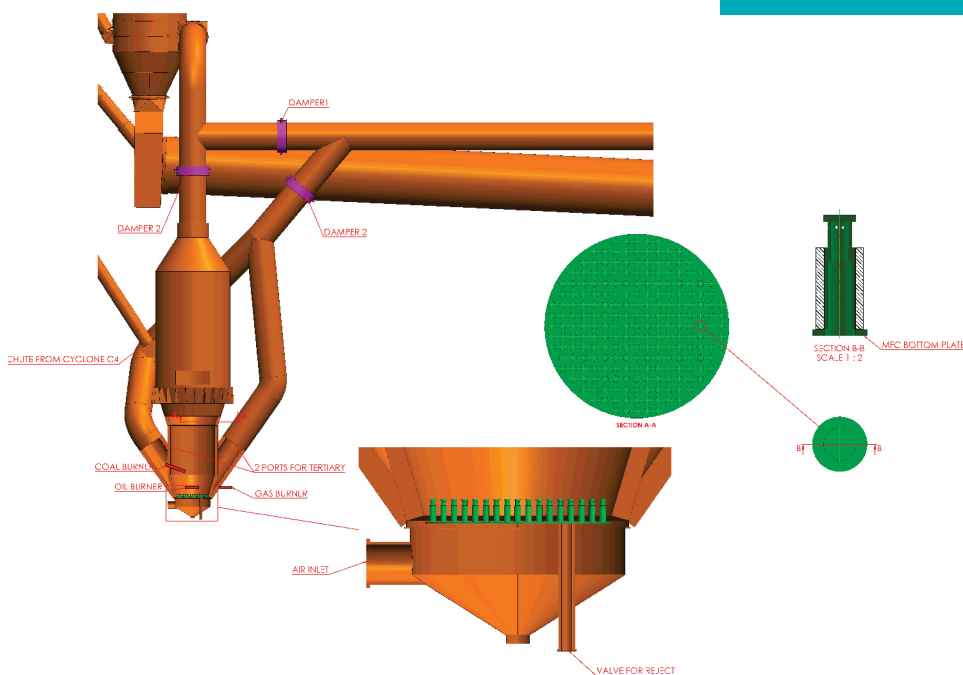
India has more than 210 Large Plants and 350 small Units of Cement Industry and is reaching 500 MTPA mark Due to competitiveness and subsequently innovative reforms. Cement Dispatch remains as consistent always except few slow-downs which gives thrust to cost.

Indian Cement Industry is operating at Lowest Specific Heat consumption of Average 700 Kcal/ kgcl, Where Specific Heat consumption Japan, China, USA and Canada is 836,1018,1099and 1040Kcal/ Kgcl. Respectively .While the world Average is 850 Kcal/ Kgcl. Average AFR Usage in Indian Cement Industry is below 3.550 % TSR which is Far Lower than Developed countries

Saiphia Group continuously worked upon few important equipment invented/ developed to enhancement Way's to use of Alternate fuels and Alternate Raw materials to Increase the overall Efficiency of Industry/plant.

We offer

- Low investment cost
- High efficiency and flexibility
- Low maintenance
- Latest and Advance technology



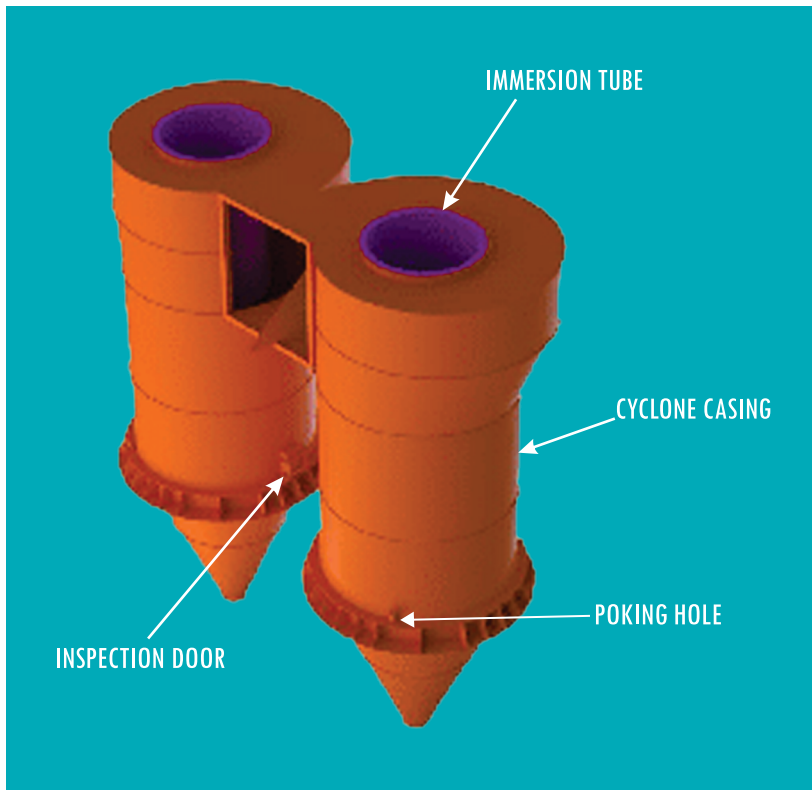
Waste Generation in India is continuously increasing day by day. But Only 25 % of Generated Waste is treated. The natural Resources collapsing day by day. With the help of AFR usage natural resources can be Saved.

## CYCLONE

FOR BETTER SEPARATION

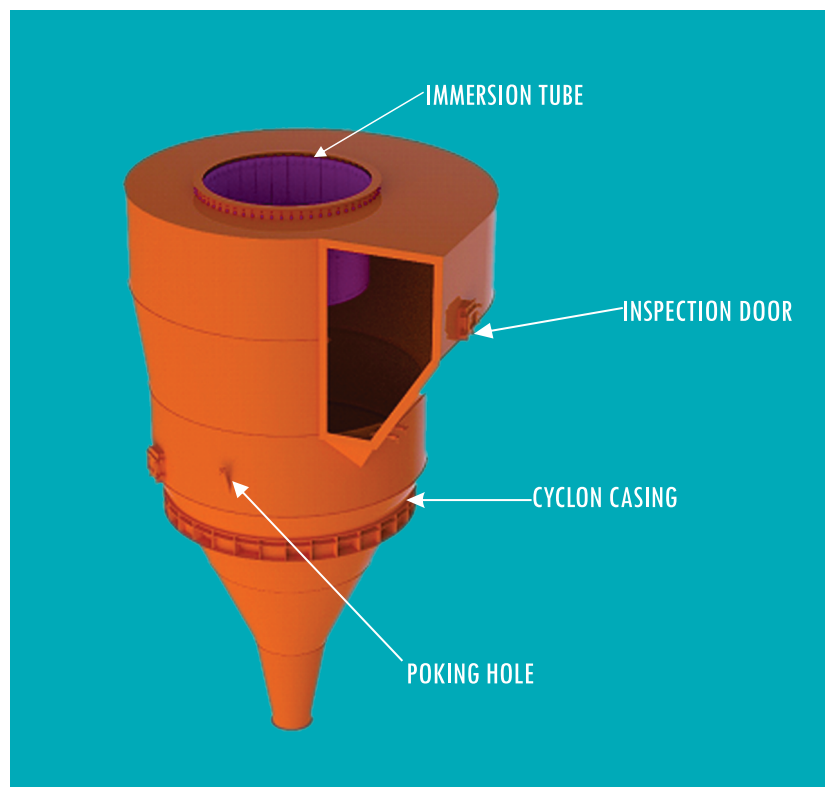
### KEY FEATURES

- Low pressure drop.
- High dust separation efficiency.
- Low waste gas temperature.
- Low electrical power demand.
- Suitable for waste fuels.
- Effective emission control technology.



- Preheaters with modern designed cyclones produce low pressure drops and are high in separation efficiency.
- The resulting low waste gas temperatures lead to reduced heat losses, waste gas quantities, CO<sub>2</sub> emissions, dust emissions and electrical energy consumption.

The cyclone system is the key to an efficient modern kiln. Each cyclone system is unique, its design, construction and operating characteristics decided by such factors as.



## TWIN CYCLONE

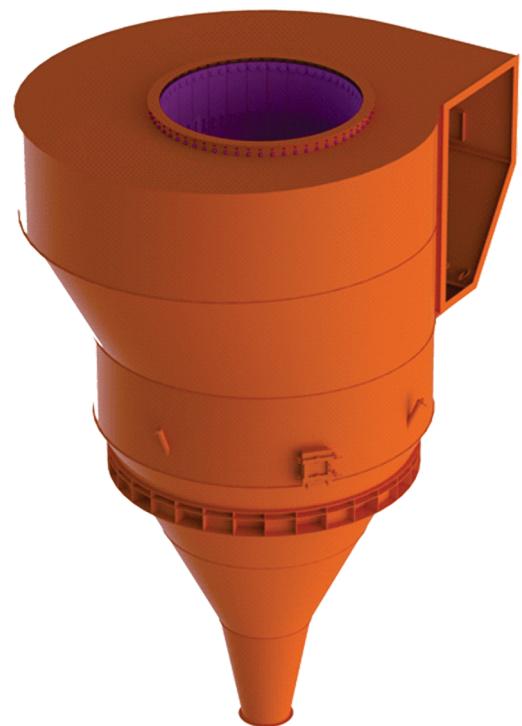


- Robust & Economical cast design for longest lifetime
- Easy Installation
- Less maintenance
- Twin Cyclone having Efficiency  $\geq 96\%$
- Low pressure drop

## SINGLE CYCLONE

### EXAMPLES:

- Single stage double separator for “long dry process”, installed upstream from an upgraded long kiln.
- 3 stage preheater for extreme raw meal moisture levels, for example “semi wet process” with integrated flash dryer.
- 4 to 6 stage single string preheater for small to medium capacities (1,500-5,000t/d).
- 4 to 6 stage two string preheater for medium to high capacities (4,200-10,000t/d).
- Special solutions for largest capacities, for example 6 stage 4 string preheater for 10,000t/d at high altitude.





## CYCLONES

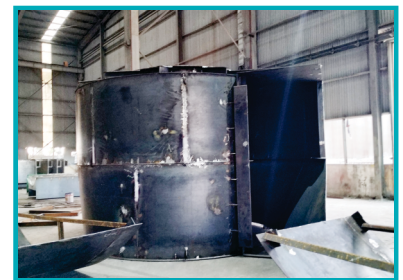
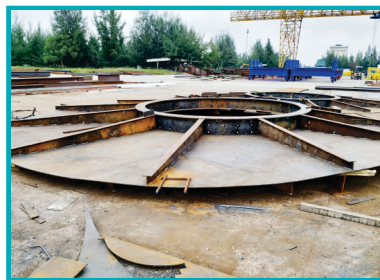


- Another criteria of a well-functioning preheater is the uniform, homogeneous distribution of the meal over the complete cross-section of the gas riser ducts.
- This is a precondition for the best possible heat transfer between gas and meal. Configuration of the meal chutes, pendulum flaps, meal inlet boxes and their adjustable dispersion plates require special design considerations on Calciner systems.

- 
- New low-pressure cyclone 270° inlet spiral with improved inlet geometry.
  - An optimum of separation efficiency and pressure drop is obtained by properly dimensioned immersion tube, separation efficiency of top stage approx. 95%.
  - Steep cones to minimize coating tendency.
  - Low gas flow velocities in the immersion tubes between 10 and 15m/sec.

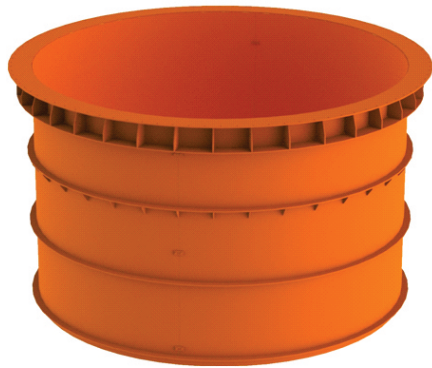
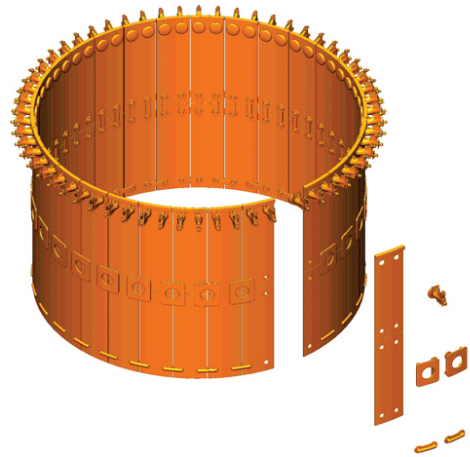
### BENEFITS :

- Easy installation.
- High functionality.
- Easy operation.
- Robust construction.
- Our Engineers are experienced & skilled who ensures, our system are functionally tested and operated as per design.



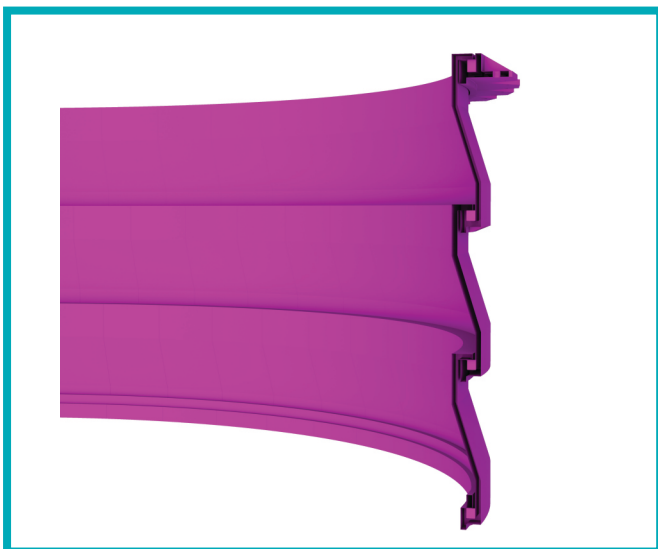
## IMMERSION TUBE

- Robust & Economical Casting design for longest lifetime
- Exceptional chemical corrosion resistance of segment sand mounting
- Easy Installation
- Less maintenance



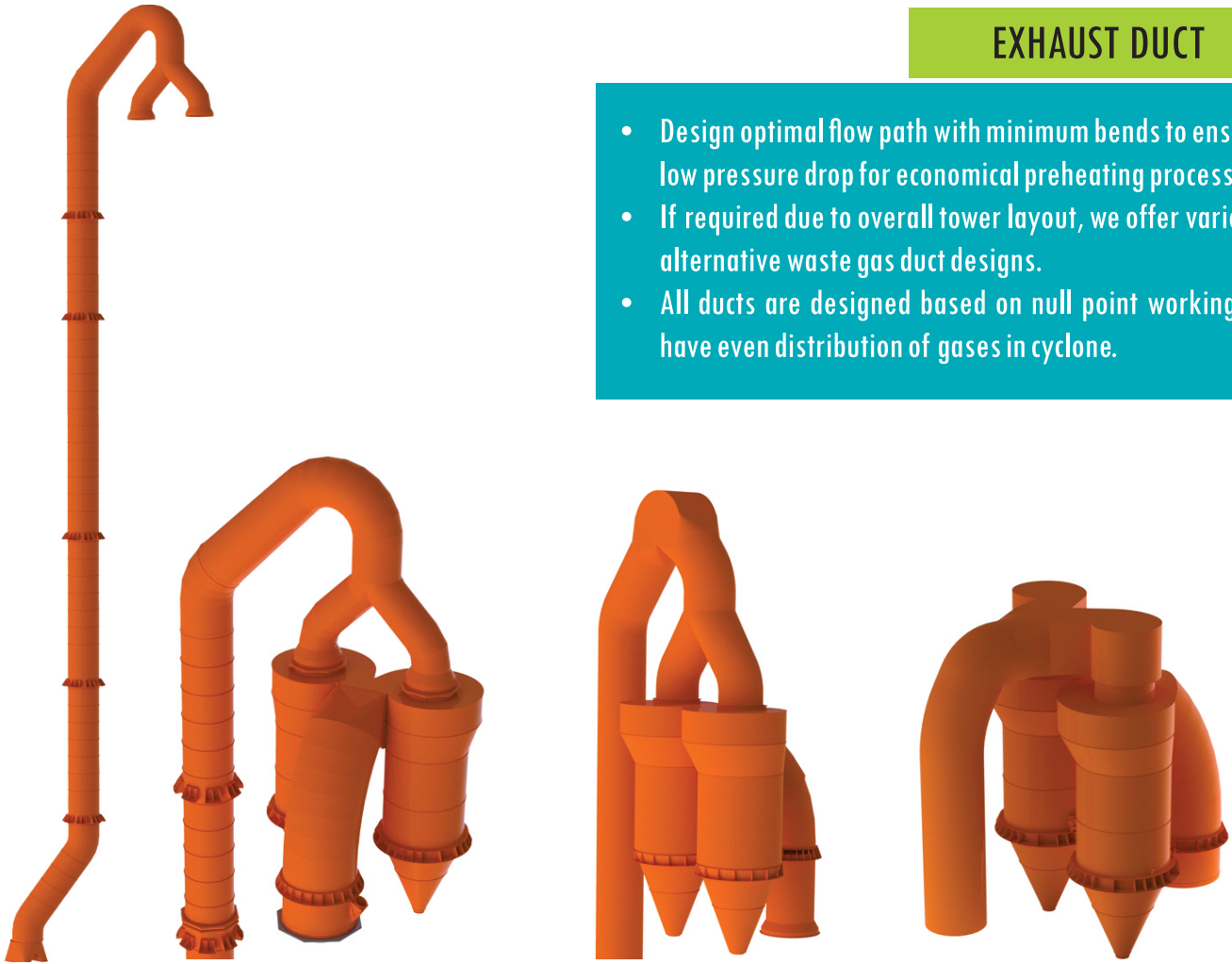
- Robust & Economical fabrication design for longest lifetime
- Exceptional chemical corrosion resistance of segments and mounting
- Easy Installation
- Less maintenance

## NEW IMMERSION TUBE DESIGN



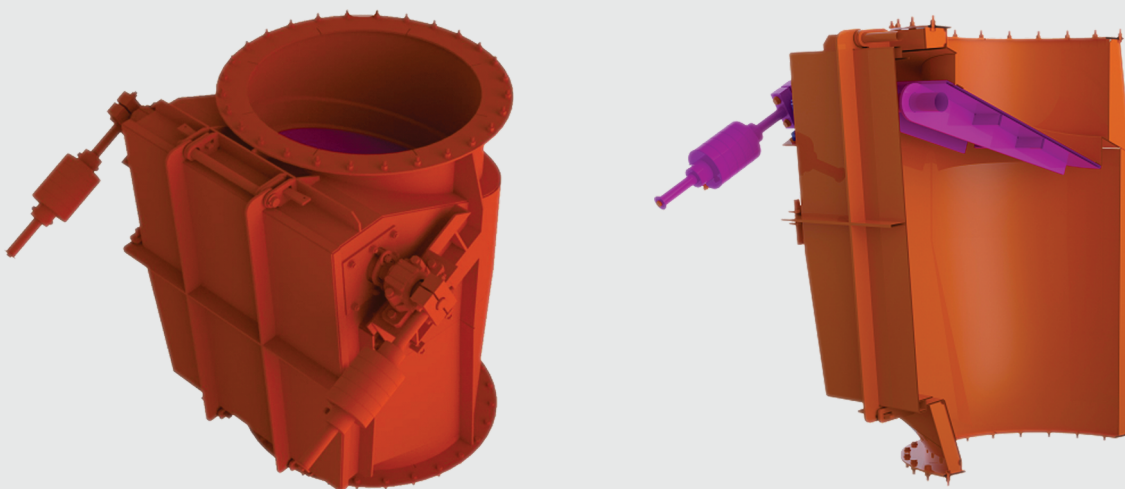
## EXHAUST DUCT

- Design optimal flow path with minimum bends to ensure low pressure drop for economical preheating process
- If required due to overall tower layout, we offer various alternative waste gas duct designs.
- All ducts are designed based on null point working to have even distribution of gases in cyclone.



## FLAP

Our Flap along with unique design dispersion box ensures good meal distribution and prevent counter gas flow between two stages of preheater avoiding any heat loss and build-up formation for better cyclone separation efficiency





## MEALPIPE

- We offer Best possible meal distribution into the hot gas flow & provides sealed design to avoid false air intrusion.
- Optimum design of Meal Pipe with suitable thickness of refractory.
- Long meal pipe consists of flap & expansion joint to ensure proper meal flow, accommodate expansions and avoid jamming.



## EXPANSION JOINT

### FEATURES

- Compensated for movements in Lateral & Traverse directions simultaneously
- Wide operation Temperature range-35 °C to +575 °C
- Custom made to fit actual working conditions
- Design as per approved international Standards

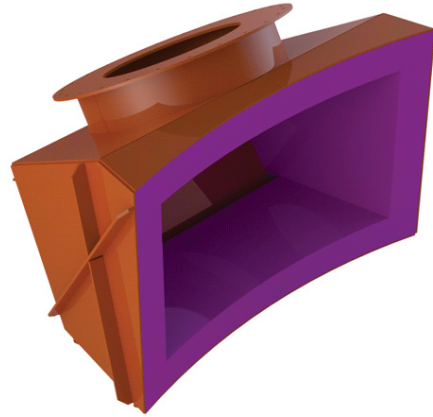
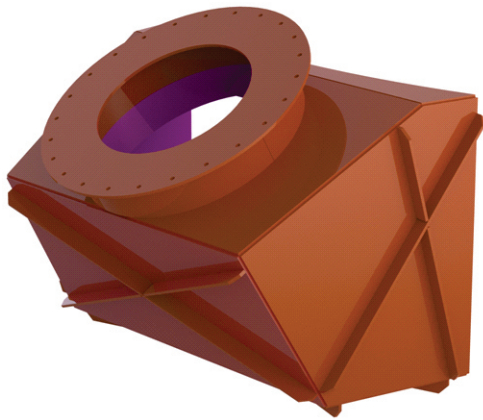


### ADVANTAGES

- Good flexibility
- High chemical resistance
- Reduced heatloss
- Minimal reaction force

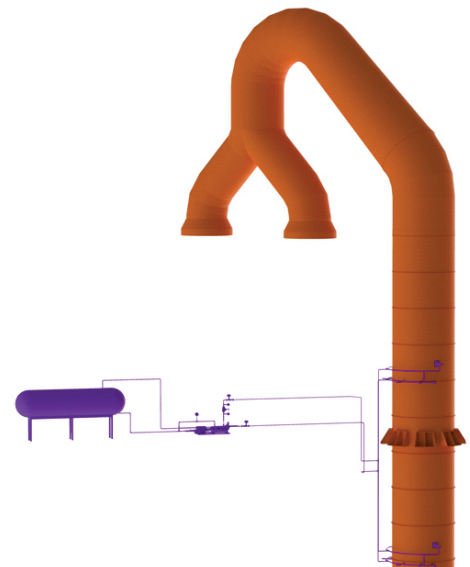
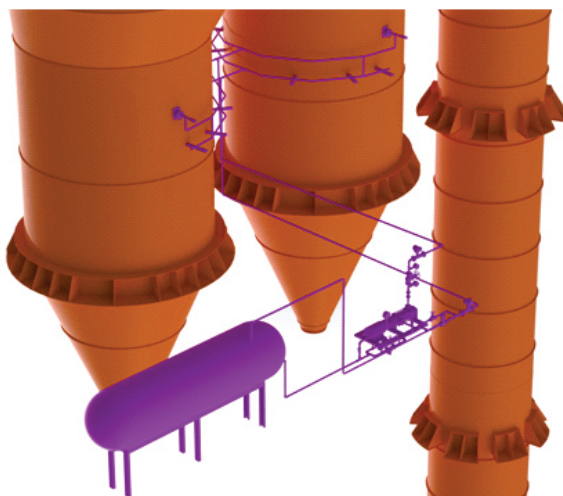
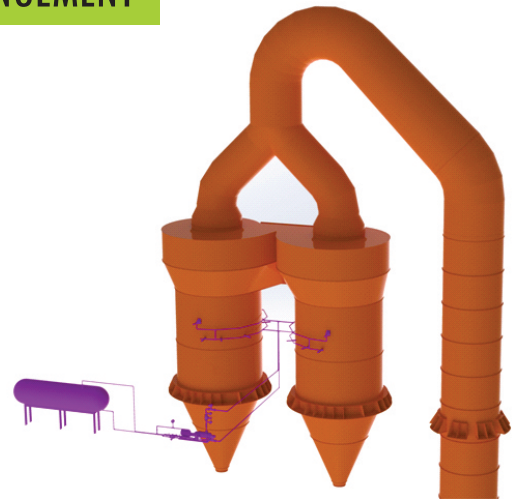
## DISPERSION BOX

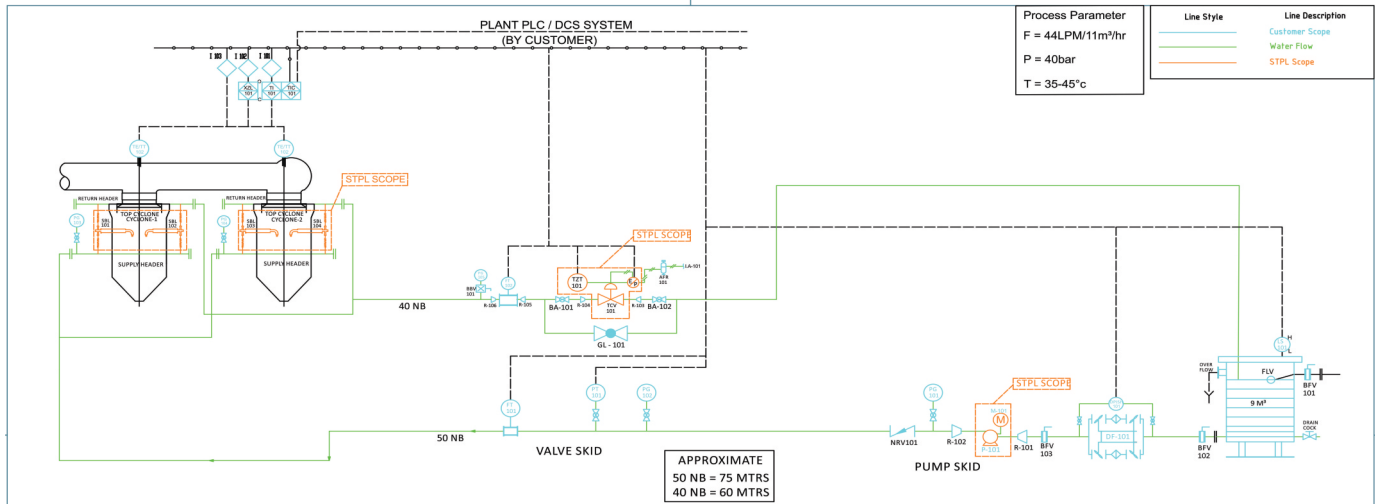
We offer Best possible meal distribution into the hot gas flow to maximize the heat transfer between meal and hot gas & providing sealed design to avoid false air intrusion.



## WATER SPRAY ARRANGEMENT

- Our Water Spray Arrangement is meticulously designed to compensate peaks in temperature & avoid material build-up.
- Increase plant capacity
- Reduce specific power consumption
- Can reduce temperature upto  $100^{\circ}\text{C}$  before preheater ID fan.
- Easy operation
- Low maintenance
- Low installation cost



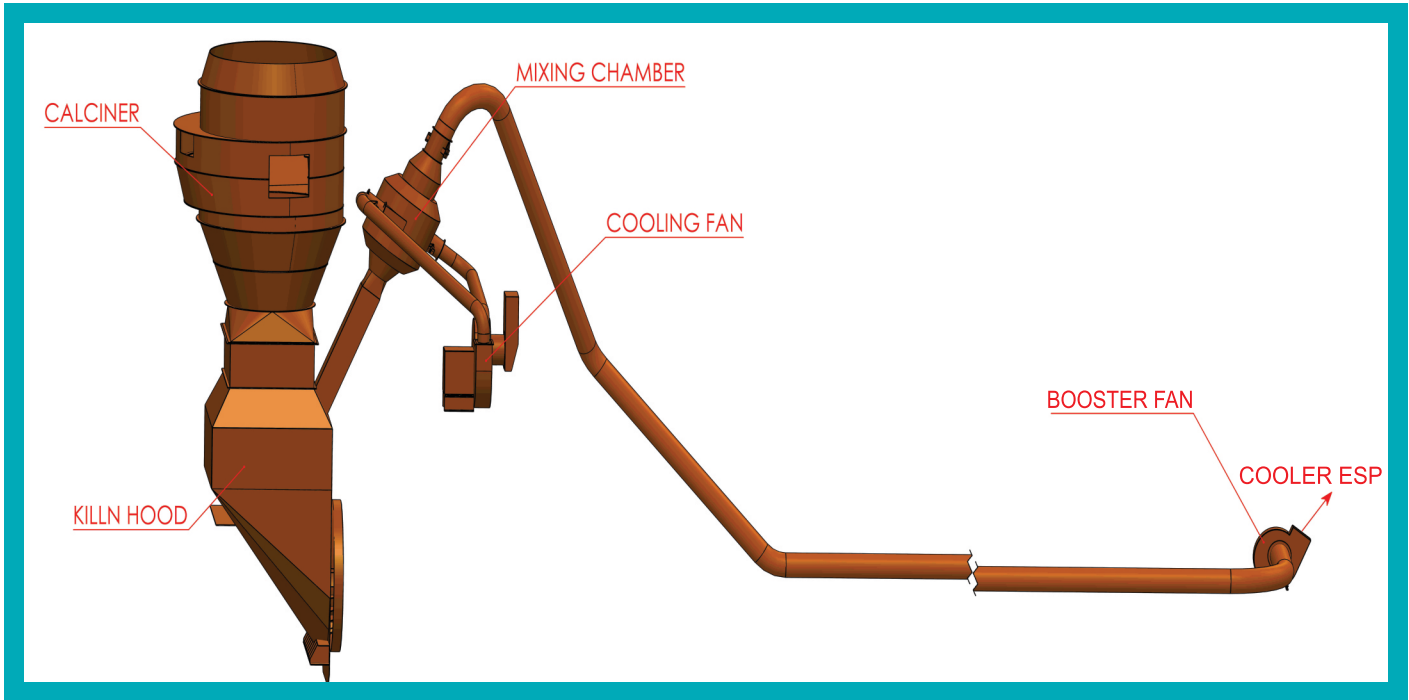


NOTE : FIRST STAGE TWIN CYCLONE C1 IN THE PLANT EACH CYCLONE (1A&1B) HAS 2 LANCES FOR COOLING

SR.NO	DESCRIPTION	DATA	SCOPE OF SUPPLY	LEVEL SWITCH	LS	LS	DIFFERENTIAL PRESSURE SWITCH	DPISH	DPISH	INTERLOCK	I	◇	NON RETURN VALVE	NRV	↗
01	TOTAL NUMBER OF LANCES	4 + 1 SPARE	STPL	DRAIN COCK	DC	DC	FLOW TRANSMITTER	FT	FT	DISPLAY IN HMI / PLC	◇	◇	GLOBE VALVE	GL	◇
02	FLOW RATE PER LANCE (@30BAR)	44 LPM @ 30BAR	STPL	REDUCER	R	R	SOLENOID VALVE - 3 WAY	XSV	XSV	MOTOR	M	M	BALL VALVE	BA	◇
03	PUMP CAPACITY WITH MOTOR		STPL	DUPLEX FILTER	DF	DF	ON-OFF VALVE	XV	XV	PUMP	P	P			
04	MOTOR RATING	30 KW	STPL	BUTTERFLY VALVE	BFV	BFV	PRESSURE TRANSMITTER	PT	PT	SPRAY LANCE	SBL	SBL			
05	I/O LIST / CABLE SCHEDULE		CUSTOMER	HEADER			TEMPERATURE ELEMENT / TRANSMITTER	TE/TT	TE/TT	PRESSURE GAUGE	PG	PG	AIR FILTER REGULATOR	AFR	◇
06	PLC BASED CONTROL SYSTEM		CUSTOMER	TEMPERATURE ELEMENT / TRANSMITTER	TE/TT	TE/TT	PRESSURE GAUGE	PG	PG	AIR FILTER REGULATOR	AFR	AFR			
07	WATER TANK & LEVEL ACCESSORIES		CUSTOMER	INSTRUMENT AIR	IA	IA	BLOCK AND BLEED VALVE	BBV	BBV	LIMIT SWITCH	XZS	XZS			
08	PLC BASED CONTROL SYSTEM		CUSTOMER												
09	TEMPERATURE ELEMENT/TRANSMITTER		CUSTOMER												
10	CABLE SUPPLY, LAYING, TERMINATION		CUSTOMER												
11	INSTRUMENT AIR SUPPLY FOR PNEUMATIC ACTUATED VALVES		CUSTOMER												
12	COMPRESSED PROCESS AIR FOR PURGE AIR		CUSTOMER												

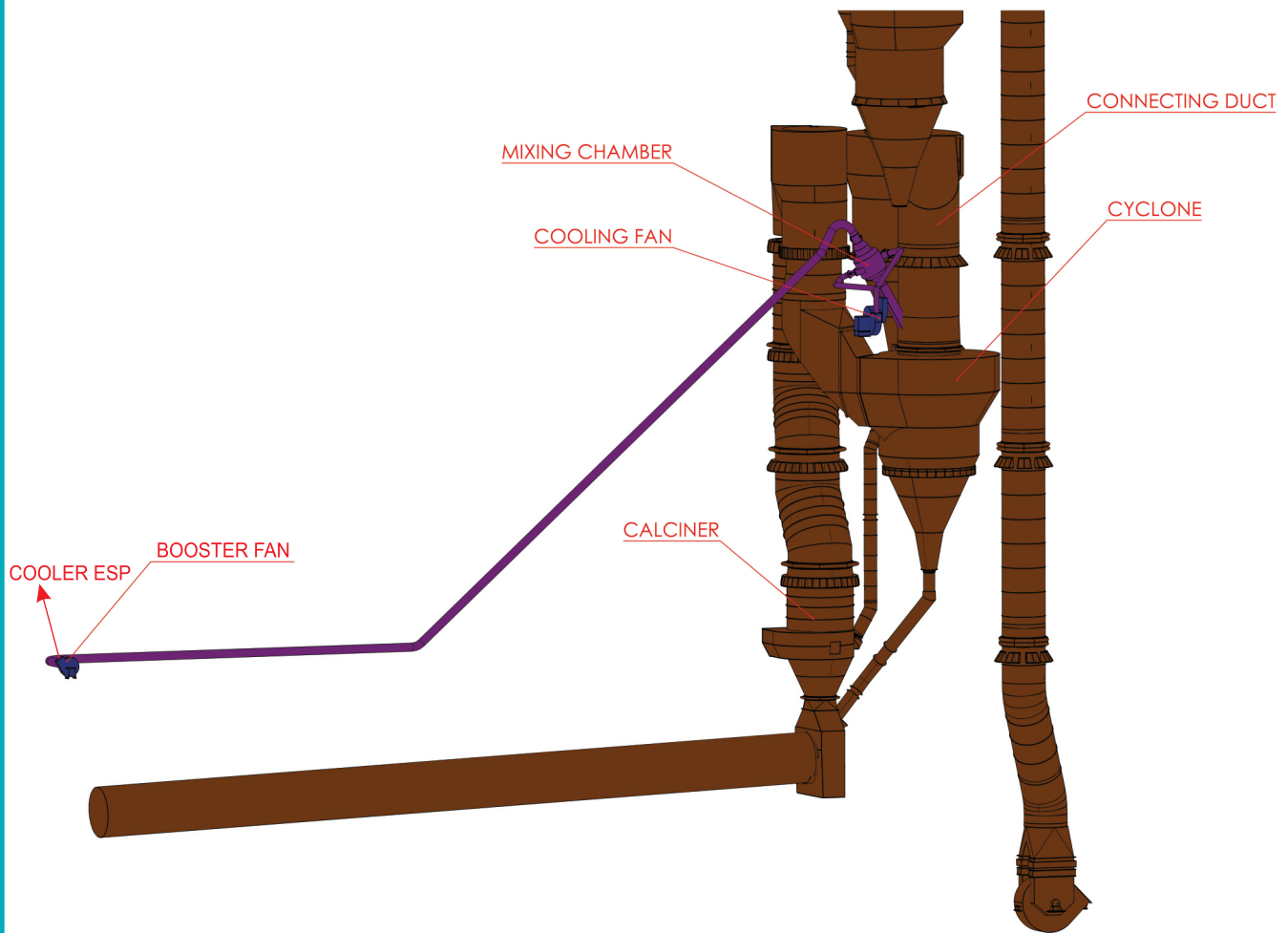
## ALKALI BYPASS

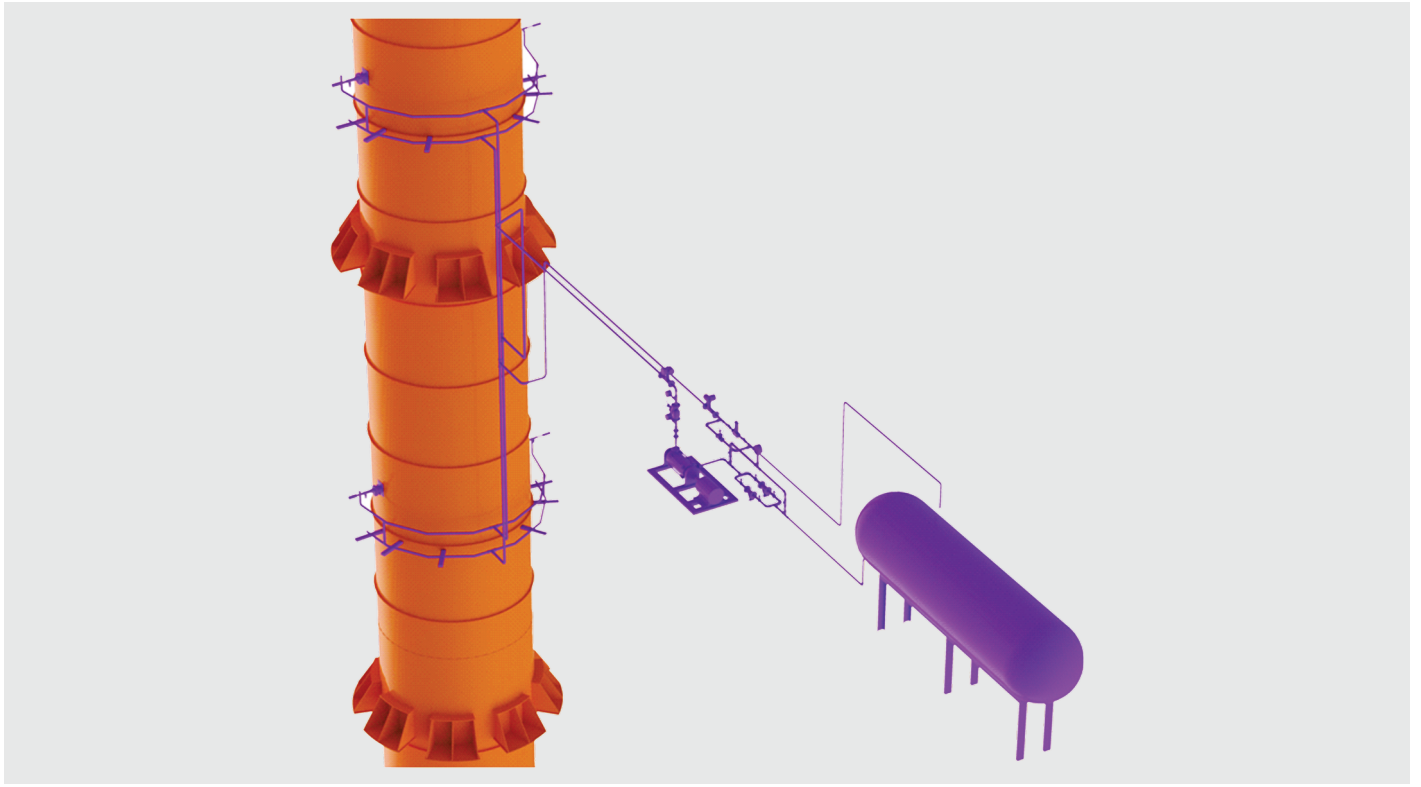
- Low investment cost
- Effective reduction of alkali.
- No additional requirement of disposal equipment or location.
- Simple operation.
- Can be incorporated in existing control system with simple PID operation.



## CHLORIDE BYPASS:-

- Low investment cost
- Effective reduction of chlorides.
- No additional requirement of disposal equipment or location.
- Simple operation.
- Can be incorporated in existing control system with simple PID operation.





Founded in 2004, Saiphia Group has shown high potential to grow, to grasp the hold over market of cement plant equipment, Technologies and services. Having more than 13 years of experience in the cement industry sector, Process engineering, project management and Futuristic solutions are among the core competencies of the group. We offer a wide spectrum of products and services for the cement industry. With distinct focus on the development of environmental friendly and energy-efficient solutions for pyroprocessing sections of cement plants. Saiphia helps its clients to continuously improve production performance, raise efficiency and ensure long-term environmental sustainability. The head office of Saiphia Group is based in Bhopal, Madhya Pradesh, which coordinates it's international operating 2 suboffices in Brazil & Bangkok.



- Head Offices
- ▲ Sub Offices (Up Coming)

**“HELPING YOUR PLANT TO BREATH”**

**We Know How ?**

**SAIPHIA GROUP**

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