

SWIRL FLAME KILN BURNERS



- **Adjustable Nozzle Area**
- **Low Primary Air (Heat Economy)**
- **Adjustable Flame Shaping**
- **Stable Flame Front**



Singhania
System Technologists Pvt. Ltd.



INTRODUCTION :

M/s. Singhania System Technologists Pvt. Ltd. (SSTPL) is an engineering company with their design, engineering facilities at Mumbai, India & Manufacturing facilities at Palghar near Mumbai. SSTPL have mastered the art of Kiln Firing System and design Kiln Burners specifically to suit the different kind of fuels, products and working conditions. The company has a dedicated team of chemical, mechanical and electrical engineers, who have proven their capabilities by designing and installing quality Combustion Equipments such as Rotary Kiln Burners, which has benefited the customers millions of dollars worth fuel and energy. The Engineering team has over 500 man-years of working experience behind them.

SSTPL'S DESIGN:

Swirl Flame Multi channel Burners (by SSTPL) are designed to achieve the best suited flame for individual Kiln requirements, while ensuring low NOx emissions. The operating principle of the kiln burner is a step wise combustion which stage wise mixing of fuel and air at appropriate stages in order to achieve a controlled combustion. The adjustable burner front nozzle tips for the axial and swirl air can achieve the best possible flame shape, as per the customer's requirement. To achieve this, the burner system incorporates a unique design, which ensures the flame shaping during the burner operations by change of air momentum by changing the relative position of the burner front nozzles. In the conventional multi channel burners the flame shaping is achieved by changing the quantity of air through various channels such as axial, swirl etc. However, as the burner design and operating conditions normally do not match, much is left to be desired when control on primary air quantity used gets exhausted. To overcome this short coming and achieve the best flame momentum, SSTPL have designed the burner system which achieves the desired tip velocities by adjusting the relative positions of the burner tips, even when burner is firing. The unique adjustable action jack screws and flexible joints provided for the adjustments of relative positions makes the burner operators dream comes true.

BURNER COFIGURATION

Axial Air Stream :

The Axial Air Stream is discharged through various variable openings which creates the air jets to the perfect concentricity with respect to the burners outer pipe. These high velocity jets also make sure strong recirculation of combustion gases of high CO₂ contents into the flame base which ensures the reduced oxygen concentration.

Pulverized Coal/Pet Coke and /or Producer Gas Stream :

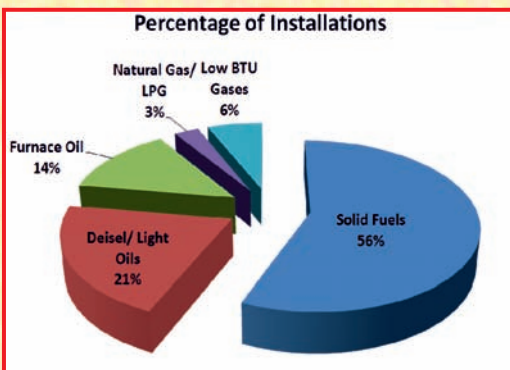
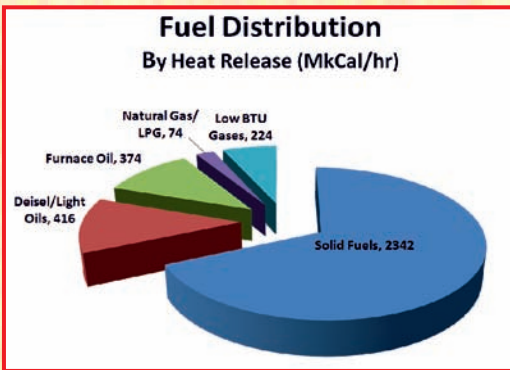
This stream discharges the fuel between the two air stream known as 'Swirl Air Stream' and 'Axial air Stream". Since, the fuel stream is sandwiched between the two air stream as it is discharged inside, it helps the fuel - air mixing, for the desired combustion.

Swirl Air Stream :

The Swirl Air Stream imparts the swirl action to discharge particles of coal / atomized oil. Swirl air nozzle is kept behind the axial air nozzle and this arrangement avoids too fast expansion of air flow thus enabling better flame shaping.

Stabilizing Air Stream :

The stabilizing air uses a flame stabilizer which ensures the recirculation of Core Eddies thus providing perfect stability at the flame root even with the low firing rate and cold starting condition.





FLAME MOMENTUM

In all modern day burners, flame momentum is considered the best parameter to understand the flame characteristic and burner operations. SSTPL Kiln Burners use 6 % to 7% primary air and can achieve the flame momentum of 1400 to 2500 percent m/sec to achieve the best flame shape. High flame momentum burner is the ideal choice for White cement applications for fuels like Pet coke.

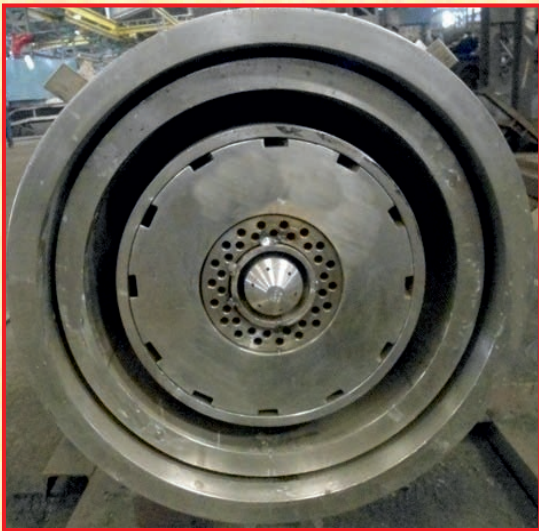
The higher velocity through burner creates eddies due to the vacuums created by injection velocities. The Hot secondary air from cooler will get automatically injected in to the roots of the flame, there by ensuring quick burning of the fuel on the coal discharge path, which creates the narrow, short and radiant flame.

The unique adjustment mechanism of the nozzle area on axial air tips are provided with position indicators across flexible joints & the pressure gauges on individual air streams. This helps operator to set the burner very precisely for stable functioning of kiln.



WHY SSTPL BURNERS?

1. Unique design with **adjustable air nozzle tips** for the desired flame shaping.
2. **Low primary air consumption** (Only 6% to 7% of theoretical combustion air) ensures efficient utilization of more hot secondary air and saves fuel.
3. **Stable flame front**
4. **Low NOX** emission.
5. **Flexibility to use multiple fuels** such as pulverized coal, petroleum coke, fuel oil, gas, agro-waste, oil sludge or mixture of these fuels.
6. Produces short, narrow, uniform and radiant flame, which results in better heat transfer between the flame and material.
7. Gives a **dense, stable coating** in the burning zone.
8. Suitable for firing with **alternative fuels**.



BURNER ACCESSORIES :

- Motorised/manual overhead/ground Burner trolleys
- Steam / Air / Pressure atomized Oil Burner guns.
- LPG / Natural gas fired Pilot Burners
- PF / PHF units for start up / oil burners
- Valve Skids
- Fuel Oil Unloading & Storage Systems
- Primary air Blowers
- Coal/ Petcoke Storage and Handling Systems
- Flame safeguard and Burner Management System



APPLICATIONS :

- Grey & White Cement
- Lime Calcination for Paper plants
- Pelletizing of fines for Steel Industries
- Mineral Processing such as Bauxite, Keonite, Magnesite, Dolomite, Alumina etc.
- Abrasive grade refractories.
- Chemicals such as Sodium, Dichromate, Titanium Dioxide etc.

OTHER PRODUCTS

Combustion & Heat Transfer Products

- Hot Gas Generators/ Air Heaters
- Register Burners
- Calciner Burners
- Lean Gas Burners
- Gas Igniters
- Multifuel Industrial Burners
- Startup Burners
- BMS Control Panels



Inertisation & Fire Suppression Systems

- Inert Gas Generators
- CO2 Based Inertisation System
(High And Low Pressure)
- PSA Nitrogen Generators



Fuel Handling & Control Systems

- Fuel Oil Unloading, Storage & Transferring Systems
- Heavy Oils Pumping & Heating System
- Oil Pumping & Filtering Stations
- Solid Fuel Conveying & Metering System
- Oil Trains
- Gas Trains



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AN ISO 9001 : 2008 COMPANY



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