

Conference on Alternate Fuel & Raw Material Utilization 23 – 24 November 2016, The Leela, Mumbai



Technological Advancements in Co-Processing



A Member of LOESCHE Family

OUTLINE

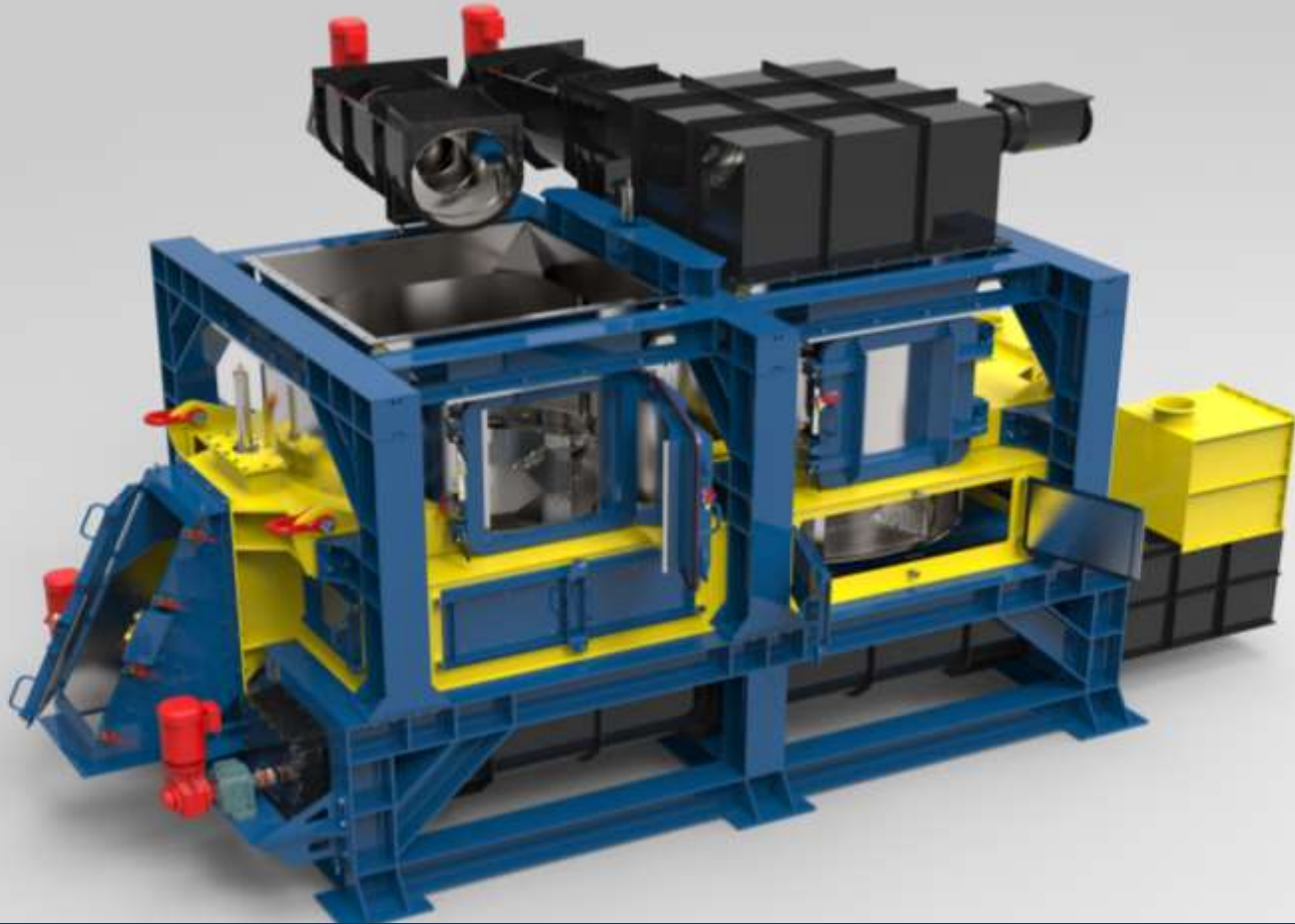
- Introduction
- AF Preparation - A TEC Rocket Mill
- SAF Drying
- Maximize AF utilization in Calciner
 - Combustion Chamber
 - Post-Combustion Chamber (Mixing Chamber)
- Reference project
- Increase TSR in main burner
- Summary

General requirements for using AF

- Maximum reduction of fuel costs
- High clinker quality
- Stable condition in operation
- Low maintenance
- CO₂ reduction

Improvement in AF quality is necessary to
achieve this and increase TSR in Cement Plants

A TEC ROCKET MILL

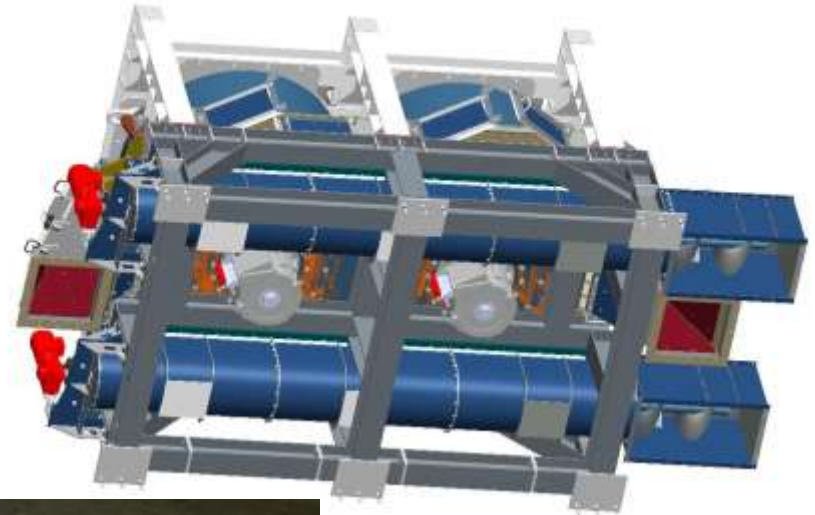


A Tec's innovation for alternative fuel preparation

A TEC ROCKET MILL

General information

- Two Grinding chambers
- Power controlled
- Direct drive



Grinding tools

- Four horizontally rotating chains
- Special chain links
- Perforated screens



A TEC ROCKET MILL

Advantages of the A TEC Rocket Mill

- Smallest particle sizes possible (<15 mm)
- Variable product size possible by changing perforated screen
- Higher specific surface (improved shredding technology)
- Reduction of inorganics (ash)
- Reduction of moisture (drying effect)



Higher calorific value of final product

Higher specific surface (improved shredding technology)

Samples below show final size < 15 mm

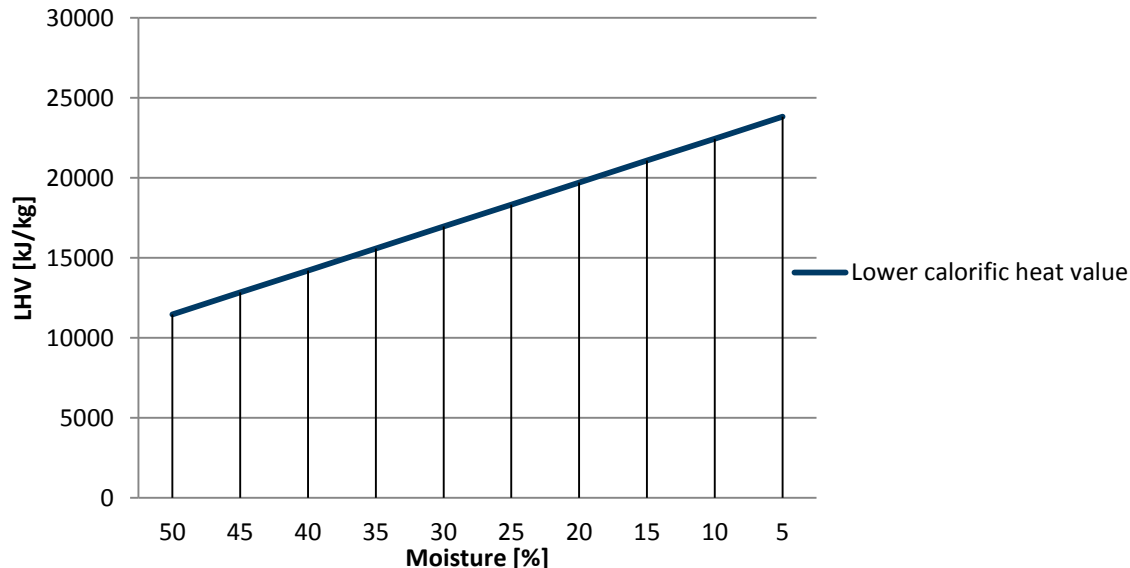


A TEC ROCKET MILL



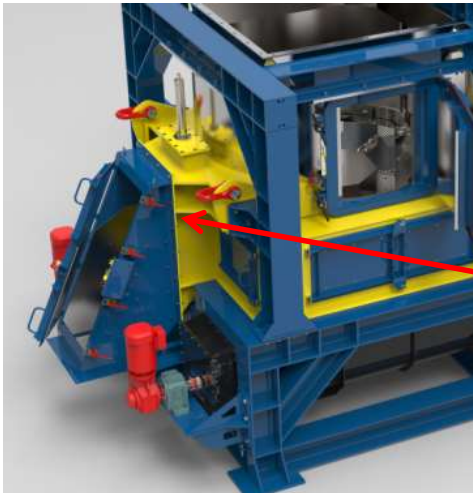
Advantages of the A TEC Rocket Mill

- Simultaneous drying in Rocket Mill
- Total moisture reduction approx. 10 %
- Additional drying with process waste gas (optional)



Advantages of the A TEC Rocket Mill

- Reduction of inorganics (ash)
- Easy discharge of inorganics



Final Product

- The maximum size of final product with a screen with \varnothing 15 mm is max. 15 mm approx. 50% < 5 mm.
- Increased specific surface (“fluffy” like cotton)
- Drying effect during the grinding process approx. 10 %
- Additional drying with process waste gas



Positive Impact on Pyroprocess

- Better burnout of AF in kiln due to improved physical properties
- High clinker quality
 - Reduction of Fe²⁺ content (brown clinker)
 - Less sulphur circulation
- Less water content in system
- Higher substitution rates and higher capacity
- Stable condition due to more homogenized product

A TEC ROCKET MILL

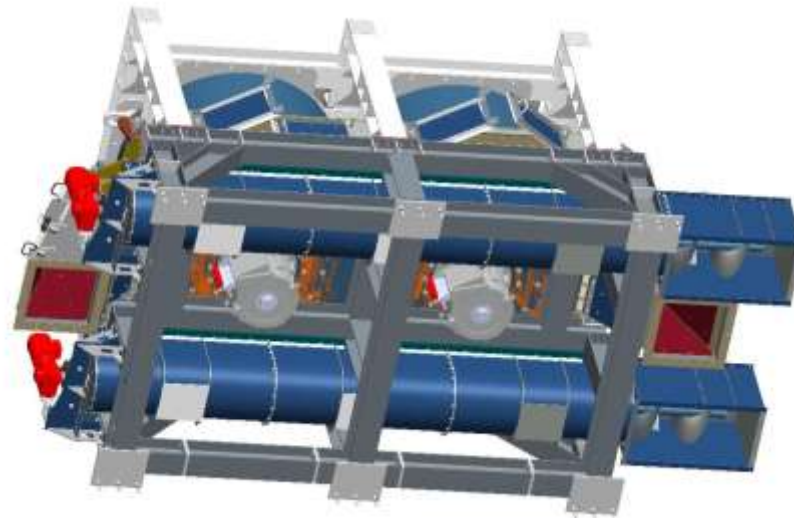
Technical data

Final product size	< 15 mm	< 60 mm
<i>Screen size</i>	Ø 15mm	rectangular 40 x 50mm
<i>Output size</i>	< 15 mm / ~ 50% < 5 mm	< 40 mm / ~ 40% < 20 mm
<i>Throughput</i>	~ 8 t/h	~15 t/h
<i>Specific power consumption</i>	70 kWh/t < 15 mm final	40 kWh/t < 60 mm final
<i>Dimension</i>	8.530 x 4.160 x 6.000 l x b x h (mm)	
<i>Weight</i>	60.000 kg	
<i>Drive Unit</i>	2 x 315 kW	
<i>Rotor Speed</i>	~ 580 min ⁻¹	

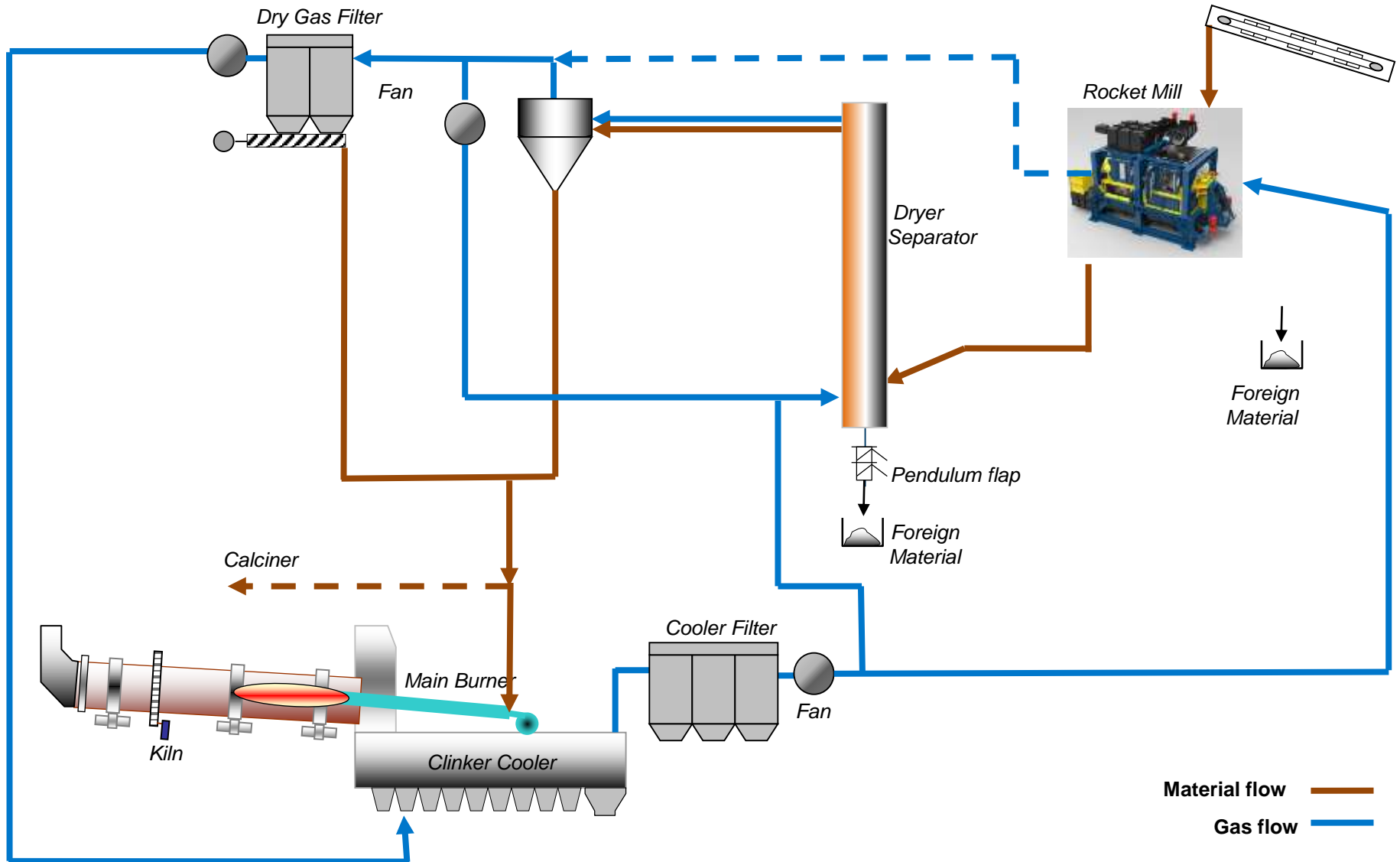
Maintenance & Wear costs

Life time wear parts	chain approx. 300h screen approx. 1000h	
Wear costs	3,50 (15mm) / 1,75 (60mm)	€/t
Time for changing one set of wear parts	approx. 1-1,5	h/unit
Maintenance/cleaning	5	h/week

ROCKET MILL *animation*



SAF DRYING

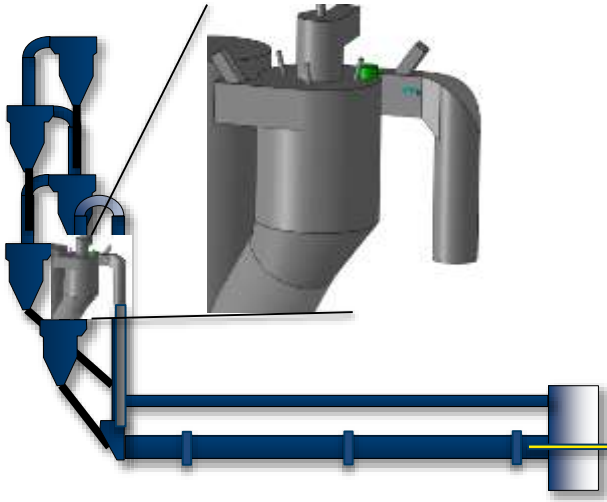


Advantages

- Maximum reduction of moisture content
- Additional separation of inorganics(ash)
- Less wear in the transport system
- Higher specific surface (improved shredding technology)

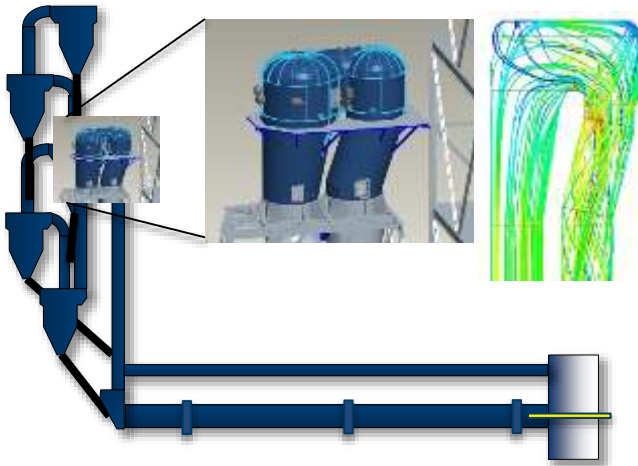
Highest possible calorific value of final product

MAXIMIZE AF UTILIZATION IN CALCINER



Combustion Chamber

- Provides optimized conditions for ignition in hot air (Tertiary air with 21% Oxygen)
- Increase in retention time allows combustion of bigger particles



Post-Combustion Chamber

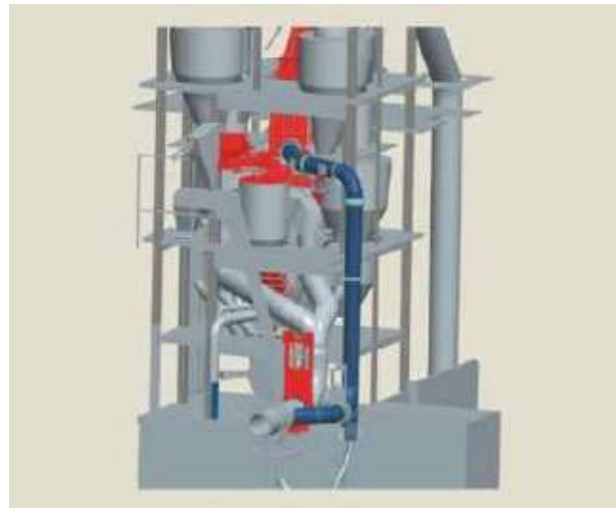
- Ensures burn-out after high feed rates of complex fuels (AF)
- Mixing of strands Improves burn-out and SNCR process

> 90 % TSR in Calciner possible

REFERENCE PROJECT



Calciner loop duct



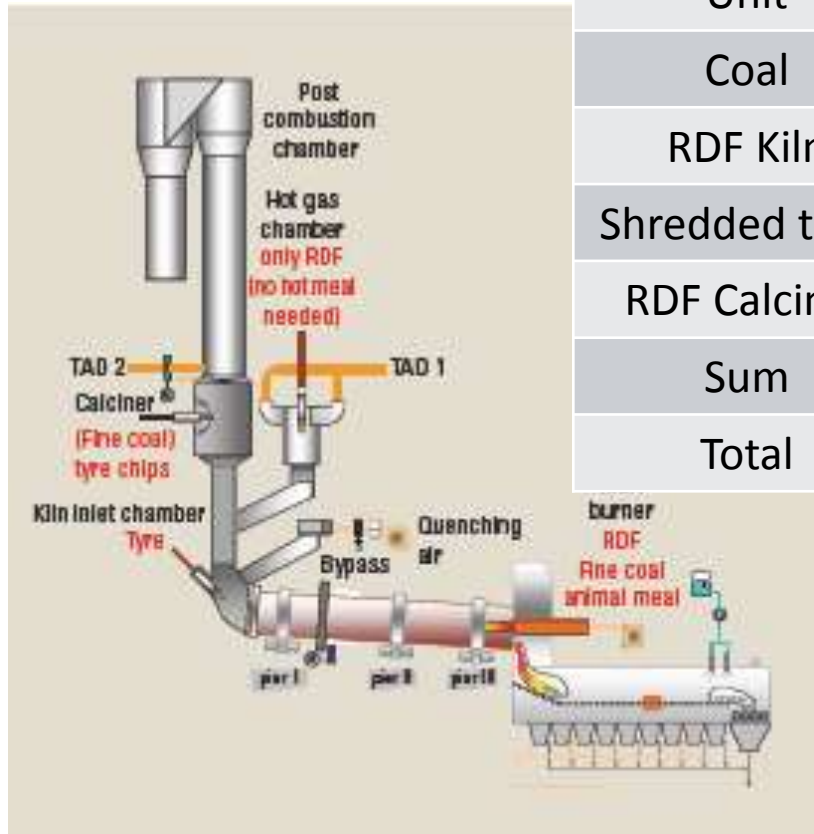
Combustion Chamber



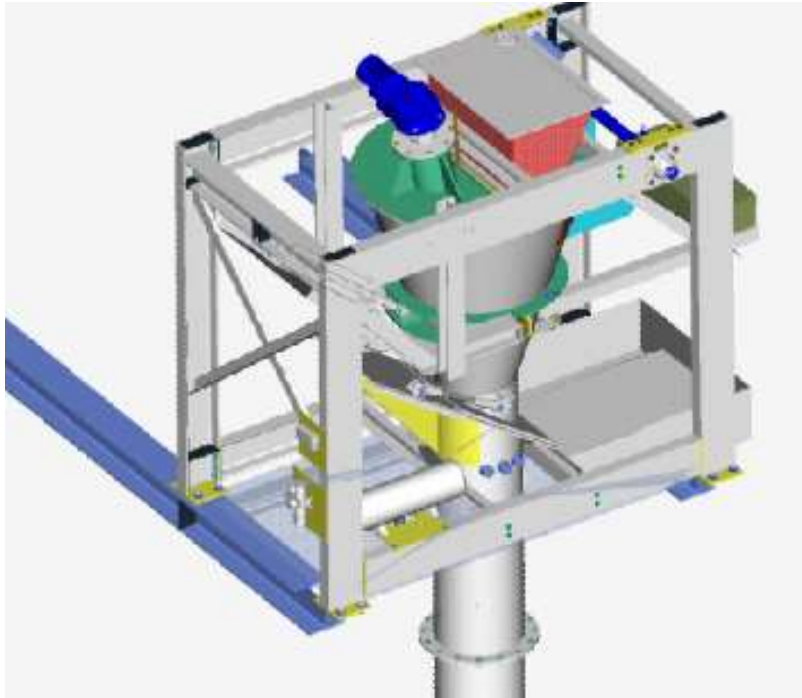
Post-Combustion Chamber

REFERENCE PROJECT

Fuel Type	LHV	Kiln		
		Kiln Burner	Bottom Part	Comb. Chamber
Unit	MJ/kg	%	%	%
Coal	28	35		4
RDF Kiln	20	11		
Shredded tyres	28		15	
RDF Calciner	18			35
Sum		46	15	39
Total		46	54	

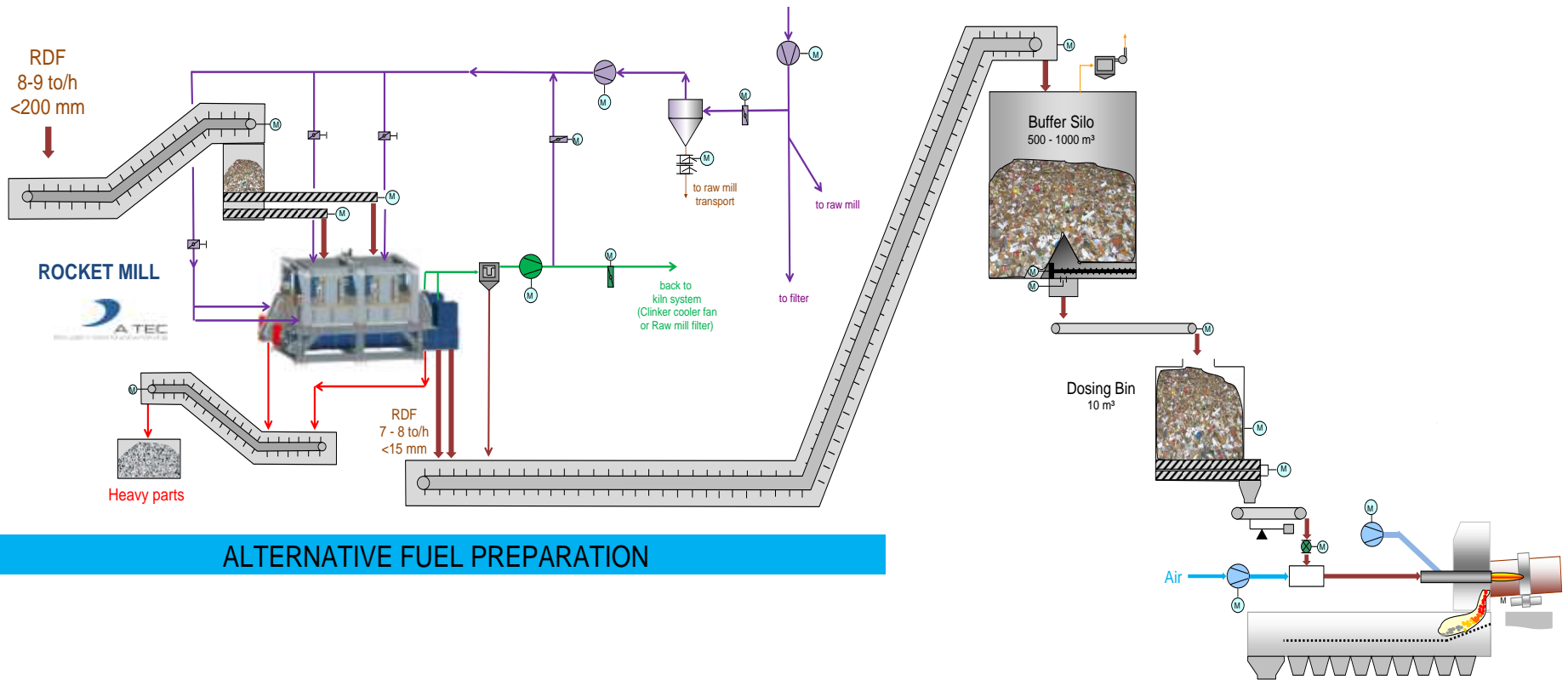


A TEC SWING CHUTE



The Swing Chute is used as safety equipment for feeding alternative fuels in the combustion system. In the event of an operating problem, the gravity-driven chute swivels out and completely closes the combustion system. *No drive is required.*

INCREASE TSR IN MAIN BURNER



High quality AF produced in Rocket mill and A Tec expertise in fuel injection system optimization will make 60 - 70% TSR in main burner possible.

SUMMARY

- Improving AF utilization in cement plants requires High quality AF.
- Dried AF with higher specific surface, produced using Rocket Mill *plus* Dryer separator, assists fast burn-out and maximizes TSR.
- A Tec Combustion chamber and post-combustion chamber enables >90% TSR in Calciner with stable kiln operation.
- Increasing TSR in main burner requires high quality AF and expert evaluation to modify / replace main burner.

SUMMARY

- Based on our expert knowledge in PYROPROCESSING and ALTERNATIVE FUEL PREPARATION, we have comprehensively optimized a complete solution covering all crucial steps from engineering to supplying equipment and plant construction.
- As a complete system supplier with long term experience in waste treatment and handling, we are able to guarantee significant commercial and environmental benefits.

Please contact us for your requirements in Alternative Fuel preparation, transportation and feeding systems

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THANK YOU

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