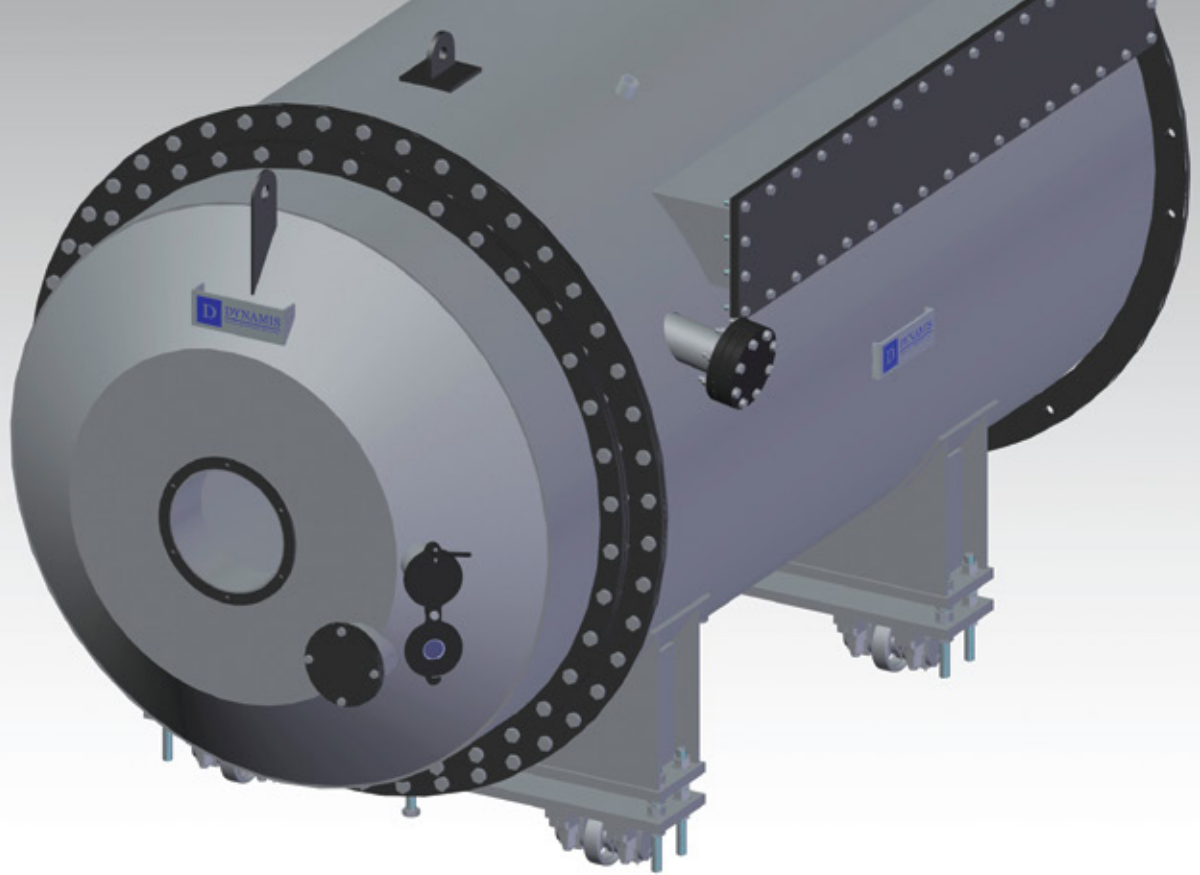




# D-GASIFIER

The ultimate solution  
for the replacement of  
gaseous and liquid fuels





## Cost Reduction and **TOP PERFORMANCE**

The D-GASIFIER is an innovative equipment patented by Dynamis that allows the use of 100% solid fuels in low temperature processes that normally run on gaseous or liquid fuels. It offers considerable cost reduction opportunities, when fuel price becomes a critical factor.

The chamber works as a gasifier and only part of the total air required for complete combustion is injected into the chamber. As result, it is a very compact equipment, perfect for the replacement of conventional burners (gas or fuel oil fired).

### **OPERATION AND ATTRIBUTES**

To start up the operation, the D-GASIFIER must be pre heated with an auxiliary fuel, which can be gaseous (natural gas, propane, LPG - Liquefied Petroleum Gas) or liquid (diesel oil, heavy fuel oil).

After the preheating period (45 to 60 minutes), the injection of solid fuel can be initiated. At a given starting temperature the process becomes self-sustaining, thus requiring no auxiliary fuel to ensure the stability of combustion.

The D-GASIFIER can be used to burn a large number of solid fuels (including biomass). An auxiliary burner (for liquid or gaseous fuel) can also be installed, allowing multi-fuel operation (0% to 100%).

### **MAIN ATTRIBUTES**

- › **Friendly and Easy Operation**
- › **High Turndown 3:1**
- › **High Efficiency (over 95%)**
- › **Full remote and automate operation**
- › **Low Footprint**

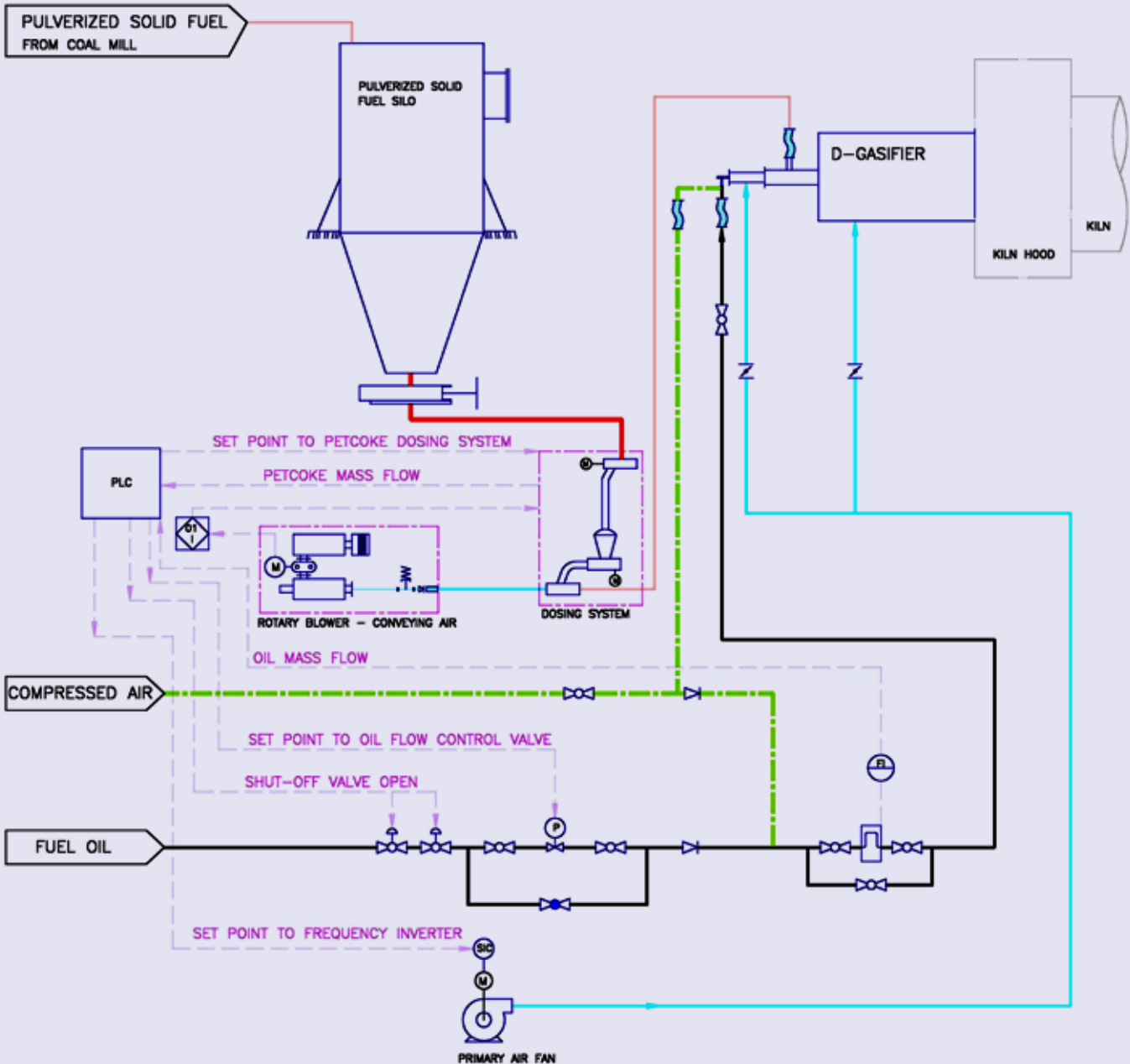
# D-GASIFIER

## System Flowchart

### SYSTEM DESCRIPTION

The D-GASIFIER is part of a system that involves a series of equipment and instruments.

The following flowchart presents the overview of a standard combustion system indicating all equipment and instruments necessary for the operation, and how the D-GASIFIER chamber fits into the entire process.





# APPLICATIONS

The D-GASIFIER finds application in:

- › **Rotary, Grate and Vertical Kilns**
- › **Calciners and Furnaces**
- › **Rotary, Rapid, Flash and Fluidized Bed Dryers**
- › **Hot Gas Generators**

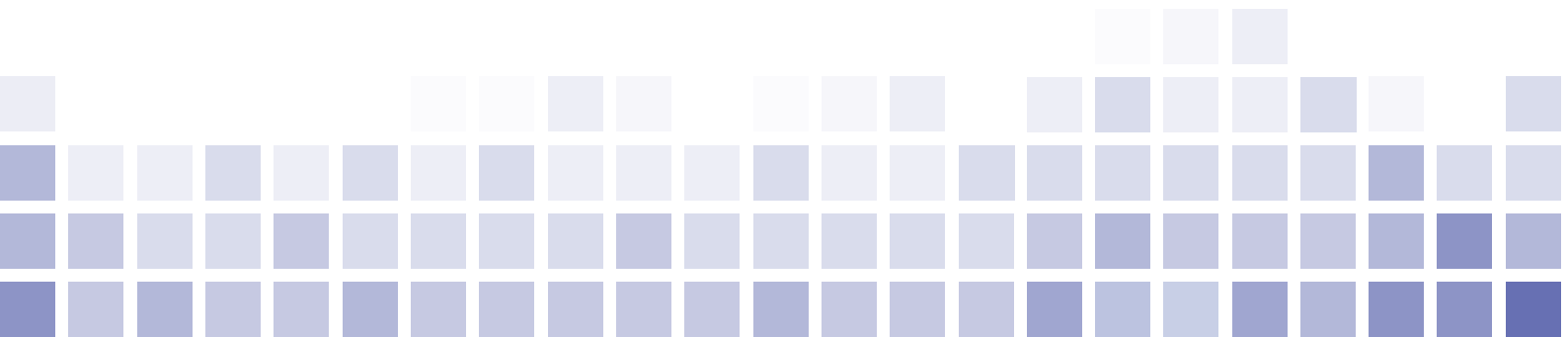


## ROTARY KILNS

The characteristics of a D-GASIFIER installed in a Rotary kiln are shown in the chart below:

The same type of D-GASIFIER finds application in other kilns for lime, lightweight aggregates, diatomaceous earth, activated clay, perlite and expanded shale, to mention but a few.

|                           |   |
|---------------------------|---|
| capacity                  | 16.0 Gcal/h (63.5 MMBtu/h)                                    |
| fuel                      | petcoke, bituminous coal and charcoal                         |
| fuel sulfur content       | 6.5% (max)  |
| primary air ratio         | 30% (related to stoichiometric air)                           |
| primary air temperature   | ambient (25°C or 77°F)  |
| secondary air ratio       | 145% (total excess air of 175% related to stoichiometric air) |
| secondary air temperature | 400°C or 750°F)   |





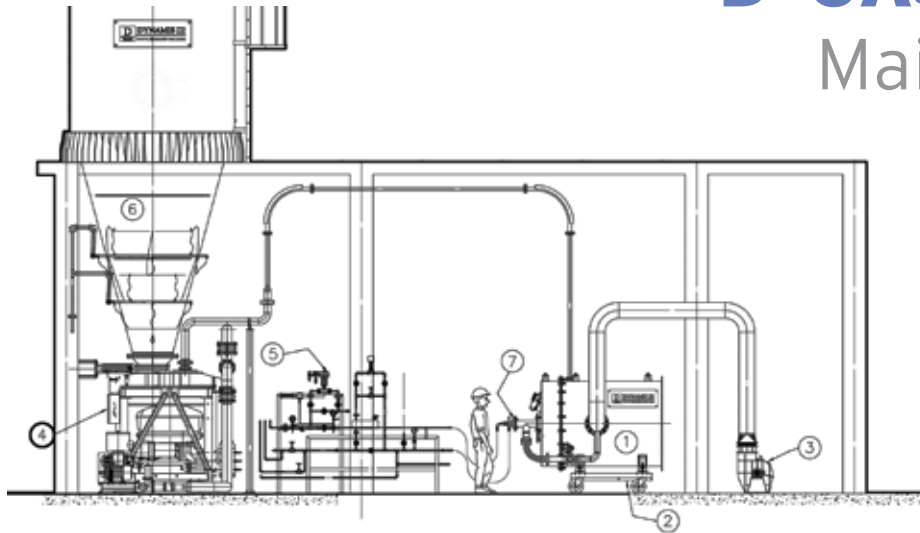
## HOT GAS GENERATORS

The chart below presents the main characteristics of a D-GASIFIER designed to supply hot gases to a cement mill:

|                           |   |
|---------------------------|---|
| capacity                  | 6.0 Gcal/h (24.0 MMBtu/h)                                     |
| fuel                      | petcoke   |
| fuel sulfur content       | 6.5%  |
| primary air ratio         | 30% (related to stoichiometric air)                           |
| primary air temperature   | ambient (25°C or 77°F)  |
| secondary air ratio       | 150% (total excess air of 180% related to stoichiometric air) |
| secondary air temperature | ambient (25°C or 77°F)  |

# D-GASIFIER

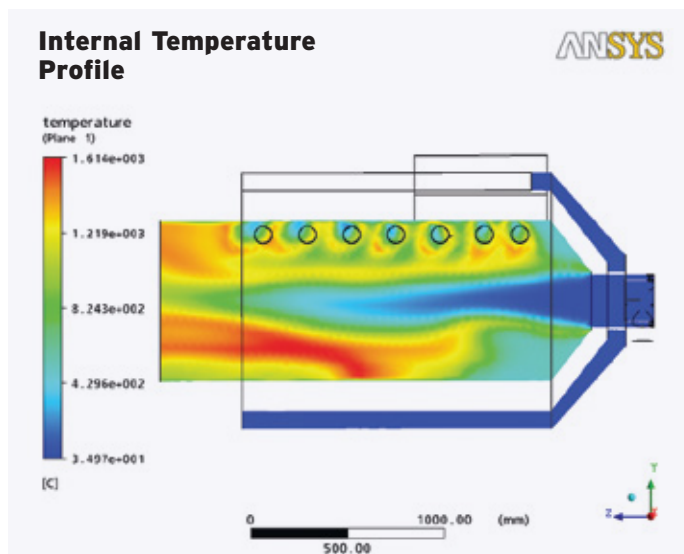
## Main Components



- 1 Pre-Combustion Chamber
- 2 Chamber Carriage
- 3 Primary Air System
- 4 Dosing System
- 5 Auxiliary Fuel Control Rack
- 6 Pulverized Solid Fuel Silo
- 7 Pre-Heating Burner

### PRE-COMBUSTION CHAMBER

Responsible for the solid fuel ignition before it is injected into the process. The chamber generates a hot stream of gaseous fuel originated from the injected solid.



The Pre-Combustion Chamber main characteristics are the following:

- › **High TEMPERATURE**  
Up to 1500°C (2800°F)
- › **High TURBULENCE**  
High swirl
- › **High Residence TIME**  
Fuel particles spin

### PRIMARY AIR SYSTEM

The variable speed of the primary air fan controls the combustion airflow to the chamber, usually maintained below 40% of stoichiometric air.

### PRE-HEATING SYSTEM

The preheating burner has a single primary air inlet. This burner has a shaping air divided in two flows - axial and tangential components.

A lance is inserted into the burner central pipe for liquid or gaseous fuels. Compressed air is responsible for fuel nebulization, if liquid.

