

# CALIDRA GROUP

## CASE HISTORY

**Servicios Administrativos, S.A. de C.V.**  
**Cal de Aguascalientes, S.A.**  
**Calidra de Oriente, S.A. de C.V.**  
**Cal de Apasco, S.A.**  
**Caleras de la Laguna, S.A. de C.V.**  
**Caleras de Guanajuato, S.A. de C.V.**  
**Facal Purísima, S.A.**  
**Calidra de oriente, S.A. de C.V.**  
**Cal Química Mexicana, S.A. de C.V.**  
**Cales de Oriente, S.A. de C.V.**  
**Grupo Calero de Xioteppec, S.A. de C.V.**  
**Calidra de Occidente, S.A. de C.V.**  
**Calidra de Veracruz, S.A. de C.V.**



## HISTORY

Calidra, SA was founded in 1931 with the purpose of produce hydrated lime, gypsum and its derived products, installing its first lime integrated plant in Mexico, which was an innovation on the construction industry, starting with this the substitution of hydrated lime instead of quick lime.

During 1993 and until 2003 Calidra GROUP formed an association Carmeuse, leading organization in the lime market of Europe and United States, acquiring with this the state of the art technology and the fundraising for the modernization of the companies, which form the group. In the last year a new association was formed with Graymont, a company in the third place of lime worldwide, starting a new which conform the lime industry.

## PRODUCT

The lime continue being one of the products which properties have application in various sectors of industry with great benefits at low cost, and day by day more applications.

With the innovation of the acquired technology and with advanced in the implementation and improvements of its processes, Calidra Group an their specialists have developed studies in which they will require the steam application on their process.

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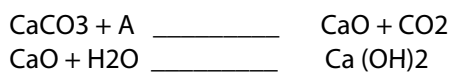
### LIME APPLICATIONS

- Metallurgical
- Chemical Industry
- Filler
- Environment
- Agro Industry
- Construction
- Food

### PROCESS AND USE OF STEAM

The lime process consists in the chemical selection, exploitation, crushing, clarification by (size) and burning, in this last part of the process, is where the steam application is being used inside the combustion system of the process ovens with the benefit of increased production at less cost.

The process into oven consist in adding the stones into an oven and put on heat at a temperature higher than 1300 °F, developing the following reactions:



Actually in the ovens, then burners use natural gas, and this as limiting characteristics in the combustion and heat transfer is supplied in the process. In the technological innovations, which they want to implement, is the use of heavy oil No. 6, which will be steam atomized. With this they will obtain benefits, such as:

More homogenization in heat transfer through the burners.

Reduced loss of heat in the process.

Less risk in fuel handling.

The steam as atomization element will have a better diffusion and heat transfer towards the combustion chamber.

The pulverization in the atomization is much better than the use of air.

Less Operating expenses.

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### PROJECT

The first step of the project that Clayton de México has with Grupo Calidra, is to supply their affiliated company Cal de Apasco, S.A. Plant No. 2 at Apasco State of México, two 100 BHP Steam Generators with all its complementary equipment and accessories mounted on a skid to supply steam to the burners of 7 process ovens, each one with a capacity of 110 tons.

The following stages will consist in supplying similar systems for the plants of Caleras de la Laguna, S.A. de C.V., at Torreón, Coah. (two 60 BHP Steam Generators) and Calidra de Oriente, S.A. de C.V. at Puebla, (two 100 BHP Steam Generators).

### CONFIGURATION

It will require 6 Clayton Steam Generators for the 3 Plants at Ciudad Apasco, Puebla and Torreón. The configuration of these systems consist in one 100 BHP Steam Generating Plant and accessories skid mounted plus a second skid mounted 100 BHP Steam Generating Plant for stand by.

Considering that these plants will be working 24 hours daily, this configuration was recommended, and will add an automatic TPS controller system for better performance.

Considering the feedwater characteristics, such as hardness and total dissolved solids, Clayton de México suggested the installation of a filtering system from reverse Osmosis and or a demineralization system, depending on the conditions.

### JUSTIFICATION OF THE FUEL CHANGE

Actually the price in US Dollars for 1 million BTU Natural Gas is 5.10 and for the Heavy Fuel is 5.55.

The internal revenue rate calculation the Company have confirmed that the investment will be profitable.