Case Study

Centrifugal Fans

Maerz Ofenbau, Germany

Howden
A Chart Industries Company

Savings of up to 20% in power consumption from Howden's high efficiency process fans

Maerz Ofenbau was able to deliver improved operating efficiencies to their customer base and future customers through integrating high efficiency fans into their process technology. Howden's high pressure centrifugal fans meet the performance requirements while reducing energy consumption, increasing flexibility to output demand and reducing capital costs.

Maerz Ofenbau AG is a world leading industrial engineering company focused on the design and delivery of lime kilns.

Their lime kiln technology is central to lime production processes used worldwide for lime supply to industries such as iron and steel, construction, water and agriculture.

Challenge

Maerz have been at the forefront of lime kiln design for over 60 years. Their parallel flow regenerative (PFR) lime kiln produces high reactive lime with the best thermal efficiency of all lime kiln types.

On this basis, it may have seemed like the large base of Maerz lime kilns operated globally had no further opportunity to improve with further reductions in thermal energy consumption almost impossible.

Maerz, however, fully embraces innovation as a way to address the challenge of ever-increasing customer demand for higher efficiencies.

Their attention moved from thermal to electrical efficiencies within the overall system as they worked with a client in Mexico to identify process improvements.

A major power consumer within the system is the combustion and cooling air supply. The common approach is to use sets of up to nine Roots type blowers to supply air for both applications. The Roots blowers can only achieve efficiencies of 60 to 65%. This led Maerz to believe that an alternative compression technology could provide the efficiency gains being sought.

The solution

Maerz approached Howden looking for a suitable replacement technology for the rotary blowers within their process. Howden's engineers worked with Maerz's engineering team to understand the process requirements for their PFR lime kiln. As experts in air and gas handling solutions, Howden has a large portfolio of compression equipment enabling the best available technology to be selected for each application.

For the lime kiln application, a high pressure centrifugal fan was recommended as the optimal choice based on its ability to meet the required performance across variations in pressure and volume. The fan had the potential to increase efficiency to over 80%. Additionally, a single fan would be able to supply all required combustion air; similarly, a single fan could be used for cooling air.

The fan solution meant that not only would existing plants be able to achieve immediate savings in power costs, but also new build plants would see reductions in capital costs.

This relates to fewer machines required and lower construction costs associated with housing the compression equipment and ducting work.

Howden's scope of supply included the complete fan with motor and a loose supplied silencer for the installation in the duct downstream of the fan.

The results

Maerz retrofitted the centrifugal fan into Grupo Calidra's lime plant in Mexico, replacing four Roots blowers that served the PFR Kiln with combustion air.

Performance efficiency varies based on kiln fuel, a mix of either natural gas or petroleum coke, but measurements taken of the operational fans showed this was in line with the theoretical model. When firing purely with gas power consumption the kiln achieved reductions of 20%, whereas with an 80/20 petroleum coke/gas mix the reduction was 18%.

Since introduction, the fan has continued to operate reliably delivering ongoing savings to the lime plant. Grupo Calidra's other plants will be accessed for the fan retrofit and new plants will adopt the centrifugal fan technology.

The success of the project has prompted Maerz to offer this solution to its global customer base with fan orders already reaching double figures as lime plants take advantage of lower operational costs and associated carbon footprint.

For more information contact our team today:

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