

## OPTIMISE TO ECONOMISE

### FAN REVAMPING FOR CEMENT PLANTS



Rotating cement mills, Los Palambres, Chile

WHERE COSTS ARE CRITICAL, REVAMPING FANS IS A HIGHLY ECONOMIC WAY OF IMPROVING CEMENT PLANT PERFORMANCE AND AVAILABILITY. BY OPTIMISING A FAN FOR ITS CURRENT OPERATING CONDITIONS OR UPGRADING IT TO REDUCE POWER CONSUMPTION, WEAR OR FOULING, SIGNIFICANT REDUCTIONS CAN BE MADE IN RUNNING COSTS.

Howden has been supplying cement plant fans for more than 40 years. Over that time we have worked with plant engineers to develop a broad range of cost effective techniques for improving performance and increasing operational life.

Older fans in particular, designed when energy was cheap, tend to have low aerodynamic performance. They are therefore obvious targets for optimisation, offering enormous potential for raising overall plant efficiency and reducing operational costs.

## HOWDEN KNOW-HOW

### REVAMPING YOUR FANS TO TAKE ADVANTAGE OF THE LATEST TECHNOLOGY BRINGS A WIDE RANGE OF BENEFITS

- **Reduced power consumption.** Replacing old fan rotors with high efficiency rotors, vane controls and frequency converters will contribute to the reduction of overall power consumption.
- **Increased output from underperforming fans.** Substituting a new rotor designed to minimise dust build-up and repositioning the inlet cone can both significantly increase output.
- **The best match to current operating conditions.** Adapting fans to suit the new system characteristics that have arisen through overall plant development and modifications can bring dramatic improvements in efficiency.

- **Reduced maintenance and longer life.**

New materials and protection techniques will increase resistance to corrosion and abrasion. This can reduce maintenance needs and substantially prolong the life of the fan.



## FAN REVAMPING FOR CEMENT PLANTS



Filter ID fan for a cement plant in Spain

### Reduced power consumption

Reducing the absorbed power can lead to significant operational cost savings. Improvement in filter technology over the past 20 years has allowed high efficiency fan rotors to be installed in most parts of a cement plant.

Considerable progress has also been made in fan regulation systems. Efficient regulation considerably reduces the operating costs at low part loads. Vane controls at the inlet are more efficient than the old style dampers. They are also safer. Operating at low part loads, a fan fitted with dampers will not only be inefficient, it runs a much higher risk of instability and ultimate mechanical failure. The technological progress and the consequent drop in price of frequency converters allows us to supply our customers with the best possible high efficiency regulation systems. And, complementing the improvements from vane controls and frequency converters, redesigned duct layouts – in particular the fan inlet and outlet – will also reduce power consumption.

### Increased output from underperforming fans

In most cases, the reason for underperformance is dust build-up, abrasion or inefficient positioning of the inlet cone.

Dust build-up is inherent to the process and there is no definitive solution to it. However, it is usually worsened by older rotor designs.

- The more blades per inlet, the more areas there are on which dust can settle.
- A large clearance between the inlet cone and the rotor allows gases to recirculate, so the dust passes into the rotor several times.

In such cases, the solution is to use a rotor design with fewer blades and special profiles that minimise the build-up of dust. This newly-designed rotor is then placed in the existing casing and connected to the existing ducts.

### The best match to current operating conditions

Replacing a rotor brings an opportunity to adapt a fan to the actual operating conditions of the plant. These have often changed over the time since the plant was created: filters may have deteriorated, additional environmental protection devices may have been installed or the plant output may simply have increased beyond expectations.

Whatever the cause of the change in conditions, we can provide a cost-effective fan optimisation proposal that will deliver the performance of a brand new fan.

Our specialists will be happy to carry out a thorough analysis and prepare a proposal that retains as much as possible of the existing equipment, so minimising costs, while optimising the performance of the plant.

**We call this approach optimise to economise.**

### Reduced maintenance and longer life

When we develop new rotor designs and protection technologies, we give the highest priority to improving availability and reducing maintenance needs.

The main determinant of fan availability is reliability. Thus, factors like the holding of key spare parts on site, the use of preventive maintenance and the reduction of time spent



Impeller for revamping a cement plant pre-heater ID fan



Cement plant in Algeria

on repairs must all be taken into account when planning an effective maintenance programme. And, just as each fan is tailored to meet the demands and performance of its unique situation, its maintenance programmes should be specifically designed to achieve the highest possible availability throughout its life. Our specialists can advise you about how to keep your fan equipment trouble free.

We offer an extensive range of well-proven erosion and wear protection solutions for fans that operate in corrosive flue gases, high dust and high temperature environments.

These include:

- soft coating with rubber or polyurethane for general corrosion protection.
- direct hard facing coating, ranging from arc welding to high velocity spraying process (HVOC).
- ceramic tile coating of blades.
- wear plates in various types of steel.
- tungsten carbide applied to blade noses for brittle erosion.
- chromium carbide, for structure protection against ductile erosion.

### Financial payback

In every fan revamping projects we have carried out to date for customers within the cement industry, our programme has paid for itself, through improved performance or reduced power consumption, within a maximum of 18 months.

For further information on fan revamping for cement plants please visit [www.howden.com](http://www.howden.com) or contact your local Howden company.