

Howden successfully retrofits fans for Siam Cement Group



Howden were invited to retrofit fans at two of Siam Cement Group's (SCG) plants, Khao Wong an 11.000tpd production line and Thung Song a 3.000tpd production line.

Problem

Siam Cement Group (SCG) is the largest cement group in Thailand and Southeast Asia. Due to local environmental legislation being implemented in order to help reduce emissions, Howden were invited to two of SCG's cements, Khao Wong and Thung Song, to replace their ESP filters with bag filters.

Howden were selected as we were able to provide the best retrofit solution based on performance and price whilst being able to re-use a significant amount of parts throughout the retrofit project.

Solution

SCG decided to split the scope of supply between the filters package and the fans package. With support from the filters supplier, SCG engineers calculated the new operating conditions and generated a new specification for the main filter fans at the two production lines. It was after this point that Howden were appointed to design, engineer and supply the new fans.

Howden experts studied the existing fan's current design, dimensions and operating conditions. These are shown in **Table 1** and **Table 2**.

A comparison of the 'old' and 'new' operating conditions was then conducted in order to determine the most suitable solution. The comparisons can be seen in **Table 3** and **Table 4**.

Table 1: Fan's original design at Khao Wong

Impeller diameter (mm)	3.720
Motor power (KW)	2.700
Rotating speed (RPM)	399

Table 2: Fan's original design at Thung Song

Impeller diameter (mm)	1.880
Motor power (KW)	260
Rotating speed (RPM)	740

Table 3 : Old and new design parameters of Filter Fan Khao Wong

Parameter	Difference
Flow	+ 5.3%
Total pressure	+ 48.5%
Motor power	No (Motor unchanged)
Rotating speed	+161RPM - Installation of a gear box

Table 4: Old and new design parameters of Filter Fan Thung Song

Parameter	Difference
Flow	+ 21.7%
Total pressure	+ 45.5%
Motor power	+ 48.5%
Rotating speed	No



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Solution

At the Khao Wong plant, a solution was selected that could adapt an impeller design fitting into the casing of the existing, main filter fan and would also combine a low power consumption level. This provided the added advantage of keeping some of the existing equipment, such as the motor. The cost of the investment was significantly reduced and the installation time was also limited. Khao Wong's new main filter fan was installed and completed within 10 days.

At Thung Song cement plant, the casing of the main filter fan had to be changed due to the flow and pressure increasing too much in comparison to the existing fan's operating conditions. The new impeller was also too big to fit into the existing casing.

A new solution was then developed by Howden experts that allowed a new fan with a casing that fitted into the existing foundation of the old fan's casing. The main filter fan's replacement was able to be completed in a relatively short period of time as there was no civil work required. The new main filter fan assembly was carried out in 13 days.

Outcome

After the installation of the new fans and new filters was completed, performance tests were conducted by SCG. They were very satisfied with the performance achieved by the fans at both plants. The replacement of the filters and fans has helped minimise the total cost of their fan retrofit with a very customisable design.