

GORE LOW DRAG BAGS FOR OYAK



Above: OYAK Cement's Ünye plant.

With seven integrated plants and three grinding facilities, as well as sales operations in all geographical territories, OYAK Cement is the capacity and market leader in the Turkish cement industry. It is also an innovator, developing areas of cement use in Türkiye – always with the principles of efficiency, creativity and profit-orientation. Accordingly, following previous collaborations with W. L. GORE & Associates, the company decided to install GORE LOW DRAG filter bag technology at its Ünye plant, the first time that the technology has been in Türkiye...

OYAK Cement has several past experiences with GORE filter media, and several applications have been completed, many with highly-demanding specifications. Accordingly, having been informed about the GORE® Low DRAG filter bag technology and after further initial technical discussions, a decision was taken to launch a pilot project to test the concept at OYAK's Ünye Plant – marking the first time GORE Low DRAG filter bags were installed in Türkiye.

True surface filtration

GORE LOW DRAG filter bags are true surface filters made from a uniquely-structured membrane that prevents dust from penetrating the membrane

fibrils. This makes the filter bag very easy to clean and ensures low differential pressure, even over the long term.

The benefits of this high level of performance are widespread. Low differential pressure enables the fan motor to operate at a lower rotational speed, resulting in significant fan energy savings. Increased airflow through the filter bags enables production increases without having to add more filters or expand the bag house. If the filter bags are being used in the kiln baghouse, it is possible to increase the quantity of alternative fuels used, as greater airflow enables optimised combustion.

Plants that cannot make use of the increased airflow could reduce the number of filter bags in the

baghouse. Alternatively, a plant could maintain all of its existing operating parameters and still achieve longer bag life thanks to the improved filtration and cleaning efficiency.

The situation at Ünye

OYAK Cement was already using good quality bags in all of its operations. It was generally happy with their performance. Still, the promised benefits of the GORE LOW DRAG filter bags convinced OYAK to go ahead with the pilot project.

Dramatic results

Going into the project, the Ünye Plant was achieving airflow of 130,000m³/hr with fan power consumption of 120kW/hr. During an annual maintenance outage in April 2021, the team replaced all of the existing filter bags with GORE LOW DRAG filter bags. For the first month of operation, the plant team tested the bags in a range of scenarios: high capacity, low capacity, high energy, low energy, as well as the specific energy consumption per tonne of cement.

Armed with that data, the plant was able to confirm that the new filter bags had enabled a huge increase in air flow to nearly 200,000m³/hr and a dramatic reduction in fan power consumption to 60-65kW/hr. This is attributed entirely to the lower differential pressure, which has dropped from around 15-17mbar to just 8-9mbar. Not only will it lower the plant's fan energy costs, it will also decrease its environmental impact.

In terms of life expectancy, the old filter bags generally had a life of about 1.5-2.5 years. The new GORE LOW DRAG filter bags are expected to last 4-5 years, representing another significant cost saving for the plant. Dust emissions, which were previously around 15-20mgNm³, are now down to less than 5mg/Nm³. Cleaning energy has dropped from 6bar to 3.5-4.0bar, while the cleaning frequency has dropped from every five seconds to every 40 seconds, saving compressed air costs and helping to increase bag life.

Low Total Cost of Ownership

"The GORE LOW DRAG filter bags may seem expensive, but the ROI is incredibly quick," explains Mr Fidan, Director of Performance and Process Department of OYAK Cement. "Within five months the technology had already paid for itself. We have been very impressed with the technology, and with the service provided by Gore."

Thanks to the success of this project, OYAK Cement is planning to roll out the new GORE LOW DRAG filter bags to other processes, including the



Parameter	Before	After	Difference
Differential Pressure (mbar)	15.17	9.1	40% lower
Temperature (C)	62	62	Constant
Pulse Pressure (Bar)	6.03	3.5	42% lower
Pulse frequency (s)	5	40	8 x less frequent
Speed (rpm)	750	600	20% lower
Fan Motor Amplitude (A)	330.7	215	35% lower
Main Damper (%)	95	95	Constant
Production (t/hr)	177	180	+3t/hr



Top: Installing the GORE LOW DRAG filter bags.

Above - Table 1: Operating parameters before and after installation of the GORE LOW DRAG filter bags.

Left: GORE LOW DRAG filter bags offer a range of benefits, including the potential for higher production, greater use of alternative fuels, lower total cost of ownership and lower dust emissions.

Right: Unpacking the GORE Low DRAG filter bags.

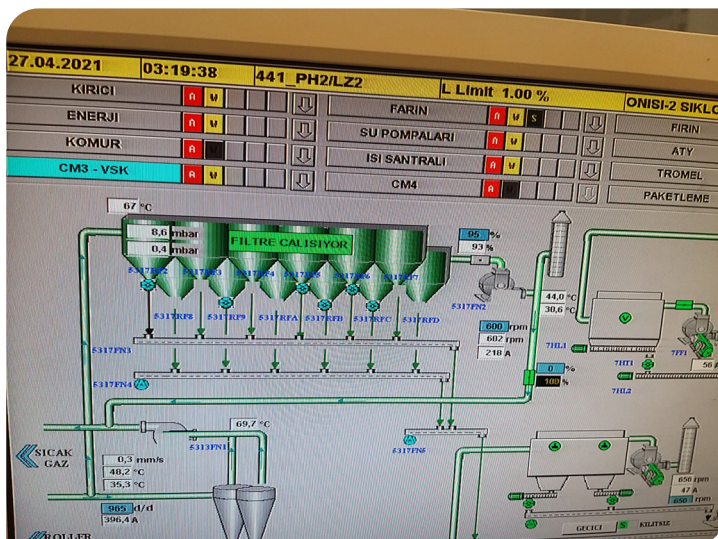


Right: The Ünye plant has seen a wide range of benefits. OYAK Cement is now expanding the use of GORE Low DRAG filter bags across the plant and its global operations.

kiln baghouse, and at other plants in Türkiye and around the world.

“The kiln baghouse will be more challenging because of the high temperatures, but we are very confident in this technology,” adds Mr Fidan. “We expect to be able to burn more alternative fuels as a result of the increased airflow. In terms of rolling out the GORE Low DRAG filter bags to our other facilities – it makes good business sense. We are saving money, reducing emissions and achieving our production goals. Relatively small changes like this can make a big difference to our process, as well as our environmental impact. We have a responsibility to invest in technologies that will reduce CO₂ emissions.”

“Our GORE Low DRAG filter bags offer an opportunity for cement producers in Türkiye and around the world to reduce costs and increase baghouse efficiency,” says Musa Önay, W. L. Gore & Associates. “But projects such as these rely on the close cooperation between plant and supplier. I would like to thank Mr Fidan, Mr Arslan and the team for their trust in us, as well as the Gore team – and especially Melih Akdeniz –



for ensuring the project proceeded smoothly. Even the best technology is only as good as the people behind it.”

OYAK Cement's green commitments

OYAK Cement is committed to minimising its environmental impact. Every year, the company invests in environmental projects at its cement plants, including dedusting, NO_x emission reduction systems, CEM systems, waste water treatment, alternative fuels projects and more.

By investing in the best available technologies, OYAK Cement is able to continually reduce emissions while increasing health and

safety. Furthermore, the company is investing in green cement with a greenfield calcined clay plant in the Ivory Coast, another underway in Cameroon and more to be announced in 2022.

The company is committed to reducing clinker content to help decarbonise the cement industry. OYAK Cement has plans to try GORE Low DRAG filter bags at its calcined clay manufacturing stages.