



GORE® Filtration Products

METALS INDUSTRY

Case history: Steel Plant, Virginia, USA

GORE® LOW DRAG™ Filter Bags: Decrease energy costs while increasing plant performance

CHALLENGE

Energy costs can greatly impact profitability in the steel industry. In Virginia, a steel plant had a 60-year tradition of producing high-quality products at the lowest possible cost while operating in an environmentally responsible way. To control pollution in the meltshop, the plant had installed 3,600 non-membrane woven polyester filter bags to filter gases drawn from the electric arc furnace (EAF), with three fans, each with its damper open 60%, drawing the gases through the ventilation system. The fans were costly to operate each day, and the plant hoped to optimize them to reduce costs. With the existing filter bags reaching the end of their product life, the plant saw filtration as an area where improvement could start a chain reaction of energy efficiency and savings in the APC system.

SOLUTION

The plant selected GORE® LOW DRAG™ Filter Bags, and Gore installed 3,600 bags to replace the previous bags with no additional changes needed. The plant selected the membrane-based, fiberglass GORE LOW DRAG Filter Bags because they significantly lower drag, resulting in less dust cake buildup after cleaning and 10–15% greater airflow through the baghouse. Immediately upon startup after the GORE LOW DRAG Filter Bags were installed, the filter drag decreased from 2.8" w.g./fpm to 2.0" w.g./fpm, and the baghouse dP decreased from 9.5–10.5" w.g. to 4" w.g. With this lower filter resistance, the fan volume potential for each fan was increased.

RESULT

Three weeks after installing the new GORE LOW DRAG Filter Bags, the plant decided to turn off one fan, with each of the two remaining fans' dampers adjusted to 100% to allow airflow sufficient to evacuate the meltshop. With this change, the plant now saves over \$400,000 per year on electricity by using less energy overall, while also allowing for easier maintenance on the idled fan. Additionally, even with only two fans the total system volume has increased from 930,000 to 950,000 ACFM; and the consistently low pressure drop has made flow rates more consistent, leading to better draft control in the EAF.



DATA BOX

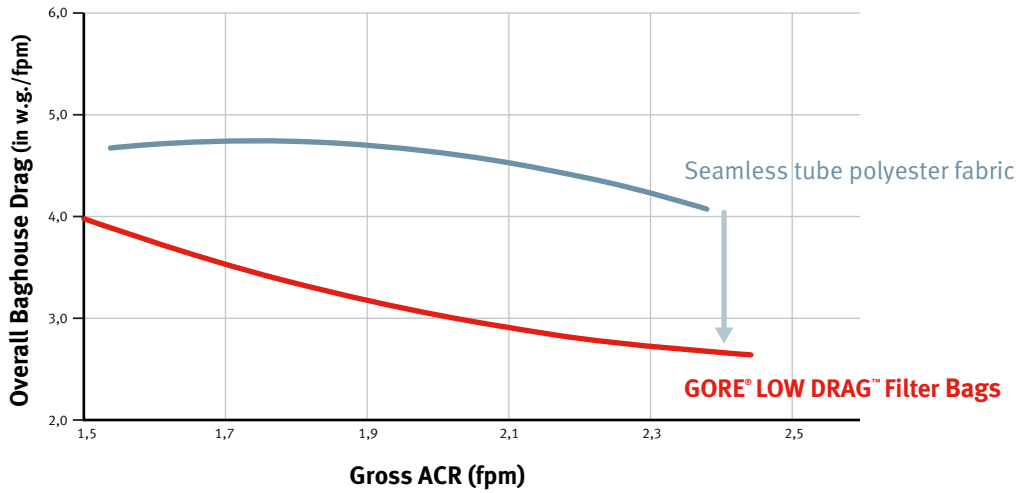
Application	Steel plant, EAF, reverse air baghouse, 2 main fans in operation (plus one off)
Gas flow rate	950,000 ACFM
Operating temperature	165 °F
Total filter area	3,600 filter bags
Emissions rate	less than 0.00044 grains/dscf
Differential pressure	Baghouse dP decreased from 9.5–10.5" to 4" (in w.g)
Filter drag	Decreased from 2.8" to 2.0" w.g./fpm
Bag life	Expected to be greater than 6 years
Filter material	GORE® LOW DRAG™ Filter Bags (10 oz/yd ² fiberglass)

With the greater airflow enabling greater fan performance, the plant is now investigating new high-efficiency fan wheels to further improve energy use and draft control. As an unexpected result, the filter bags' improved dust cake release has allowed for improved capture of particulates in the PM10 and PM2.5 size ranges — the lowest emissions results this long-running steel plant has ever achieved.



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GORE® LOW DRAG™ Filter Bags significantly reduced overall filter drag



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