



GORE® Filtration Products

Metals Industry

Case History 11

Electric Arc Furnace

OPTIMIZATION POTENTIAL

System limitations forced the plant to reduce the secondary emission system flow in an attempt to maintain enough primary evacuation. Even with reduced secondary draft, the pressure drop across a radiant/convective (U Tube) cooler in the Direct Evacuation Control (DEC) system contributed to inadequate primary flow. The baghouse inlet temperature often reached the polyester temperature limit, requiring reduced primary evacuation that led to furnace fugitive emissions and problems for the furnace roof.

The diminished secondary flow limited the system's ability to maintain a clean melt shop atmosphere. Ladle furnace ventilation was poor and emissions from the ladle furnace hoods added to the dust load in the building.

SOLUTION

Replaced the existing polyester bags with GORE® membrane filter bags with fiberglass backing material and optimized system flow settings.

Since the GORE® membrane filter bags are not subject to hydrolysis the plant added "peak shaver" water sprays at the end of the water cooled duct and removed the U Tube cooler. A booster fan was added to improve ladle furnace fume capture.

RESULT

By removing the U Tube cooler pressure loss the plant was able to open the canopy hood dampers more. This allowed increased secondary flow from the shop. With less flow resistance through the DEC system the primary evacuation has also increased with better fume capture at the furnace. The maximum baghouse inlet temperature now reaches about 170°C (340°F) without concern for damaging the bags.



Application:	Steel Electric Arc Furnace
Baghouse:	Reverse Air Cleaning 3,400,000 Am ³ /h (2,000,000 acfm)
Number of bags:	6912
Filter area:	66,400 m ² (712,400 ft ²)
Temperature:	170°C (340°F) maximum
Filter material:	GORE® membrane filter bag with 339 g/m ² (10 oz./ yd ²) acid resistant fiberglass backing material

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