

# MIDWESCO CASE HISTORIES

## Using Pleated Technology to meet MACT compliance and extend service life.

**PROBLEM:** In 1996 a primary aluminum plant located in the Midwest purchased over 20,000 pleated elements from another supplier to replace conventional polyester felt bags. Four primary objectives had to be met in order to consider the investment of the more costly pleated filters a success. The first objective was to reduce total particulate and hydrogen fluoride levels (by 64%) to meet proposed emission requirements of new MACT standards for pot-line ventilation. The second objective was to eliminate air flow bottle necks and increase air flow by 20% using pleated technology. The third objective was to save energy costs through decreased electric and compressed air consumption. The fourth objective was to attain a minimum of four years service life with pleated technology.

Though the initial tests and trials met the first three objectives, the final objective of service life was not met due to poor bag life. The pleated filters were fabricated with



a polyurethane top and bottom pieces. After less than a year of service the plant began experiencing increased emissions. The problem stemmed from fluoride attacking the polyurethane causing the elements to abrade and eventually fall from the baghouse structure, which caused emissions, and unexpected maintenance costs of removing failed filters. Due to continuous failures none of the four objectives were met due to the durability issue, and a plan to return to less efficient conventional felt bags was being considered.

**SOLUTION:** Though the initial effort with pleated elements was a failure due to the construction problems causing low service life, the pot-line operators were still excited about the possibility for increased air flows and lower emission requirements that pleated elements had the potential for. Midwesco was invited to look at the problem and determine if there was a manner of creating a pleated element construction that would meet all four objections. Through experiences with other pot-line smelters Midwesco had already created a design that could handle the fluoride gases and extend service life. The design is an all metal design called SEAL-TITE™, which does not use polyurethane for any part of the construction. The SEAL-TITE™ construction utilizes the same spun bond polyester pleated technology in order to meet the

environmental, process and energy savings that pleated filters offer. The difference is that the SEAL-TITE™ design is more durable and will last longer than other suppliers pleated filter constructions.



In the winter of 2001, Midwesco installed one reactor of SEAL-TITE™ pleated filters. After 13 months of service the SEAL-TITE™ filters have met all environmental, flow, and energy-savings objectives without a single failure. As a result, in the winter of 2003 the plant purchased 12,000 additional SEAL-TITE™ filters for the pot-line reactors.

**midwesco**  
Filter Resources, Inc.

P.O. Box 2075  
Winchester, Virginia 22604  
(540) 667-8500  
FAX (540) 667-9074  
Toll Free 1-800-336-7300

[www.midwescofilter.com](http://www.midwescofilter.com)

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