

P5 PLEATED FILTER ELEMENTS DELIVERING RELIABILITY AND BETTER MERCURY CONTROL TO COAL-FIRED POWER PLANTS

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Pleated filter elements with ePTFE membrane provide an improved alternate to the traditional round filter bag technology. Such pleated filter elements result in lower installation costs and lower operating costs. In most cases, a 9-meter long traditional round filter bag can be replaced with a 2-meter long pleated filter element, and still provide higher cloth area. This results in a lower operating differential pressure, requires lower pulse cleaning pressure, and provides a substantial enhancement in life owing to reduced bag-to-bag abrasion.

In addition to the installation and life cycle cost advantages, a surprising benefit of the pleated filter elements for coal-fired power plants has been seen in controlling the Mercury emissions.

The presentation will review two case studies of coal-fired power plant operations, and the benefits seen from the pleated elements. The first case study shows substantial improvements in Mercury capture with pleated filter elements. Data will be presented that shows that by using novel filtration elements, Mercury capture as high as 98% can be achieved by inherent fly ash alone (without needing to inject powdered activated carbon). This was true in spite of majority (about 80%) of Mercury being in elemental form in the flue gas. Traditional round filter bags are typically known to capture significantly lower percentage of Mercury in the flue gas by inherent fly ash. Data was also collected with injection of activated carbon upstream of baghouse. It was found that by using these novel filtration elements, if a plant is already using powdered activated carbon the consumption of activated carbon can be reduced by as much as 85%. Data will be reviewed along with the proposal of mechanisms about how this novel filtration element works in achieving such high Mercury captures, as compared to traditional round bags.

The second case study shows a dramatic improvement in reliability, operating costs, and life on switching from traditional long bags to pleated filter elements.