

Baghouse (or Fabric Filter)



The Problem-

Just like the wood in your fireplace at home, when coal is burned it leaves behind a dust known as ash. Roughly 75 percent of the ash remaining from the combustion of coal is suspended in the exhaust gases and would be emitted into the atmosphere.

The Solution -

A fabric material can be used to filter the solid particles from the exhaust gases, similar to the way a coffee filter separates the coffee from the grounds.

How it works-

The baghouse is a large industrial version of a home vacuum cleaner. The vacuum cleaner uses a paper bag where air is sucked from the carpet and carries the dirt in the carpet to the bag. The dirty air goes inside the bag and the paper material lets the air escape through the bag, leaving the dust inside. In power plants, the same principle can be used, but the bags are made of a specialized polymer material, and the dust normally is collected on the outside of the bag – so they can be mechanically cleaned. In a power plant baghouse, there are normally thousands of bags, about six inches around and anywhere from 20 to 35 feet long.

What does this have to do with mercury control?

Just like electrostatic precipitators (ESPs), the baghouse can be used to collect mercury by using sorbents – solid materials that can absorb mercury. These solid materials are ground very finely, like baking flour, and then added to the exhaust gases before the baghouse or ESP. The ash collection device collects both the ash and the sorbent together. Although activated carbon is the most widely tested sorbent, there are many other promising materials that have been proposed to be used to capture and remove the mercury from the exhaust gases. Sorbents in baghouses have an advantage over their use in ESPs, because the dust layer stays on the bag for several minutes, and thus allowing the sorbent material to contact a lot of exhaust gas passing through.