

2007 DOE/NETL Mercury Program Review

Sorbents for Mercury Control:
Quality, Specifications, Best Choice,
Availability, & Cost

December 11, 2007

Quality – What Matters?

Adsorptive Character

- Pore Volume
- Pore Size
- Surface Chemistry

Particle size

Density/Particle Count

Volatile Content

Impregnates



Quality – What Matters?

Adsorptive Tests to Characterize Activated Carbon

- BET (N₂) Surface Area/Iodine Number
- Molasses
- Methylene Blue, BWC, Tannin Number, Phenol Number & others

These tests can reflect to what degree a particular activated carbon has been activated, but not how well it will remove mercury. Additionally, the base carbon dictates which index is meaningful to a given process.

Different Carbon Base = Different Test.

Quality – What Matters?

Adsorptive Tests to Characterize Activated Carbon

- Hg Loading Capacity and Kinetics
 - Norit Americas has developed a Hg adsorption test in order to begin specifying its flue gas mercury removal products on a new CEM-based lot analysis, ensuring that every lot of carbon meets expected mercury removal requirements.

Quality – What Matters?

Particle Size/Density/Particle Count

- In all but baghouse applications, a collision must take place for mercury removal to occur.
- Finer product with lower density increases particle count and thus the probability of a collision

Volatile Content

- There are a number of carbonaceous sorbents with high (>8%) volatile content which lowers the ignition point and increases the risk of self-heating. Fully activated PAC produced in the USA have low volatile content.

Quality – What Matters?

Impregnates

- Depending on site-specific requirements, a variety of select impregnates or additives can be processed with the activated carbon to meet varying needs.
 - Low Rank Fuels (DARCO Hg-LH)
 - Concrete Compatible (DARCO Hg-CC)
 - Improved Efficiency in moderate SO₃ flue gas
 - Others in development

Norit PAC Availability

- Norit is the largest PAC producer both domestically and globally. Total capacity of more than 140 Million pounds in the US alone, between Marshall, TX and Pryor, OK.
- Norit European production was expanded in 2007 to increase global supply.
- We announced a major expansion at the Marshall, TX facility to be operational at the beginning of 2009. Equipment is on order and site-work is underway.
- Future expansions are modular in design, requiring 12 – 14 months and will be added as customer demand/contracts dictate.

No following. Norit. Just leading.



Activated Carbon |