What Is Mercury & Why Should We Remove It From Our Stacks?

- Liquid Metal
- 113 Pounds/gallon
- Neurotoxin (The Mad Hatter)
- Dimethylmercury – Cancer in mice

Where Does Hg Originate?

- Cinnabar, HgS
- Largest emission is from coal fired power plants
- $HgS + O_2 >> SO_{2(g)} + Hg_{(g)}$
- $O_2 + Hg_{(g)} >> + HgO_{(g)}$
- From Sludge

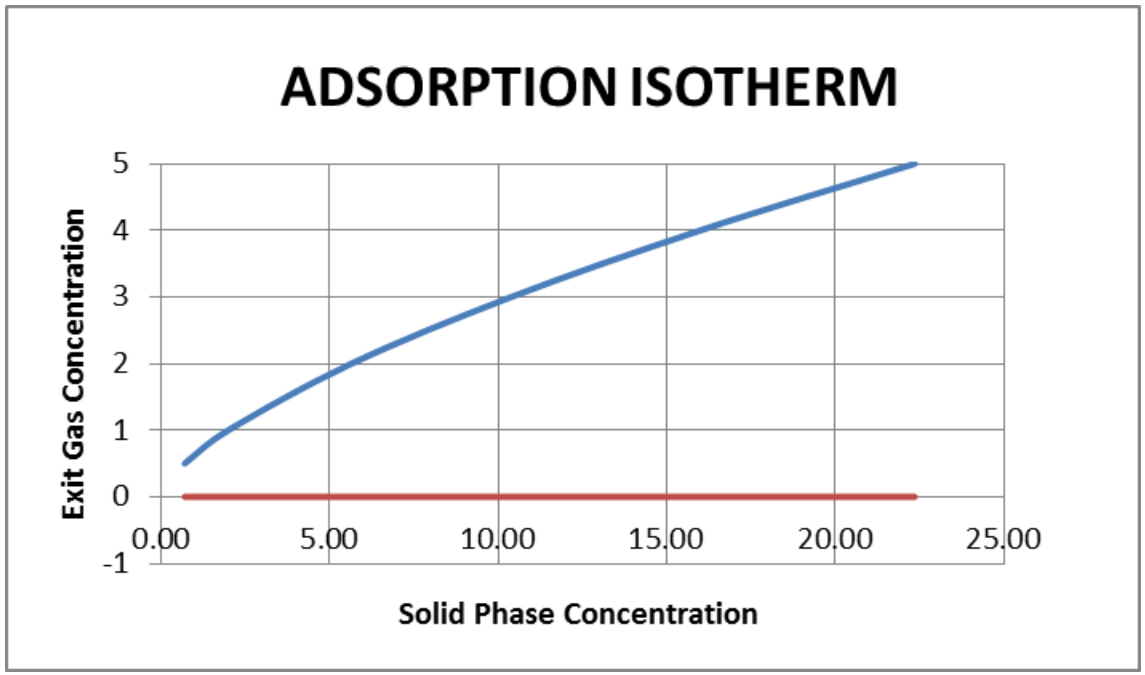
New Federal Limits

Effective March 21, 2016

NEW Hg EMISSIONS LIMITS		
	Exhisting	**New**
Fluid Beds	0.037	0.0010
Multiple Hearths	0.28	0.0010
Units	mg/dscm @ 7% O_2	

How Do We Capture Hg?

- A**d**sorption (film on your windshield)
- Similar to Activated Carbon (AC) filled odor scrubbers. But with chemical reaction.



Unit Operations

- 1. Remove the heat
- 2. Remove the large particulate
- 3. Remove water droplets
- 4. Heat to >20°F above the dew point
- 5. Remove ultra-fine particles
- 6. Adsorb the Hg on Activated Carbon

1. Remove The Heat

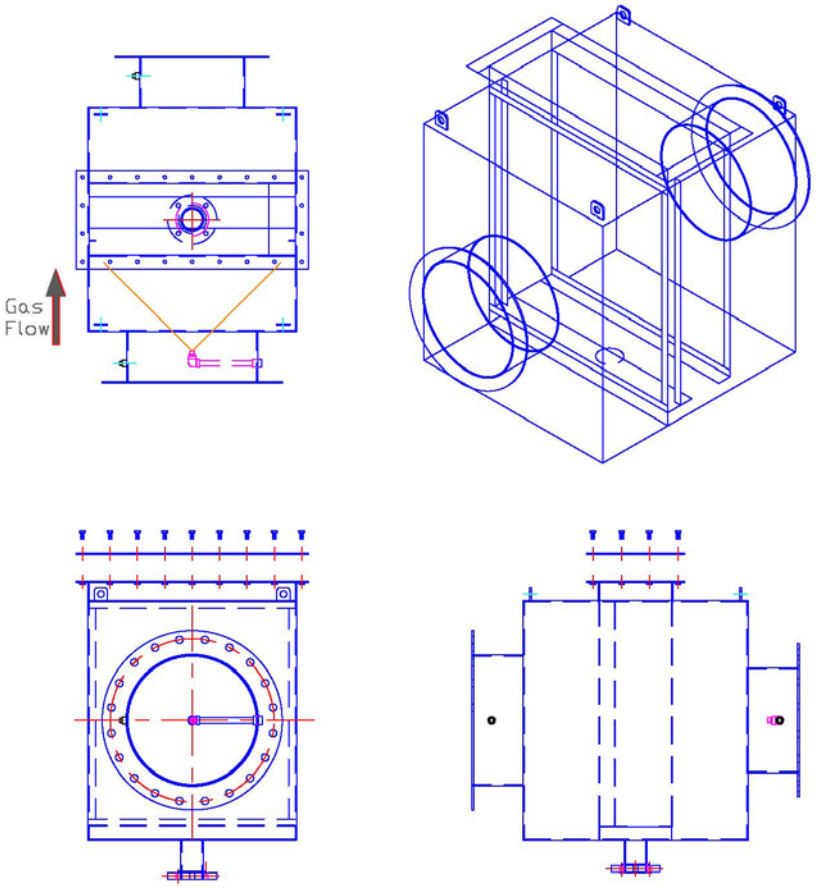
- Here in NJ every location uses a wet scrubber.
  - Venturi scrubber
  - Tray scrubber
  - VenturiPAK scrubber
  - Ring Jet scrubber
  - Packed bed scrubber
- The result is a saturated gas at 80°F - 100°F.

2. Remove The Large Particulate

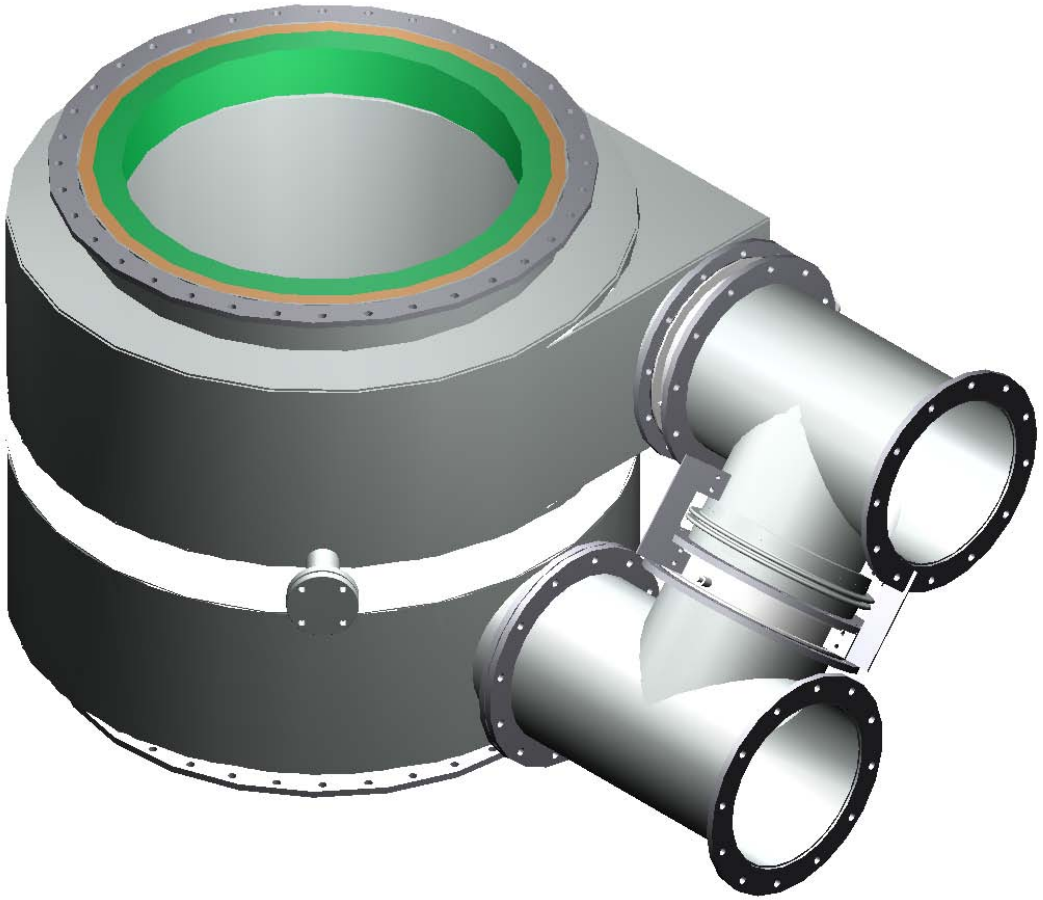
- This is most often done in the wet scrubber system.
- Frequently, a Wet Electrostatic Precipitator (WESP) is added following the scrubber.

3. Remove Water Droplets

- Coalescer-Demister



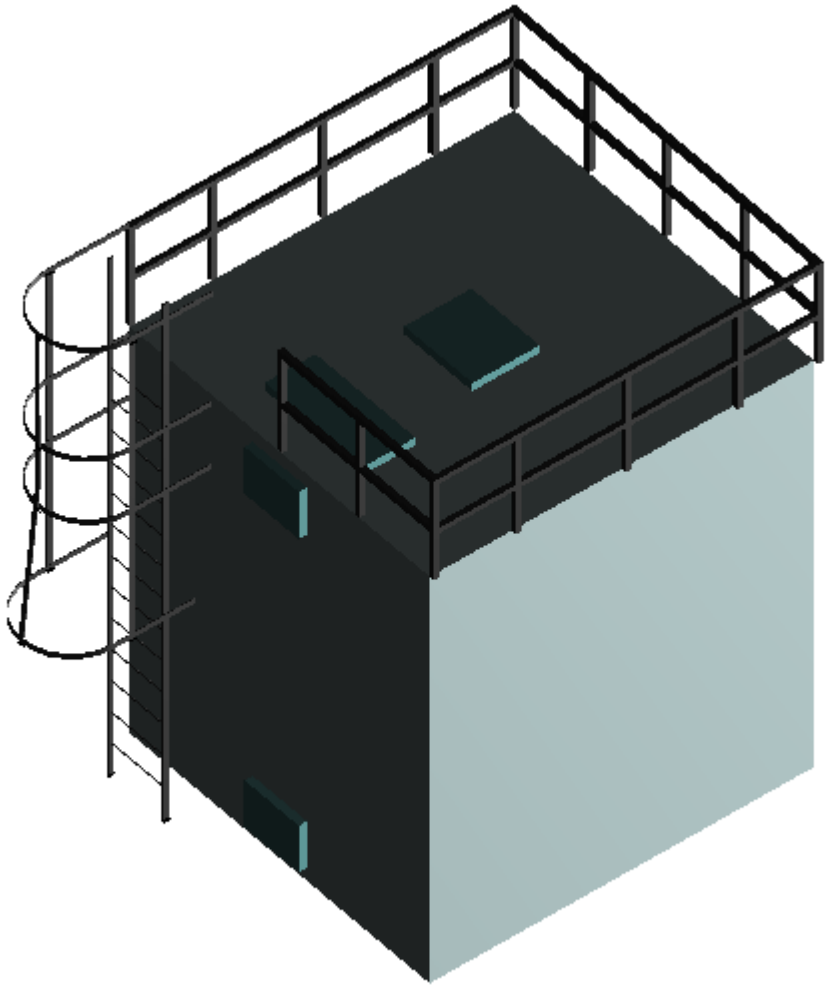
4. Heat The Gas

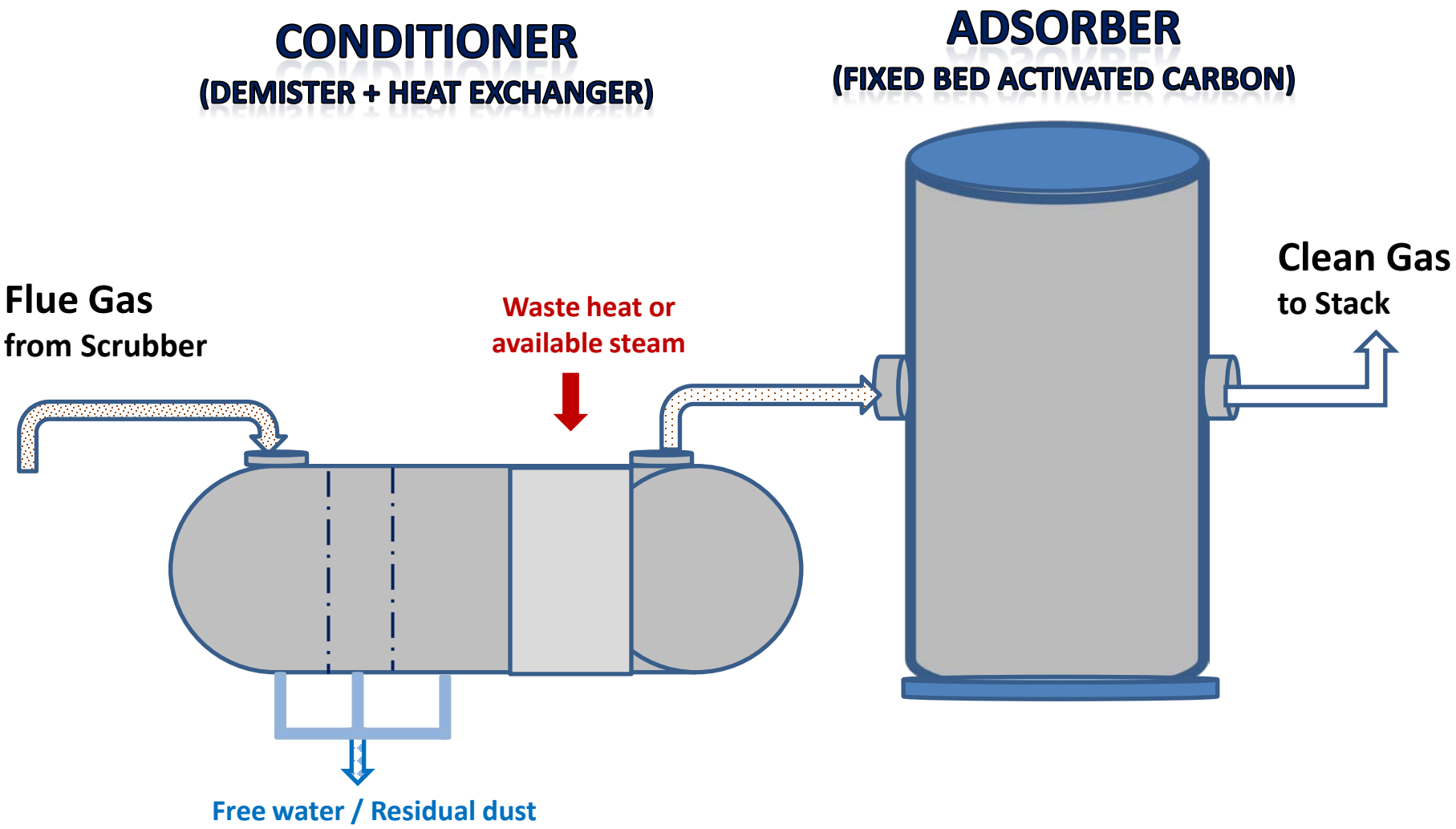


5. Remove Ultra-Fine Particles

- Ultra-High Efficiency Filter

6. Adsorb the Hg




CONDITIONER
(DEMISTER + HEAT EXCHANGER)
ADSORBER
(FIXED BED ACTIVATED CARBON)
Flue Gas
from Scrubber
Waste heat or
available steam
Clean Gas
to Stack
Free water / Residual dust

Pretreatment In One Container