

Industrial Boiler and Process Heater MACT

McIlvaine Hot Topic Hour
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What is a “MACT”?

- “Maximum Achievable Control Technology”
- Describes the level of control adopted to implement a National Emissions Standard for Hazardous Air Pollutants (NESHAP)
- Section 112 of the Clean Air Act (Title III) establishes the MACT program, and includes:
 - a list of ~189 hazardous air pollutants (HAPs),
 - requirement that EPA prepare a list of HAP source categories and adopt a MACT for each source category
 - case-by-case MACT requirements



What is a MACT?

MACT is:

- “the **maximum degree** of reduction in [HAPs],” ...
- “taking into consideration
 - the **cost** of achieving such emission reduction,
 - any non-air quality health and environmental impacts and energy requirements,”
- that the Administrator “determines is **achievable** ...”

The MACT “**floor**” is deemed **achievable**:

EXISTING: “the average emission limitation achieved by the best performing 12 percent of existing sources”

NEW: the emission limit achieved by the best controlled “similar” source



Historical Perspective

- EPA adopted Subpart DDDDD in 2005, along with a rule to separate industrial boilers from waste incinerators (CISWI definitions rule)
- Divided industrial boilers from CISWIs based on energy recovery
- D.C. Circuit vacated both rules in June 2007
- The Court held that any facility combusting “any solid waste” at all must be regulated as an incinerator (under Section 129) instead of a HAP source (under Section 112)

Historical Perspective

Subpart DDDDD	New	Existing
Carbon Monoxide (CO)	400 ppm (~0.45)	None
Particulate Matter (PM)	0.025	0.07
Hydrogen Chloride (HCl)	0.02	0.09
Mercury (Hg)	3.0e-6	None
Dioxins/Furans (D/F)	None	None

Limits in lb/mmBtu, unless noted otherwise

Biomass Emission limits only



Current Proposal

- Published June 4, 2010 (75 Fed. Reg. 32006)
- Applies to 13,500 units (~ 11,500 natural gas)
- Subcategorized stokers and fluidized beds
- Increased stringency and addition of new limits not found in the previous MACT rule
- Final rule promised by December 2010, but EPA has delayed release of the final rule until January 2011
- Requires compliance by all new sources upon startup and by all existing sources within 3 years of final rule

Current Proposal

Subpart DDDDD	New	Existing
Carbon Monoxide (CO)	560 / 40 ppm	560 / 250 ppm
Particulate Matter (PM)	0.008	0.02
Hydrogen Chloride (HCl)	0.004	0.006
Mercury (Hg)	9.0e-7	2.0e-7
Dioxins/Furans (D/F)	0.00005 / 0.007 ng/m ³	0.004 / 0.02 ng/m ³

Biomass emissions only, multiple limits listed for Stoker / Fluidized Bed

Limits in lb/mmBtu, unless noted otherwise



Increased Stringency for Biomass

Carbon Monoxide:

- *less* stringent for new stokers (400 → 560 ppm)
- *more* stringent for new FBs (400 → 40 ppm)
- *more* stringent – establishes new limit for existing units

Particulate Matter:

- *more* stringent for new units (0.025 → 0.008)
- *more* stringent for existing units (0.07 → 0.02)

Hydrogen Chloride:

- *more* stringent – order of magnitude lower for both new units (0.02 → 0.004) and existing units (0.09 → 0.006)

Mercury:

- *more* stringent – order of magnitude lower for new units ($3.0e^{-6}$ → $9.0e^{-7}$) and establishes new limit for existing units

Dioxins & Furans:

- *more* stringent – establishes a new limit for new and existing sources



Increased Stringency for Biomass

Available Controls:

Carbon Monoxide: good combustion, CO catalyst, CO CEMS

Particulate Matter: baghouse, scrubber, wet ESP, PM CEMS

Hydrogen Chloride: scrubber, sorbent injection

Mercury: activated carbon injection, baghouse, scrubber

Dioxins & Furans: ?

**Sources must do whatever necessary to
comply, just installing additional
controls will not suffice!**



Potential Problems

- “best performing 12 percent [or] best performing 5 sources [in] categories with fewer than 30 sources”
- Appropriate surrogates? (e.g., CO for organic HAPs?)
- Startup, shutdown, malfunction emissions
- “Franken-plant” phenomenon



Other Related Rules

In addition to the MACT proposal, EPA issued three other related rules:

1. Area Source Industrial Boiler MACT
2. CISWI MACT Proposal
3. “Solid Waste” Definition



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