

BOILER MACT
40 CFR 63 DDDDD

I. Applicability (63.7485):

Industrial, commercial, or institutional boiler or process heater (63.7575) located at a HAP major, except for (63.7491) exempted listed below.

Note: Major source of HAP from oil and gas production is defined in 63.761 (Subpart HH).

II. Exemptions (63.7491):

- a) Electric utility steam generating unit;
- b) Recovery boiler or furnace covered by Subpart MM;
- c) R & D units;
- d) Hot water heaters;
- e) Refining kettle covered by Subpart X;
- f) Ethylene cracking furnace covered by Subpart YY;
- g) Blast stoves (see 63.14);
- h) Units subject to another NESHAP;
- i) Control devices used to comply with another NESHAP, provided $\geq 50\%$ of the heat input is gases from the NESHAP controlled source;
- j) Temporary boilers;
- k) Blast furnace gas fuel fired units;
- l) Boilers listed as an affected source in standards under Section 129 of CAA (Solid waste incineration); and
- m) Boilers regulated under Section 3005 of Solid Waste Disposal Act or covered by Subpart EEE (hazardous waste boilers).

III. Compliance Date (63.7495):

Existing sources have three (3) years from *Federal Register* publication to achieve compliance.

New or reconstructed units after June 4, 2010 must comply upon startup, or within 60 days of *Federal Register* publication date.

Existing boilers at a source that becomes a major source have three (3) years after becoming a major source.

New boilers at a source that becomes a major source must be in compliance at startup.

Solid waste incineration units which cease combusting solid waste must comply upon the switch from waste to fuel.

Emission Limits and Work Practice Standards

Boilers and process heaters are divided into 15 subcategories based on fuel design:

- For fuel-based pollutants - HAP metals (PM), HCl and Hg are regulated
- The unit is subject to "solids" limits if $\geq 10\%$ fuel is solid (annual basis)
- The unit is subject to "liquids" limits if $\geq 10\%$ fuel is liquid (annual basis)
- There is a "Gas 2" category of limits for non-natural or refinery equivalent fuel
- Unit is biomass if $\geq 10\%$ annual heat input
- Unit is coal-based if $\geq 10\%$ coal (annual) and $\leq 10\%$ biomass
- For natural gas only - annual tune-up instead of limits

IV. Emission Limitations, Work Practice Standards and Operating Limits (63.7500):

Regulated pollutants are

HCl
PM (surrogate for HAP metals)
CO (surrogate for organic HAP)
Hg
Dioxin/Furans

- a.) Table 1 emission limits apply to new or reconstructed units >10.0 MMBtu/hr.
- b.) Table 2 emission limits apply to existing units >10.0 MMBtu/hr.
- c.) Table 3 contains work practice standards:
 - 1.) Biennial tune-up for boilers <10.0 MMBtu/hr., or limited use boilers with enforceable operating limits ≤ 876 hours per year.
 - 2.) Annual tune-up for boilers in Gas 1 or metal process furnace subcategory >10.0 MMBtu/hr.

- 3.) One-time energy assessment by qualified assessor for boilers at major source facilities.
 - 4.) Units subject to Tables 1 or 2 must minimize startup/shutdown periods by following manufacturer's recommended procedures
- d.) Table 4 contains operating limits for demonstrating compliance based on control equipment or operating parameters which are established based upon three one-hour tests. Lowest or highest average for each parameter during those tests establish site-specific operating limits.

Scrubbers for PM - Pressure drop and liquid flow rate (lowest hourly average)

Scrubbers for HCl - pH and flow rate of sorbent (lowest hourly average)

Sorbent Injection - Sorbent injection rate HCl activated carbon for Hg (lowest hourly average)

Fabric Filters for PM

Bag leak detection

Alarm $\leq 5\%$ of any six month period or CEMS

ESPs for PM - Secondary voltage and current (lowest average total secondary power measured)

Fuel Analysis for Hg - Hg content of fuel (becomes max)

Fuel Analysis for HCl - Cl content of fuel (becomes max)

CO and Dioxin/Furan Limits - Measure O₂ in flue gas (lowest average)

Energy Assessment Required for All

V. General Compliance Requirements (63.7505)

- Emission limits and operating limits
- Performance testing, fuel analyses or CMS requirements.

Testing, Fuel Analyses and Initial Compliance Requirements

VI. Initial / Ongoing Compliance Requirements (63.7510 & 63.7515)

- You must demonstrate compliance with emission limits using performance testing, fuel analysis, or continuous emission monitoring systems (CEMS)
- For demonstrating compliance with Table 1 or Table 2 emission limits through performance testing you must:

Perform initial and annual stack testing see (63.7515 & 63.7520) and Table 5

Dioxin/furan only as an initial stack test

Conduct fuel analysis for each fuel see (63.7521) and Table 6

Establish Operating limits see (63.7530) Table 7

Conduct CMS performance evaluations (63.7525)

Develop a site specific stack test plan

Conduct three separate test runs for each performance test

Note: there are qualifiers for less frequent periodic testing

- For demonstrating compliance with Table 1 or Table 2 emissions limits for Hg or HCl through fuel analysis, you must:

Conduct a monthly fuel analysis for each fuel (see 63.7521) and Table 6

A new fuel will require an analysis prior to burning the fuel

Develop (and submit to the Administrator) a site-specific fuel analysis plan which must be submitted no later than 60 days before initial compliance demonstration.

Establish Operating limits see (63.7530) Table 8

- For demonstrating compliance with CO, you must

Conduct CO performance test per Table 5

Conduct evaluation of continuous oxygen monitor (63.7525(a))

VII. Emissions Averaging (63.7522)

Emission averaging is acceptable for 63.7500 requirements if there are more than one boiler/heater, but emission averages must be <90% of the total emission limits (PM, HCl, or Hg)

VIII. Monitoring, Installation, Operation, Maintenance (63.7525)

- a) If subject to a Table 1, 2 or 12 CO emission limit, you must install, operate and maintain a continuous oxygen monitor and must conduct performance evaluation for each oxygen CEMS;
- b) Boiler >250 MMBtu/hr. that combusts coal, biomass or residual oils, you must install, certify and maintain PM CEMS and must conduct a performance evaluation; and
- c) Units subject to an opacity limit and not otherwise required to install and operate a PM CEMS or a bag leak detection system you must install, operate, certify and maintain each CEMS required.

IX. Emission Credits from Early Energy Conservation Measures (how to use steam output limits) (63.7533)

- Requires implementation plan
- Determine actual annual fuel heat input (trillion Btu/year heat input), one-year period
- Inventory fuel purchases and fuel generated on-site
- Document all energy uses
- No credits for shutdown boilers
- Credits are the difference between the benchmark for each boiler and actual energy demand reductions from energy conservation measures
- Develop and submit implementation plan for approval at least 180 days before the rule compliance date

X. Continuous Compliance (63.7540)

Multiple parameters - demonstrated by following requirements under Table 8

XI. Notifications (63.7545 & 63.7(b)&(c), 63.8(e), (f) 4 & 6, 63.9 (b)-(h))

- Initial startup notification
- Intent to conduct performance test
- Notification of compliance status
- Notification of alternative fuel
- Notification of fuel switch

XII. Reports (63.7550)

Semi-annually, annually, or biannually as specified in 63.7550(b)

XIII. Recordkeeping (63.7555 & 63.7560)

Copy of all notifications submitted

Performance tests, fuel analyses or other compliance demonstrations

CEMS and COMS data

Records required under Table 8

Keep records for five years

63.7575 **Important Definitions**

Biomass: Solid fuel that is not a solid waste (wood residue, wood products, animal manure including litter or bedding material, and agricultural residues).

Temporary Boiler: Must be designed to be moveable (using wheels, skids, trailers, platforms, etc.). No foundation. Twelve month limit per position. If seasonal use, must not operate more than three months per year, over two years. Changing position to avoid the rule for the same use is no longer a temporary unit.

Attached next is a Summary of General Emission Standards Contained in:

- a) This New Boiler Rule:
- b) The June 4, 2010 Proposed Rule; and
- c) The Court Vacated 2004 Rule.

BOILER MACT STANDARDS SURVEY

There are three charts attached:

- 1) Final Limits in March 2011 Rule (summary)
- 2) Standards Proposed June 4, 2010
- 3) Previous 2004 Standards (overturned by courts as not MACT levels)

FINAL DDDDD LIMITS (FEB, 2011)

(POUNDS PER MILLION BTUs)

Subcategory	PM	HCl	Hg	Dioxins & Furans	CO Ppmv
Existing Solid Fuel (All)	0.039	0.035	0.0000046		
Existing Pulverized Coal				0.004	160
Existing Stokers Coal/Solid				0.003	270
Existing Fluidized Bed Coal/Solid				0.002	82
Existing Stokers Biomass				0.005	490
Existing Fluidized Bed Biomass				0.02	430
Existing Suspension Biomass/Solid				0.2	470
Existing Fuel Cell Biomass/Solid				4.0	690
Existing Hybrid Suspension/Grate Biomass				0.2	3500
Existing Liquid Fuel	0.0075	0.00033	0.0000035	4.0	10
Existing Gas 2	0.043	0.0017	0.000013	0.08	9
New Solid Fuel (All)	0.0011	0.0022	0.0000035		
New Pulverized Coal				0.003	12
New Stokers Coal/Solid				0.003	6
New Fluidized Bed Coal/Solid				0.002	18
New Stokers Biomass				0.005	160
New Fluidized Bed Biomass				0.02	260
New Suspension				0.2	470
New Fuel Cells Biomass				0.003	470
New Hybrid Suspension/Grate Biomass				0.2	1500
New Liquid Fuel	0.0013	0.0032	0.00000021	0.002	3
New Gas 2	0.0067	0.0017	0.0000079	0.08	3

potential to emit considering controls 10 tons per year or more of any HAP or 25 tons per year or more of any combination of HAP.

D. What emission limitations and work practice standards must I meet?

We are proposing the emission limits presented in Table 1 of this preamble. Emission limits were developed for new and existing sources for eleven subcategories, which we developed based on unit design.

We are proposing that if your new or existing boiler or process heater burns at least 10 percent coal on an annual average heat input² basis, the unit is in one of the coal subcategories. If your new or existing boiler or process heater burns at least 10 percent biomass, on an annual average heat input basis, and less than 10 percent coal, on an annual average heat input basis, we are proposing that the unit is in one of the biomass subcategories. If your new or

existing boiler or process heater burns at least 10 percent liquid fuel (such as distillate oil, residual oil), and less than 10 percent solid fuel, on an annual heat input basis, we are proposing that the unit is in the liquid subcategory. If your new or existing boiler or process heater burns gaseous fuel and less than 10 percent, on an annual average heat input basis, of liquid or solid fuel, we are proposing that the unit is in one of the gas subcategories.

TABLE 1—EMISSION LIMITS FOR BOILERS AND PROCESS HEATERS
(Pounds per million British thermal units)

Subcategory	Particulate matter (PM)	Hydrogen chloride (HCl)	Mercury (Hg)	Carbon monoxide (CO) (ppm @3% oxygen)	Dioxins/furans (total TEQ) (ng/dscm)
Existing—Coal Stoker	0.02	0.02	0.000003	50	0.003
Existing—Coal Fluidized Bed	0.02	0.02	0.000003	30	0.002
Existing—Pulverized Coal	0.02	0.02	0.000003	90	0.004
Existing—Biomass Stoker	0.02	0.006	0.0000009	560	0.004
Existing—Biomass Fluidized Bed	0.02	0.006	0.0000009	250	0.02
Existing—Biomass Suspension Burner/Dutch Oven	0.02	0.006	0.0000009	1010	0.03
Existing—Biomass Fuel Cells	0.02	0.006	0.0000009	270	0.02
Existing—Liquid	0.004	0.0009	0.000004	1	0.002
Existing—Gas (Other Process Gases)	0.05	0.000003	0.0000002	1	0.009
New—Coal Stoker	0.001	0.00006	0.000002	7	0.003
New—Coal Fluidized Bed	0.001	0.00006	0.000002	30	0.00003
New—Pulverized Coal	0.001	0.00006	0.000002	90	0.002
New—Biomass Stoker	0.008	0.004	0.0000002	560	0.00005
New—Biomass Fluidized Bed	0.008	0.004	0.0000002	40	0.007
New—Biomass Suspension Burner/Dutch Oven	0.008	0.004	0.0000002	1010	0.03
New—Biomass Fuel Cells	0.008	0.004	0.0000002	270	0.0005
New—Liquid	0.002	0.0004	0.0000003	1	0.002
New—Gas (Other Process Gases)	0.003	0.000003	0.0000002	1	0.009

The proposed emission limits in the above table apply only to existing boilers and process heaters that have a designed heat input capacity of 10 million British thermal units (Btu) per hour or greater. Pursuant to CAA section 112(h), we are proposing a work practice standard for three particular classes of boilers and process heaters: Existing units that have a designed heat input capacity of less than 10 million Btu per hour and new and existing units in the Gas 1 (natural gas/refinery gas) subcategory and in the metal process furnaces subcategory. The work practice standard being proposed for these boilers and process heaters would require the implementation of a tune-up program as described in section III.F of this preamble.

We are also proposing a beyond-the-floor standard for all existing major source facilities having affected boilers or process heaters that would require the performance of a one-time energy assessment, as described in section III.F

of this preamble, by qualified personnel, on the affected boilers and facility to identify any cost-effective energy conservation measures.

E. What are the startup, shutdown, and malfunction (SSM) requirements?

The United States Court of Appeals for the District of Columbia Circuit vacated portions of two provisions in EPA's CAA Section 112 regulations governing the emissions of HAP during periods of startup, shutdown, and malfunction (SSM). *Sierra Club v. EPA*, 551 F.3d 1019 (DC Cir. 2008), cert. denied, 2010 U.S. LEXIS 2265 (2010). Specifically, the Court vacated the SSM exemption contained in 40 CFR 63.6(f)(1) and 40 CFR 63.6(h)(1), that are part of a regulation, commonly referred to as the "General Provisions Rule," that EPA promulgated under section 112 of the CAA. When incorporated into CAA Section 112(d) regulations for specific source categories, these two provisions exempt sources from the requirement to

comply with the otherwise applicable CAA section 112(d) emission standard during periods of SSM.

Consistent with *Sierra Club v. EPA*, EPA has established standards in this rule that apply at all times. EPA has attempted to ensure that we have not incorporated into proposed regulatory language any provisions that are inappropriate, unnecessary, or redundant in the absence of an SSM exemption. We are specifically seeking comment on whether there are any such provisions that we have inadvertently incorporated or overlooked. We also request comment on whether there are additional provisions that should be added to regulatory text in light of the absence of an SSM exemption and provisions related to the SSM exemption (such as the SSM plan requirement and SSM recordkeeping and reporting provisions).

In establishing the standards in this rule, EPA has taken into account startup and shutdown periods and, for the

² Heat input means heat derived from combustion of fuel in a boiler or process heater and does not

include the heat derived from preheated combustion air, recirculated flue gases or exhaust

gases from other sources (such as stationary gas turbines, internal combustion engines, and kilns).

**TABLE 1—EMISSION LIMITS AND WORK PRACTICE STANDARDS FOR BOILERS
AND PROCESS HEATERS [(Pounds per million British thermal units (lb/MMBtu)]**

Source	Subcategory	Particulate Matter (PM)	or	Total Selected Metals	Hydrogen Chloride (HCl)	Mercury (Hg)	Carbon Monoxide (CO) (ppm)
New or reconstructed Boiler or Process Heater	Solid Fuel, Large Unit.	0.025	or	0.0003	0.02	0.000003	400 (@7% oxygen).
	Solid Fuel, Small Unit.	0.025	or	0.0003	0.02	0.000003	
	Solid Fuel, Limited Use.	0.025	or	0.0003	0.02	0.000003	400 (@7% oxygen).
	Liquid Fuel, Large Unit.	0.03	.....	.....	0.0005	.....	400 (@3% oxygen).
Existing Boiler or Process Heater	Liquid Fuel, Small Unit.	0.03	.....	.....	0.0009	.....	400 (@3% oxygen).
	Liquid Fuel, Limited Use.	0.03	.....	.....	0.0009	.....
	Gaseous Fuel, Large Unit.	.....	.....	.....	.....	.....	400 (@3% oxygen).
	Gaseous Fuel, Small Unit.	.....	.....	.....	.....	.....	400 (@3% oxygen).
	Gaseous Fuel Limited Use.	.....	.....	.....	.....	.....
	Solid Fuel, Large Unit.	0.07	or	0.001	0.09	0.000009	400 (@3% oxygen).
	Solid Fuel, Small Unit.	.....	.....	.....	.....	.....
	Solid Fuel, Limited Use.	0.21	or	0.004	.....	.....	400 (@3% oxygen).
	Liquid Fuel, Large Unit.	.....	.....	.....	.....	.....
	Liquid Fuel, Small Unit.	.....	.....	.....	.....	.....
	Liquid Fuel, Limited Use.	.....	.....	.....	.....	.....
	Gaseous Fuel.	.....	.....	.....	.....	.....	.....