

# Fact Sheet

Existing Hospital/Medical/Infectious Waste Incinerators --  
(formerly known as medical waste incinerators or MWI)

## Promulgated Subpart Ce Emission Guidelines

### APPLICABILITY

The subpart Ce emission guidelines apply to existing HMIWI (note: abbreviations are defined at the end of the fact sheet) that commenced construction on or before June 20, 1996. The intent of the guidelines is to initiate State action to develop State regulations controlling emissions from existing HMIWI. The State regulations developed in response to these emission guidelines will apply to about 2,400 existing HMIWI.

### BACKGROUND

This action adds subpart Ce to 40 CFR part 60. Subpart Ce promulgates emission guidelines and compliance schedules for use by States in developing State regulations to control emissions from existing HMIWI. The promulgated guidelines implement sections 111(d) and 129 of the Clean Air Act. Section 129 requires the Administrator to establish emission guidelines pursuant to section 111 and 129 for HMIWI. Through the State regulations, the guidelines require existing HMIWI to control emissions of air pollutants to levels that reflect the degree of emission reduction based on MACT. In addition, the guidelines include requirements for waste management and HMIWI operator training and qualification.

### POLLUTANTS REGULATED

Consistent with section 129 of the Clean Air Act, the subpart Ce emission guidelines include numerical emission limits for PM, opacity, CO, dioxin/furan, HCl, SO<sub>2</sub>, NO<sub>x</sub>, Pb, Cd, and Hg.

### EMISSION GUIDELINES

The emission guidelines will reduce emissions from HMIWI by requiring States to develop regulations limiting emissions from existing HMIWI. The numerical emission limits and other provisions of the guidelines are summarized in the attached emission guidelines summary table.

### NATIONAL COSTS

It is expected that many facilities which currently operate onsite incinerators will switch to less expensive methods of treatment and disposal when faced with the compliance costs associated with the emission guidelines. Under this scenario, the total annual cost increase to implement the emission guidelines is estimated to range from \$59 million/yr to \$120 million/yr, depending on the amount of switching that takes place. The overall nationwide cost increase per unit of waste treated is estimated to range from \$77 to \$156/Mg. These costs represent the total cost increase for the guidelines over current baseline conditions.

### NATIONAL EMISSION REDUCTIONS

The guidelines are expected to reduce emissions from existing HMIWI as follows:

Pollutant	Baseline emissions	Nationwide emission reduction	Nationwide emission reduction (percent) <sup>a</sup>
PM, Mg/yr	940	820 to 870	88% to 92%
CO, Mg/yr	460	340 to 380	75% to 82%
total dioxin/ furan <sup>b</sup> , g/yr	7,200	6,900 to 7,000	96% to 97%
dioxin/furan TEQ <sup>b</sup> , g/yr	148	141 to 143	95% to 97%
HCl, Mg/yr	5,700	5,600	98%
SO <sub>2</sub> , Mg/yr	250	0 to 74	0% to 30%
NO <sub>x</sub> , Mg/yr	1,200	0 to 350	0% to 30%
Pb, Mg/yr	11	8.6 to 9.4	80% to 87%
Cd, Mg/yr	1.2	0.91 to 1.0	75% to 84%
Hg, Mg/yr	14.5	13.5 to 13.8	93% to 95%

<sup>a</sup> These reductions represent reductions from the regulatory baseline. Percent reductions have been calculated based on the actual (unrounded) values for baseline emissions and nationwide emissions reduction.

<sup>b</sup> Total dioxin/furan reflects total tetra- through octa- chlorinated dibenzo-p-dioxins and dibenzofurans, as measured by EPA Method 23. TEQ reflects the toxic equivalent quantity of 2,3,7,8-tetrachlorinated dibenzo-p-dioxin using international toxic equivalency factors.

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### EMISSION GUIDELINES SUMMARY TABLE (subpart Ce)

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#### Applicability

As discussed earlier, the promulgated guidelines apply to existing HMIWI units. An HMIWI is defined as any device which burns any amount of hospital waste or medical/infectious waste (see the regulatory text for definitions). However, certain exemptions apply, as follows:

- Combustors subject to subpart Cb, Ea, or Eb (standards and guidelines for certain municipal waste combustors) are not subject to subpart Ce, regardless of the amount of hospital waste or medical/infectious waste burned.
- Combustors subject to a section 3005 permit under the Solid Waste Disposal Act are not subject to subpart Ce.
- Devices that co-fire hospital waste and/or medical/infectious waste with other fuels or wastes and combust 10 percent or less hospital waste and medical/infectious waste by weight (on a calendar quarter basis) are exempt from the guidelines, but must notify the Administrator of an exemption claim and keep records of fuels and wastes combusted. For purposes of calculating the 10 percent hospital and medical/infectious waste, three types of waste (pathological waste, low-level radioactive waste, and chemotherapeutic waste) are considered "other" waste, even if they meet the definition of hospital waste or medical/infectious waste.
- The guidelines do not apply during periods when only pathological, low-level radioactive, and/or chemotherapeutic waste is being burned. The facility must keep records indicating the time periods when only these wastes were combusted.

The HMIWI source category is divided into three subcategories based on waste burning capacity: small ( $\leq 200$  lb/hr), medium ( $>200$  to  $500$  lb/hr), and large ( $>500$  lb/hr). Size may be determined by the maximum design capacity or by establishing an enforceable limit (the "maximum charge rate") on the amount of waste burned per hour. In other words, sources may change their size designation by establishing a maximum charge rate that is less than their design capacity. Separate emission limitations apply to each subcategory of existing HMIWI.

The guidelines contain optional (less stringent) emission limits for small "rural" HMIWI that are: (1) located more than 50 miles from the nearest Standard Metropolitan Statistical Area, and (2) burn less than 2,000 pounds of waste per week.

Numerical Emission Limits:

- The guidelines establish a 10 percent opacity limit for all existing HMIWI
- Pollutant emission limits for small existing HMIWI are as follows (corrected to 7 percent O<sub>2</sub>):

<u>Pollutant</u>	<u>Emission limit</u>	<u>Basis</u>
PM	115 mg/dscm	low efficiency wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
CO	40 ppm <sub>dv</sub>	good combustion
dioxin/furan <sup>b</sup>	2.3 ng/dscm TEQ or 125 ng/dscm total <sup>b</sup>	wet scrubber <sup>a</sup> or DI/FF with carbon <sup>a</sup> or SD/FF with carbon <sup>a</sup>
HCl	100 ppm <sub>dv</sub> or 93 percent reduction	wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
SO <sub>2</sub>	55 ppm <sub>dv</sub>	no control
NO <sub>x</sub>	250 ppm <sub>dv</sub>	no control
Pb	1.2 mg/dscm or 70 percent reduction	wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
Cd	0.16 mg/dscm or 65 percent reduction	wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
Hg	0.55 mg/dscm or 85 percent reduction	wet scrubber <sup>a</sup> or DI/FF with carbon <sup>a</sup> or SD/FF with carbon <sup>a</sup>

- Optional pollutant emission limits for existing small "rural" HMIWI are as follows (corrected to 7 percent O<sub>2</sub>):

<u>Pollutant</u>	<u>Emission limit</u>	<u>Basis</u>
PM	197 mg/dscm	good combustion
CO	40 ppm <sub>dv</sub>	good combustion
dioxin/furan <sup>b</sup>	15 ng/dscm TEQ or 800 ng/dscm total <sup>b</sup>	good combustion
HCl	3,100 ppm <sub>dv</sub>	no control
SO <sub>2</sub>	55 ppm <sub>dv</sub>	no control
NO <sub>x</sub>	250 ppm <sub>dv</sub>	no control
Pb	10 mg/dscm	no control
Cd	4 mg/dscm	no control
Hg	7.5 mg/dscm	Hg separation

- Pollutant emission limits for medium existing HMIWI are as follows (corrected to 7 percent O<sub>2</sub>):

<u>Pollutant</u>	<u>Emission limit</u>	<u>Basis</u>
PM	69 mg/dscm	moderate efficiency wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
CO	40 ppm <sub>dv</sub>	good combustion
dioxin/furan <sup>b</sup>	2.3 ng/dscm TEQ or 125 ng/dscm total <sup>b</sup>	wet scrubber <sup>a</sup> or DI/FF with carbon <sup>a</sup> or SD/FF with carbon <sup>a</sup>
HCl	100 ppm <sub>dv</sub> or 93 percent reduction	wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
SO <sub>2</sub>	55 ppm <sub>dv</sub>	no control
NO <sub>x</sub>	250 ppm <sub>dv</sub>	no control
Pb	1.2 mg/dscm or 70 percent reduction	wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
Cd	0.16 mg/dscm or 65 percent reduction	wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
Hg	0.55 mg/dscm or 85 percent reduction	wet scrubber <sup>a</sup> or DI/FF with carbon <sup>a</sup> or SD/FF with carbon <sup>a</sup>

- Pollutant emission limits for large existing HMIWI are as follows (corrected to 7 percent O<sub>2</sub>):

<u>Pollutant</u>	<u>Emission limit</u>	<u>Basis</u>
PM	34 mg/dscm	high efficiency wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
CO	40 ppm <sub>dv</sub>	good combustion
dioxin/furan <sup>b</sup>	2.3 ng/dscm TEQ or 125 ng/dscm total <sup>b</sup>	wet scrubber <sup>a</sup> or DI/FF with carbon <sup>a</sup> or SD/FF with carbon <sup>a</sup>
HCl	100 ppm <sub>dv</sub> or 93 percent reduction	wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
SO <sub>2</sub>	55 ppm <sub>dv</sub>	no control
NO <sub>x</sub>	250 ppm <sub>dv</sub>	no control
Pb	1.2 mg/dscm or 70 percent reduction	wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
Cd	0.16 mg/dscm or 65 percent reduction	wet scrubber <sup>a</sup> or DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
Hg	0.55 mg/dscm or 85 percent reduction	wet scrubber <sup>a</sup> or DI/FF with carbon <sup>a</sup> or SD/FF with carbon <sup>a</sup>

### Compliance Testing/Monitoring Requirements

PM, CO, dioxin/furan, HCl, Pb, Cd, Hg, and opacity Initial stack test  
 -- Compliance test by EPA Method 5 (PM), 10 or 10B (CO), 23 (dioxin/furan), 26 (HCl), 29 (Pb, Cd, and Hg), and 9 (opacity)

CO -- Compliance test by EPA Method 10 or 10B Annual or third year<sup>c</sup> stack test

PM -- Compliance test by EPA Method 5	Annual or third year <sup>c</sup> stack test
HCl -- Compliance test by EPA Method 26	Annual or third year <sup>c</sup> stack test
Opacity -- Compliance test by EPA Method 9	Annual stack test

For small existing HMIWI meeting the "rural" criteria, annual inspections are required instead of repeat stack tests for PM, CO, and HCl.

The guidelines require that a designated facility monitor HMIWI and APCD operating parameters. Operating parameter limits are established during the initial performance test. The HMIWI operating parameters to be monitored include charge rate, secondary chamber temperature, and bypass stack temperature. An HMIWI equipped with a dry scrubber (DI/FF or SD/FF) must monitor dioxin/furan and Hg sorbent (e.g., carbon) flow rate, HCl sorbent (e.g., lime) flow rate, and fabric filter inlet temperature. An HMIWI equipped with a wet scrubber must monitor pressure drop across the system (or horsepower or amperage), liquor flow rate and pH, and the flue gas temperature. An HMIWI equipped with a combined dry/wet scrubber must monitor all of the parameters listed above.

Operation of the facility outside established parameter limits are direct violations of the parameter limits. In addition, under certain conditions, operation outside established parameter limits constitute violations of specific emission limits unless the facility conducts a performance test showing compliance under the new operating parameter limits.

#### Operator Training/Qualification Requirements

The guidelines require that each facility have at least one trained and qualified operator on duty or on-call. The trained and qualified HMIWI operator must pass an HMIWI operator training course which is either State-approved or meets the requirements specified in the guidelines. Also, each facility is to develop site-specific information regarding HMIWI operation. Each employee involved with the operation of the HMIWI is required to review the operating information developed for the HMIWI. The site-specific information is required to be reviewed annually.

#### Waste Management

The guidelines require facilities to develop a waste management plan that identifies the feasibility and approach to separate certain components of the medical/infectious waste stream and hospital waste stream.

#### Compliance Schedule

State plans are required to include one of the following two schedules for full compliance with the State plan: (1) full compliance with the State plan within 1 year after EPA approval of the State plan; or (2) full compliance with the State plan within 3 years after EPA approval of the State plan, provided the State plan includes measurable and enforceable incremental steps of progress that will be taken to comply with the State plan.

The guidelines require compliance with the operator training and qualification, inspection, and waste management plan requirements within 1 year after the date of EPA approval of a State plan.

If an approved State plan is not in place by the date two years after promulgation of the emission guidelines, EPA must develop a Federal Plan. The Clean Air Act requires that all sources be in

compliance with the State or Federal Plan by the date five years after promulgation of the emission guidelines. Note that while the guidelines were signed by the EPA Administrator on August 15, 1997, the official date of "promulgation" is the date of publication in the Federal Register. The guidelines were published in the Federal Register on September 15, 1997. Consequently, State plans are due on September 15, 1998.

### Reporting and Recordkeeping

The emission guidelines require owners of existing facilities to maintain thorough records documenting the results of the initial and annual performance tests, continuous monitoring of site-specific operating parameters, initial and annual inspection, compliance with the operator training and qualification requirements, and the waste management plan. These records must be kept on file for at least 5 years.

The emission guidelines require owners or operators to submit the results of the initial and annual maintenance inspections and the results of the initial performance test and all subsequent performance tests. Additionally, reports on emission rates or operating parameters that have not been obtained or that exceed applicable limits must be submitted on a semi-annual basis. If no exceedances occur during a semi-annual period, the owner of the designated facility is required to submit an annual report stating that no exceedances occurred. All reports must be signed by the facilities manager.

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### Footnotes for Emission Guideline Summary Table:

<sup>a</sup>Includes good combustion

<sup>b</sup>Dioxin/furan are measured as total tetra- through octa- chlorinated dibenzo-p-dioxins and dibenzofurans, and then TEQ is determined using international toxicity equivalency factors as specified in the guidelines.

<sup>c</sup>Except for small existing HMIWI meeting the "rural" criteria, emissions of PM, CO, and HCl must be determined by an annual stack test. However, if an HMIWI passes all three annual compliance tests in a 3-year period, then the HMIWI may forgo testing for the next 2 years. If any subsequent test indicates noncompliance, then annual testing would again be needed until three annual tests in a row indicate compliance.

### Abbreviations used in this Fact Sheet and Summary Table

APCD	= Air Pollution Control Device
Cd	= cadmium
dioxin/furan	= dibenzo-p-dioxins and dibenzofurans
CO	= carbon monoxide
DI/FF	= dry injection/fabric filter
EPA	= United States Environmental Protection Agency
g	= gram
HCl	= hydrogen chloride
Hg	= mercury
HMIWI	= hospital/medical/infectious waste incinerator(s)

lb/hr	= pounds per hour
MACT	= maximum achievable control technology
Mg	= megagram
mg/dscm	= milligrams per dry standard cubic meter
ng/dscm	= nanograms per dry standard cubic meter
NO <sub>x</sub>	= nitrogen oxides
O <sub>2</sub>	= oxygen
Pb	= lead
PM	= particulate matter
ppmdv	= parts per million by dry volume
SO <sub>2</sub>	= sulfur dioxide
SD/FF	= spray dryer/fabric filter
TEQ	= toxic equivalency of 2,3,7,8-tetrachlorinated dibenzo-p-dioxin
yr	= year