

# Fact Sheet

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

Promulgated Subpart Ec New Source Performance Standards

## APPLICABILITY

The subpart Ec NSPS (note: abbreviations are defined at the end of this fact sheet) applies to new HMIWI that commence construction after June 20, 1996 or that commence modification after the effective date of the NSPS (six months after promulgation). While the NSPS 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 NSPS were published in the Federal Register on September 15, 1997. Consequently, the effective date of the NSPS is March 16, 1998. In the first 5 years after promulgation, the NSPS are expected to apply to about 10 to 70 new HMIWI.

## BACKGROUND

This action adds subpart Ec to 40 CFR part 60. These are direct Federal regulations that apply to new HMIWI. The promulgated standards implement sections 111(b) and 129 of the Clean Air Act. Section 129 requires the Administrator to establish performance standards pursuant to sections 111 and 129 for HMIWI. The NSPS require new HMIWI to control emissions of air pollutants to levels that reflect the degree of emission reduction based on MACT. In addition, the standards include requirements for fugitive fly ash/bottom ash emissions (where applicable), HMIWI operator training and qualification requirements, waste management requirements, and siting requirements.

## POLLUTANTS REGULATED

Consistent with section 129 of the Clean Air Act, the subpart Ec NSPS establishes numerical emission limits for PM, opacity, CO, dioxin/furan, HCl, SO<sub>2</sub>, NO<sub>x</sub>, Pb, Cd, and Hg. The standards also establish fugitive fly ash/bottom ash emission standards for some HMIWI.

## NEW SOURCE PERFORMANCE STANDARDS

The NSPS will reduce air pollution emissions from HMIWI by establishing emission limits and other requirements for new HMIWI. These requirements are summarized in the attached NSPS summary table.

## NATIONAL COSTS

In the absence of regulation, an estimated 245 new HMIWI are expected to be installed over the next 5 years. However, onsite incineration is only one of several medical waste treatment and disposal options. For many facilities, the equipment necessary to comply with the promulgated standards will make onsite incineration more expensive than other treatment and disposal options. Consequently, many facilities that would have chosen onsite incineration may decide to use a less expensive method of treatment and disposal. Under this scenario, the total annual cost increase to implement the standards is expected to be about \$12 million/year to \$26 million/yr in the fifth year after implementation of the NSPS, depending on the amount of switching to other waste disposal methods. The overall nationwide cost increase per unit of waste treated would be

about \$136 to \$295/Mg. These costs represent the total cost increase for the standards over current baseline conditions.

## NATIONAL EMISSION REDUCTIONS

The NSPS is expected to reduce emissions from new HMIWI in the fifth year following implementation as follows:

Pollutant	Baseline emissions	Nationwide emission reduction	Nationwide emission reduction (percent) <sup>a</sup>
PM, Mg/yr	28	23 to 25	85% to 92%
CO, Mg/yr	14	0 to 7.0	0% to 52%
total dioxin/ furan <sup>b</sup> , g/yr	47	35 to 41	75% to 87%
dioxin/ furan TEQ <sup>b</sup> , g/yr	1.1	0.80 to 0.93	74% to 87%
HCl, Mg/yr	64	61 to 62	95% to 98%
SO <sub>2</sub> , Mg/yr	28	0 to 15	0% to 52%
NO <sub>x</sub> , Mg/yr	130	0 to 69	0% to 52%
Pb, Mg/yr	0.39	0.33 to 0.36	85% to 92%
Cd, Mg/yr	0.051	0.042 to 0.046	83% to 91%
Hg, Mg/yr	0.21	0.10 to 0.16	45% to 74%

<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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### NEW SOURCE PERFORMANCE STANDARDS SUMMARY TABLE (subpart Ec)

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#### Applicability

As discussed earlier, the promulgated NSPS apply to new 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 Ec, 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 Ec.
- 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 standards, 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 standards 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 new HMIWI.

Numerical Emission Limits:

- The NSPS establishes a 10 percent opacity limit for all new HMIWI and establishes a 5 percent visible emissions limit for fugitive fly ash or bottom ash emissions from any fly ash or bottom ash storage or handling area within the property boundary of a facility that operates a new large HMIWI.
- Pollutant emission limits for new small 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>
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>
HCl	15 ppm <sub>dv</sub> or 99 percent reduction	wet scrubber <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>
Cd	0.16 mg/dscm or 65 percent reduction	wet scrubber <sup>a</sup>
Hg	0.55 mg/dscm or 85 percent reduction	wet scrubber <sup>a</sup>

- Pollutant emission limits for new medium and large 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>	0.6 ng/dscm TEQ or 25 ng/dscm total <sup>b</sup>	DI/FF with carbon <sup>a</sup> or SD/FF with carbon <sup>a</sup>
HCl	15 ppm <sub>dv</sub> or	wet scrubber <sup>a</sup> or SD/FF <sup>a</sup>

	99 percent reduction	
SO <sub>2</sub>	55 ppm <sub>dv</sub>	no control
NO <sub>x</sub>	250 ppm <sub>dv</sub>	no control
Pb	0.07 mg/dscm or 98 percent reduction	DI/FF <sup>a</sup> or SD/FF <sup>a</sup>
Cd	0.04 mg/dscm or 90 percent reduction	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 -- Compliance test by EPA Method 5 (PM), 10 or 10B (CO), 23 (dioxin/furan), 26 (HCl), 29 (Pb, Cd, and Hg), and 9 (opacity)	Initial stack test
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

Compliance with the fugitive emission limit is determined by conducting an annual performance test using EPA Method 22 when ash is removed from the incinerator and when ash is removed from the air pollution control device.

The standards require that an affected 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 standards 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 standards. 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 standards 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.

## Siting Requirements

The standards require the potential owner of an affected facility for which construction is commenced after the date of promulgation of the standards to prepare an analysis of the impacts of the new HMIWI. The analysis must consider air pollution control alternatives that minimize, on a site-specific basis, to the maximum extent practicable, potential risks to public health or the environment. The siting requirements do not apply to existing or modified HMIWI.

## Reporting and Recordkeeping

The standards require owners of affected facilities to submit notifications concerning construction and initial startup of the affected facility and the waste management plan. Owners and operators are also required to maintain thorough records documenting the results of the initial and annual performance tests, continuous monitoring of site-specific operating parameters, compliance with the siting requirements, and compliance with the operator training and qualification requirements. These records must be kept on file for at least 5 years.

Owners or operators of affected facilities are required to submit the results of the initial performance test and all subsequent performance tests. Also, reports on 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 affected facility is required to submit an annual report stating that no exceedances occurred. All reports submitted must be signed by the facilities manager.

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## Footnotes for New Source Performance Standards Summary Table:

<sup>a</sup> Includes good combustion.

<sup>b</sup>Dioxins/furans 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 standard.

<sup>c</sup>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
NSPS	= new source performance standards
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