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# Polychlorinated Biphenyl Inspection Manual

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Office of Compliance
Office of Enforcement and Compliance Assurance
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http://www.epa.gov/compliance/resources/publications/monitoring/manuals.html

# Appendix K

# High Efficiency Boilers

PCB regulations allow for disposal of specified PCB *fluids* with concentrations of 50 to less than 500 ppm PCBs in high-efficiency boilers. Boilers must meet certain design and operating criteria. These technical requirements differ depending upon the type of liquid intended for disposal, as discussed below. Other regulatory provisions (e.g., marking, storage) may also apply and, likewise, will differ based on the waste to be disposed.

Wastes Acceptable for Disposal

In general, two types of PCB-contaminated liquids may be disposed of in high-efficiency boilers:

- Mineral oil dielectric fluid from PCB-contaminated electrical equipment containing PCBs in concentrations of 50 to less than 500 ppm. §761.60(a)(2)(iii)

- Liquids other than mineral dielectric fluid containing PCBs in concentrations of 50 to less than 500 ppm.

Technical requirements applicable to wastes authorized for disposal in high-efficiency boilers are described below under the relevant regulatory provisions. Requirements applicable to each of the two waste fluid categories are discussed separately, followed by a summary of provisions that applies to both categories.

| Regulatory Requirements | Inspection Procedures |
|---|---|
| Owners/operators of high efficiency boilers burning mineral oil dielectric fluid containing a PCB concentration of ≥ 50 ppm but < 500 ppm must operate according to certain parameters. §761.71(a) | Verify that high efficiency boilers burning mineral oil dielectric fluid containing a PCB concentration of ≥ 50 ppm, but <500 ppm meet the following criteria:<br>-the boiler is rated at a minimum of 50 million BTU hours (by checking the manufacturer's manual or website)<br>-if the boiler uses natural gas or oil as the primary fuel, the CO concentration<br>in the stack is ≤ 50 ppm and the excess oxygen is at least 3% when PCBs are being burned<br>-if the boiler uses coal as the primary fuel, the CO concentration in the stack is ≤ 100 ppm and the excess oxygen is at least 3% when PCBs are being burned<br>-the mineral oil dielectric fluid does not comprise more than 10% (on a volume basis) of the total fuel feed rate<br>-the mineral oil dielectric fluid is not fed into the boiler unless the boiler is operating at its normal operating temperature (this prohibits feeding these fluids during either start up or shut down operations)<br>-the owner or operator of the boiler does one of the following:<br>--continuously monitors and records the CO concentration and excess oxygen percentage in the stack gas while burning mineral oil dielectric fluid<br>--if the boiler will burn <30,000 gal of mineral oil dielectric fluid per year, measures and records the CO concentration and excess oxygen percentage in the stack gas at regular intervals of no longer than 60 min while burning mineral oil dielectric fluid. |

| Regulatory Requirements | Inspection Procedures |
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| Owners/operators of high efficiency boilers burning mineral oil dielectric fluid containing a PCB concentration of ≥ 50 ppm but < 500 ppm must operate according to certain parameters. §761.71(a) (Continued) | -the primary fuel feed rates, mineral oil dielectric fluid feed rates, and total quantities of both primary fuel and mineral oil dielectric fluid fed to the boiler are measured and recorded at regular intervals of no longer than 15 min while burning mineral oil dielectric fluid<br><br>-the CO concentration and the excess oxygen percentage are checked at least once every hour that mineral oil dielectric fluid is burned. If either measurement falls below the levels specified in this section, the flow of mineral oil dielectric fluid to the boiler is stopped immediately.<br><br>Verify that 30 days before any person burns mineral oil dielectric fluid in the boiler, the owner or operator provides written notice to the EPA Regional Administrator for the EPA Region in which the boiler is located.<br><br>Verify that the notice contains the following information:<br>-the name and address of the owner or operator of the boiler and the address of the boiler<br>-the boiler rating in units of BTU/hour<br><br>-the CO concentration and the excess oxygen percentage in the stack of the boiler when it is operated in a manner similar to the manner in which it will be operated when mineral oil dielectric fluid is burned<br><br>-the type of equipment, apparatus, and procedures to be used to control the feed of mineral oil dielectric fluid to the boiler and to monitor and record the CO concentration and excess oxygen percentage in the stack. |

| Regulatory Requirements | Inspection Procedures |
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| Owners/operators of high efficiency boilers burning mineral oil dielectric fluid containing a PCB concentration of ≥ 50 ppm but < 500 ppm must operate according to certain parameters. §761.71(a) (Continued) | Verify that, when burning mineral oil dielectric fluid, the boiler operates at a level of output no less than the output at which the required measurements were taken.<br><br>Verify that any person burning mineral oil dielectric fluid in a boiler obtains the following information and retains the information for 5 yr at the boiler location<br>-the data which is required to be collected<br>-the quantity of mineral oil dielectric fluid burned in the boiler each month. |
| Owners/operators of high efficiency boilers burning liquids other than mineral oil dielectric fluid containing a PCB concentration of ≥ 50 ppm but < 500 ppm must operate according to certain parameters. §761.71(b) | Verify that a high efficiency boiler burning liquids other than mineral oil dielectric fluid containing a PCB concentration of ≥ 50 ppm but < 500 ppm meets the following criteria:<br>-the boiler is rated at a minimum of 50 million BTU/hour<br><br>-if the boiler uses natural gas or oil as the primary fuel, the carbon monoxide concentration in the stack is ≤ 50 ppm and the excess oxygen is at least 3% when PCBs are being burned<br><br>-if the boiler uses coal as the primary fuel, the carbon monoxide concentration in the stack is ≤ 100 ppm and the excess oxygen is at least 3% when PCBs are being burned |
| | -the waste does not comprise more than 10% (on a volume basis) of the total fuel feed rate<br><br>-the waste is not fed into the boiler unless the boiler is operating at its normal operating temperature (this prohibits feeding these fluids during either start up or shut down operations) |

| Regulatory Requirements | Inspection Procedures |
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| Owners/operators of high efficiency boilers burning liquids other than mineral oil dielectric fluid containing a PCB concentration of ≥ 50 ppm but < 500 ppm must operate according to certain parameters. §761.71(b) (Continued) | -the owner or operator of the boiler does one of the following:<br>-- continuously monitor and record the CO concentration and excess oxygen percentage in the stack gas while burning waste fluid<br>-- if the boiler will burn <30,000 gal of waste fluid per year, measure and record the CO concentration and excess oxygen percentage in the stack gas at regular intervals of no longer than 60 min while burning waste fluid<br><br>-the primary fuel feed rate, waste fluid feed rate, and total quantities of both primary fuel and waste fluid fed to the boiler are measured and recorded at regular intervals of no longer than 15 min while burning waste fluid<br>-the CO concentration and the excess oxygen percentage are checked at least once every hour that the waste is burned. If either measurement falls below the specified levels, the flow of waste to the boiler is stopped immediately. |
| | Verify that the owner/operator obtained approval from the EPA Regional Administrator prior to burning liquids other than mineral oil dielectric fluid containing a PCB concentration of ≥ 50 ppm but < 500 ppm.<br><br>Verify that the request for approval contains the following:<br>-the name and address of the owner or operator of the boiler and the address of the boiler<br>-the boiler rating in units of BTU/hour<br>-the CO concentration and the excess oxygen percentage in the stack of the boiler when it is operated in a manner similar to the manner in which it will be operated when low concentration PCB liquid is burned |

| Regulatory Requirements | Inspection Procedures |
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| Owners/operators of high efficiency boilers burning liquids other than mineral oil dielectric fluid containing a PCB concentration of ≥ 50 ppm but < 500 ppm must operate according to certain parameters. §761.71(b) (Continued) | -the type of equipment, apparatus, and procedures to be used to control the feed of mineral oil dielectric fluid to the boiler and to monitor and record the carbon monoxide concentration and excess oxygen percentage in the stack<br>-the type of waste to be burned (e.g., hydraulic fluid, contaminated fuel oil, heat transfer fluid, etc.)<br>-the concentration of PCBs and of any other chlorinated hydrocarbon in the waste and the results of analyses using the American Society of Testing and Materials (ASTM) methods |
| (NOTE: On the basis of the information in the request for approval, and any other available information, the U.S. EPA Regional Administrator may, at his/her discretion, find that the alternate disposal method will not present an unreasonable risk of injury to health or the environment and approve the use of the boiler.) | -the quantity of wastes estimated to be burned in a 30-day period<br>-an explanation of the procedures to be followed to ensure that burning the waste will not adversely affect the operation of the boiler such that combustion efficiency will decrease.<br><br>Verify that, when burning PCB wastes, the boiler operates at a level of output no less than the output when it is operated in a manner similar to the manner in which it will be operated when low concentration PCB liquid is burned.<br>Verify that the following information is obtained and retained for 5 yr at the boiler location:<br>-the data required to be collected<br>-the quantity of low concentration PCB liquid burned in the boiler each month<br>-the analysis of the waste required once a month for each month during which<br>low concentration PCB liquid is burned in the boiler. |