NOTE! 5D Michigan permit templates are under construction. Hyperlinks will be active when the template is available.

**5D Boiler Flowchart**

**Did boiler construction or reconstruction begin on or before 6/4/10?**

- **YES**
  - Review 5D Existing boiler and process heater requirements.
  - **Is unit a limited use unit?**
    - **YES**
      - Use 5D Existing Limited-use Template.
    - **NO**
      - Is the unit in the “unit designed to burn Gas 1” subcategory? (40 CFR 63.7575)
        - **YES**
          - Use 5D Existing Gas 1 Template.
          - Is unit capacity < 10 MM/Btu/hr?
            - **YES**
              - Use 5D Existing Small Template.
            - **NO**
              - See page 9 5D Boiler flowchart
        - **NO**
          - Is unit capacity < 10 MM/Btu/hr?
            - **YES**
              - Use 5D Existing Small Template.
            - **NO**
              - See page 9 5D Boiler flowchart

- **NO**
  - Review 5D New boiler and process heater requirements.
  - **Is unit a limited use unit?**
    - **YES**
      - Use 5D New Limited-use Template.
    - **NO**
      - Is the unit in the “unit designed to burn Gas 1” subcategory? (40 CFR 63.7575)
        - **YES**
          - Use 5D New Gas 1 Template.
          - Is unit capacity < 10 MM/Btu/hr?
            - **YES**
              - Use 5D New Small Template.
            - **NO**
              - See page 9 5D Boiler flowchart
        - **NO**
          - Is unit capacity < 10 MM/Btu/hr?
            - **YES**
              - Use 5D New Small Template.
            - **NO**
              - See page 9 5D Boiler flowchart

**Federally enforceable**

means requirements enforceable by the EPA, or those in a NESHAP, NSPS, the SIP; and in permits established under 40 CFR 52.21, 51.18 and 51.24. (40 CFR 63.7575)

**Gas 1**

units burn only natural gas, refinery gas, and/or other gaseous fuels that do not exceed a maximum concentration of 40 ug/m3 of mercury, no solid fuels, and may fire liquid fuel only during gas curtailment or gas interruption. Gas 1 boilers must otherwise only burn liquid fuel during testing, maintenance, or training not more than 48 hours per calendar year. (40 CFR 63.7575)

**NOTE!** Gas 1 new and existing units are subject to the least cumbersome NESHAP 5D requirements.
A boiler is an enclosed device that uses controlled flame combustion and has the primary purpose of recovering thermal energy in the form of steam or hot water. (40 CFR 63.11237)

Industrial sector examples include manufacturing, service, mining, and refining sector boilers. Commercial and institutional boiler examples include those at medical centers, research centers, municipal offices, schools, restaurants, hotels, laboratories, and laundries. (40 CFR 63.11237)

Gas boilers burn natural, process, landfill, coal-derived, refinery, hydrogen and/or bio gas(es), no solid fuels, and may fire liquid fuel during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours during any calendar year. (40 CFR 63.11237)
NESHAP 6J Existing Small Boiler flowchart continued from Page 2

Is boiler a seasonal boiler?

NO

Use 6J Existing Small Seasonal Boiler Template.

YES

Use the 6J Existing Small Area Oxygen Trim System Boiler Template.

Calculate the annual heat input for your unit.

NO

Did boiler burn coal and ≤ 15% biomass on an annual heat input basis?

NO

Use 6J Existing Small Coal Boiler Template.

YES

Use 6J Existing Small Biomass Boiler Template.

Did boiler burn > 15% biomass on an annual heat input basis?

NO

Did boiler burn oil on an annual heat input basis?

NO

Use 6J Existing Extra Small Oil Boiler Template.

YES

Is boiler an oil fired boiler with a heat input capacity of < 5 MM/Btu/hr?

NO

Use 6J Existing Small Oil Boiler Template.

YES

An oxygen trim system is a system of monitors that is used to maintain excess air at the desired level in a combustion device. It typically consists of a flue gas oxygen and/or carbon monoxide monitor that automatically provides a feedback signal to the combustion air controller. (40 CFR 63.11237)

A seasonal boiler is one that undergoes shutdown at least 7 consecutive months (210 consecutive days) due to seasonal conditions. Only exception is for compliance testing not to exceed 15 days during the off-season shutdown period. (40 CFR 63.11237)

Something went wrong! You eliminated all fuel use options indicating you don’t burn fuel. If you burn waste or non-hazardous secondary materials, contact your local district office air staff. Otherwise, try again and answer the questions consistent with your actual fuel use. Report tool problems to InfoBoilerNESHAP@michigan.gov.

Go back to page 3 question “Is boiler gas fired?” and start over.
NESHAP 6J Existing Large Boiler flowchart continued from Page 2

**Is boiler a seasonal boiler?**
- **YES** Use 6J Existing Large Seasonal Boiler Template.
- **NO** Calculate the annual heat input for your unit.

**Did boiler burn coal and < 15% biomass on an annual heat input basis?**
- **YES** Use 6J Existing Large Coal Boiler Template.
- **NO** Did boiler burn > 15% biomass on an annual heat input basis?

**Did boiler burn oil on an annual heat input basis?**
- **YES** Use 6J Existing Large Oil Boiler Template.
- **NO** Is boiler equipped with an oxygen trim system?

**Is boiler equipped with an oxygen trim system?**
- **YES** Use 6J Existing Large Biomass Oxygen Trim Boiler Template.
- **NO** Did boiler burn > 15% biomass on an annual heat input basis?

A seasonal boiler is one that undergoes shutdown at least 7 consecutive months (210 consecutive days) due to seasonal conditions. Only exception is for compliance testing not to exceed 15 days during the off-season shutdown period. (40 CFR 63.11237)

Something went wrong! You eliminated all fuel use options indicating you don’t burn fuel. If you burn waste or non-hazardous secondary materials, contact your local district office air staff. Otherwise, try again and answer the questions consistent with your actual fuel use. Report tool problems to InfoBoilerNESHAP@michigan.gov.

Go back to page 3 question “Is boiler gas fired?” and start over.

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Use the 6J New Small Boiler flowchart continued from Page 2.

YES

Use the 6J New Small Coal Boiler Template.

YES

Use the 6J New Small Seasonal Boiler Template.

YES

Use the 6J New Small Biomass Boiler Template.

YES

Use the 6J New Extra Small Oil Boiler Template.

YES

Use the 6J New Small Area Oxygen Trim System Boiler Template.

NO

Calculate the annual heat input for your unit.

NO

Is the boiler equipped with an oxygen trim system?

YES

A seasonal boiler is one that undergoes shutdown at least 7 consecutive months (210 consecutive days) due to seasonal conditions. Only exception is for compliance testing not to exceed 15 days during the off-season shutdown period. (40 CFR 63.11237)

NO

Is boiler a seasonal boiler?

NO

Did boiler burn oil on an annual heat input basis?

NO

Did boiler burn > 15% biomass on an annual heat input basis?

NO

Did boiler burn < 15% biomass on an annual heat input basis?

YES

Use the 6J New Small Coal Boiler Template.

NO

Did boiler burn coal and < 15% biomass on an annual heat input basis?

YES

Use the 6J New Small Coal Boiler Template.

NO

Is the boiler an oil fired boiler with a heat input capacity of < 5 MM/Btu/hr?

YES

Use 6J Existing Small Oil Boiler Template.

NO

Go back to page 3 question "Is boiler gas fired?" and start over.

Something went wrong! You eliminated all fuel use options indicating you don’t burn fuel. If you burn waste or non-hazardous secondary materials, contact your local district office air staff. Otherwise, try again and answer the questions consistent with your actual fuel use. Report tool problems to InfoBoilerNESHAP@michigan.gov.

An oxygen trim system is a system of monitors that is used to maintain excess oxygen and/or carbon monoxide levels in a combustion device. It typically consists of a fuel gas monitor that automatically provides a feedback signal to the combustion air controller. (40 CFR 63.11237)
A seasonal boiler is one that undergoes shutdown at least 7 consecutive months (210 consecutive days) due to seasonal conditions. Only exception is for compliance testing not to exceed 15 days during the off-season shutdown period. (40 CFR 63.11237)

1. **Is boiler a seasonal boiler?**
   - **YES**: Use the 6J New Large Seasonal Boiler Template.
   - **NO**: Calculate the annual heat input for your unit.

2. **Calculate the annual heat input for your unit.**
   - **YES**: Is boiler capacity ≥ 30 MM Btu/hr?
     - **YES**: Did boiler burn coal and ≤ 15% biomass on an annual heat input basis?
       - **YES**: Is boiler equipped with an oxygen trim system?
         - **YES**: Use 6J New Large Biomass Oxygen Trim Boiler Template.
         - **NO**: Use 6J New Large Biomass Boiler Template.
       - **NO**: Use 6J New Large Coal Boiler Template.
     - **NO**: Did boiler burn > 15% biomass on an annual heat input basis?
       - **YES**: Is boiler equipped with an oxygen trim system?
         - **YES**: Use 6J New Large Oil Oxygen Trim Boiler Template.
         - **NO**: Use 6J New Large Oil Boiler Template.
       - **NO**: Use 6J New Large Coal Boiler Template.
   - **NO**: Did boiler burn oil on an annual heat input basis?
     - **YES**: Use 6J New Large Oil Boiler Template.
     - **NO**: Use 6J New Large Coal Boiler Template.

3. **Something went wrong! You eliminated all fuel use options indicating you don’t burn fuel. If you burn waste or non-hazardous secondary materials, contact your local district office air staff. Otherwise, try again and answer the questions consistent with your actual fuel use. Report tool problems to InfoBoilerNESHAP@michigan.gov.**

   - Go back to page 3 question “Is boiler gas fired?” and start over.
An oxygen trim system is a system of monitors that is used to maintain excess air at the desired level in a combustion device. It typically consists of a flue gas oxygen and/or carbon monoxide monitor that automatically provides a feedback signal to the combustion air controller. (40 CFR 63.11237)
Units designed to burn gas 2 include those that burn only gas and biomass/bio-based solid fuel on an annual heat input basis, and no liquid fuels except when combusting fluidized bed fuel for periodic testing, maintenance, or operator training, not to exceed 48 hours during a calendar year. Gas 2 units may burn liquid fuel during periods of gas curtailment or interruption remain gas 2 units.

Units designed to burn liquid fuels are not gas 1 units and burn gaseous fuels, either alone or in combination, with less than 15 percent biomass/bio-based solid fuel on an annual heat input basis, and no liquid fuels except when combusting fluidized bed fuel for periodic testing, maintenance, or operator training, not to exceed 48 hours during a calendar year. Gas 2 units may burn liquid fuel during periods of gas curtailment or interruption.

Units designed to burn biomass/bio-based solid fuel include those designed to burn liquid fuel, vegetable oil, or any oil derived from plants or microorganisms, and comparable fuel as defined under 40 CFR 361.38. Light liquid fuels include distillate oil, vegetable oil, or any oil derived from plants or microorganisms.

Units designed to burn liquid fuel and biomass/bio-based solid fuel include those designed to burn liquid fuel, vegetable oil, or any oil derived from plants or microorganisms, and comparable fuel as defined under 40 CFR 361.38. Light liquid fuels include distillate oil, vegetable oil, or any oil derived from plants or microorganisms.

Units designed to burn liquid fuel and gas 2 include those that burn only liquid fuel derived from petroleum, used oil, liquid fuel, vegetable oil, and comparable fuel as defined under 40 CFR 361.38. Light liquid fuels include distillate oil, vegetable oil, or any oil derived from plants or microorganisms.

Units designed to burn liquid fuel and gas 2 include those that burn only liquid fuel derived from petroleum, used oil, liquid fuel, vegetable oil, and comparable fuel as defined under 40 CFR 361.38. Light liquid fuels include distillate oil, vegetable oil, or any oil derived from plants or microorganisms.

Units designed to burn gaseous fuels include those designed to burn liquid fuel, vegetable oil, or any oil derived from plants or microorganisms, and comparable fuel as defined under 40 CFR 361.38. Light liquid fuels include distillate oil, vegetable oil, or any oil derived from plants or microorganisms.

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Units designed to burn gaseous fuels include those designed to burn liquid fuel, vegetable oil, or any oil derived from plants or microorganisms, and comparable fuel as defined under 40 CFR 361.38. Light liquid fuels include distillate oil, vegetable oil, or any oil derived from plants or microorganisms.
Fuel Definitions:

**Distillate oil** means fuel oils that contain 0.05 weight percent nitrogen or less and comply with the specifications for fuel oil numbers 1 and 2, as defined by the American Society of Testing and Materials in ASTM D396 (incorporated by reference, see § 63.14) or diesel fuel oil numbers 1 and 2, as defined by the American Society for Testing and Materials in ASTM D975 (incorporated by reference, see § 63.14), kerosene, and biodiesel as defined by the American Society of Testing and Materials in ASTM D6751–11b (incorporated by reference, see § 60.14).

**Heavy liquid** includes residual oil and any other liquid fuel not classified as a light liquid.

**Light liquid** includes distillate oil, biodiesel, or vegetable oil.

**Liquid fuel** includes, but is not limited to, light liquid, heavy liquid, any form of liquid fuel derived from petroleum, used oil, liquid biofuels, biodiesel, vegetable oil, and comparable fuels as defined under 40 CFR 261.38.

**Ultra low sulfur liquid fuel** means a distillate oil that has less than or equal to 15 ppm sulfur.

**Fuel Definitions:**

**Gaseous fuel** includes, but is not limited to, natural gas, process gas, landfill gas, coal derived gas, refinery gas, and biogas. Blast furnace gas and process gases that are regulated under another subpart of this part, or part 60, part 61, or part 65 of this chapter, are exempted from this definition.

**Natural gas** means: (1) A naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in geologic formations beneath the earth’s surface, of which the principal constituent is methane; or (2) Liquefied petroleum gas, as defined in ASTM D1835 (incorporated by reference, see § 63.14); or (3) A mixture of hydrocarbons that maintains a gaseous state at ISO conditions. Additionally, natural gas must either be composed of at least 70 percent methane by volume or have a gross calorific value between 35 and 41 mega joules (MJ) per dry standard cubic meter (950 and 1,100 Btu per dry standard cubic foot); or (4) Propane or propane derived synthetic natural gas. Propane means a colorless gas derived from petroleum and natural gas, with the molecular structure \( C_3H_8 \).

**Other gas fuel** means a gaseous fuel that is not natural gas or refinery gas and does not exceed a maximum concentration of 40 microgram/cubic meter of mercury.