Department of Environmental Protection
Promulgation of Revised Chapter 2 of Title 15
Of the Rules of the City of New York
Concerning Performance Standards and Other Engineering Criteria
For Fossil Fuel Burning Boilers & Water Heaters

The final rules include the following important changes and additions:

- Provisions are added that address natural gas boilers.
- References to fuel oil grades #4 and #6 are removed, as relating to the use of such fuels in new boilers, as the installation of new boilers using those fuels is no longer permitted.
- The current combustion efficiency requirements for carbon dioxide have been deleted, as modern combustion efficiency analyzers now measure oxygen instead.
- The combustion efficiency requirement for oil-fired boilers is increased from 80 percent to 83 percent, and is established at 80 percent for natural gas-fired boilers.
- A requirement has been added for annual boiler tune-ups and combustion efficiency tests conducted by a qualified combustion tester using a calibrated combustion analyzer. The test results must be submitted with the application to renew the certificate of operation.
- The equipment approval process has been changed to allow professional engineers to certify equipment that is not on DEP's Accepted Equipment list, provided the equipment meets required criteria. Additionally, equipment that is listed by Underwriters' Laboratory, the Canadian Standards Association, or ETL is also acceptable. Unlisted or custom equipment will require certification by a professional engineer.
- Provisions that address condensing boilers are added.
- Provisions to allow for variances are added.
- Specific design requirements, such as heat release, combustion chamber, furnace volume, and oil handling, are deleted.
- Chimney radial distances have been updated for new chimneys to conform to the requirements set forth in the Mechanical Code and Fuel Gas Code.

Chapter 2. Engineering Criteria for Fossil Fuel Burning Boilers & Water Heaters

§2-01 Introduction and Applicability.

All owners of fossil fuel burning boilers and water heaters that require a certificate of operation under the New York City Air Pollution Control Code, as codified in Chapter 1 of Title 15 of the New York City Administrative Code, are subject to these rules.

In order for a work permit to be issued an application must be filed, accompanied by plans and any additional information. The application will enable the department to evaluate the design of equipment installation for compliance with the specification requirements described in section §2-11 of this chapter. Upon issuance of a work permit, the equipment shall be installed and adjusted to meet the performance requirements specified in section §2-08 of this chapter.

§2-02 Definitions.

(1) AP-42. "AP-42" means the United States Environmental Protection Agency publication AP-42, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources (fifth edition, 1995).

(2) ASHRAE. "ASHRAE" means the American Society of Heating, Refrigerating, and Air Conditioning Engineers.

(3) ASTM International. "ASTM International" is formerly known as the American Society for Testing and Materials.

(4) Barometric damper. "Barometric damper" means a device which consists of a damper counter-weighted and set such that boiler room barometric pressure will cause the damper to open or close to check variations in chimney draft and thereby maintain a constant draft directly upstream of the barometric draft regulator location.

(5) Biogas. "Biogas" means a mixture of methane and carbon dioxide produced by the anaerobic digestion of organic matter used as a fuel; includes landfill gas and digester gas.

(6) Boiler. "Boiler" means equipment that is used to heat water or any other transfer medium for the purpose of generating hot water and/or steam. The hot water and/or steam generated by a boiler may be used for heating, processing, or generating power for other purposes, including but not limited to, cooking and sanitation.

(7) British thermal unit. "British thermal unit" (Btu) means the amount of energy needed to heat one pound of water by one degree Fahrenheit.

(9) Burner. "Burner" means a device for the final conveyance of the fuel, or a mixture of fuel and air, to the combustion zone.

(9) Calibration test. "Calibration test" means to calibrate the qualified combustion analyzer in accordance with the manufacturer's specifications.

(10) Certificate of operation. "Certificate of operation" means a document issued by the department authorizing the operation of a specific piece of equipment or apparatus that may emit an air contaminant.

(11) Chimney. "Chimney" means a primarily vertical structure containing one or more flues, for the purpose of carrying gaseous products of combustion and air from fuel-burning appliances to the outside atmosphere.

(12) Chimney diameter. “Chimney diameter” means for round chimneys, the diameter shall be taken as the actual inside diameter. Where the chimney is provided with a liner, its inside diameter is the chimney diameter. For rectangular chimneys, the equivalent diameter for equal friction and capacity shall be used based on the inside rectangular dimensions.

(13) Chimney height. “Chimney height” is the distance from the centerline of the entrance of the combustion gases into the chimney to the top of the chimney.

(14) Combustion efficiency. “Combustion efficiency” means a measurement of the burner’s ability to burn fuel. It is the heat input minus the stack losses.

(15) Combustion efficiency test. “Combustion efficiency test” means a test of steady state combustion efficiency carried out by a qualified combustion tester using a qualified combustion analyzer.

(16) Condensing Boiler. “Condensing boiler” means a boiler that is designed to operate at stack temperatures where flue gases can condense, thereby recovering its latent heat of vaporization, before leaving the heat exchanger.

(17) Crown sheet. “Crown sheet” means that part of a boiler forming the top of the furnace in a firebox boiler, or the equivalent surface in other types.

(18) CSA Group. “CSA Group” means the Canadian Standards Association.

(19) Custom-design boiler. “Custom-design boiler” means a boiler designed for a specific installation.

(20) Department. “Department” shall mean the New York City Department of Environmental Protection.

(21) Draft. “Draft” shall mean negative static pressure, measured relative to atmospheric pressure.

(22) Dual-fuel. “Dual-fuel” means any equipment that uses both heating oil and gas as a fuel.

(23) Equivalent diameter. The term "equivalent diameter" referred to in the definition of transition section means the equivalent diameter of a square or rectangular section based on equal friction.

(24) ETL. “ETL” is the name of the certification listed mark from Intertek.

(25) Existing equipment. “Existing equipment” refers to any combustion equipment or apparatus legally installed before the promulgation of this chapter.

(26) Flame impingement. “Flame impingement” refers to the condition which exists when the flame resulting from the combustion of the fuel comes into contact with any interior surface of the furnace in such a way as to result in incomplete combustion of the fuel. Such condition may manifest itself in the formation of carbon at the contact location.

(27) Fuel oil grade no. 2. “Fuel oil grade no. 2” means a fuel oil meeting the current definition of fuel oil grade no. 2 as classified by ASTM International Standard D396-12.

(28) Fuel oil grade no 4. “Fuel oil grade no. 4” means a fuel oil meeting the current definition of fuel oil grade No. 4 as classified by ASTM International Standard D396-12.

(29) Fuel oil grade no 6. “Fuel oil grade no. 6” means a fuel oil meeting the current definition of fuel oil grade No. 6 as classified by ASTM International Standard D396-12.

(30) Flue gases. “Flue gases” means the products of combustion passing through the flue connection to the chimney.

(31) Furnace volume. “Furnace volume” is the space encompassed by the chamber floor, the refractory walls, the heat absorbing water walls of the boiler firebox, and the crown sheet, shell or water tubes of the boiler. If a target wall is installed in the furnace, the furnace volume shall be reduced by the volume behind the face of the target wall.

(32) Heat release. “Heat release” is the heat liberated by the combustion of the fuel (Btu/hr) per cubic foot of furnace volume.

(33) In-Kind Replacement. "In-kind replacement" means the replacement of a boiler or burner with equipment of the same make and model number.

(34) Induced draft fan. “Induced draft fan” is an acceptable fan intended for removal of flue gases from the boiler and providing pressure differential for proper combustion.

(35) Louver efficiency. “Louver efficiency” means the percentage of the total open area, not including obstructions such as blades and the frame, divided by the gross area of the louver.

(36) Low-fire setting. “Low-fire setting” is the setting which determines the oil firing rate at which burner ignition occurs where low-high-off, low-high-low-off, or modulating combustion controls are utilized based upon the manufacturer’s recommendations.

(37) Low-high-low-off combustion control. “Low-high-low-off combustion control” is a control capable of initiating the burner such that ignition occurs at the low-fire setting, after which the burner fires at the maximum heat input rating in order to satisfy the demand, and varies the coordinated fuel-air input, between the maximum heat input rating rate and the low-fire as a result of variations in demand.

(38) Low-high-off-combustion control. “Low-high-off combustion control” is a control capable of initiating the burner such that ignition occurs at the low-fire setting, after which the burner fires at the maximum heat input rating until the demand has been satisfied.

(39) Maximum Heat Input Rating. “Maximum heat input rating” means the maximum steady-state fuel firing rate of the burner, measured in Btu per hour of gross heat input, as determined by the manufacturer’s design rating of the burner.

(40) Mechanical ventilation. “Mechanical ventilation” is ventilation which is provided by a fan capable of maintaining the room in which the fuel burning equipment is located at a pressure not less than outside atmospheric pressure while the combustion equipment is in operation.

(41) Natural Gas. "Natural gas" means a mixture of methane and other gases with an odorant as supplied by the local utility serving the premises.

(42) New installation. “New installation” refers to new construction, for which combustion equipment or apparatus is installed.

(43) Non-openable window. “Non-openable window” refers to lot line windows which are not legally required for light and ventilation by the Building Code, Multiple Dwelling Code or other regulatory rule, code or statute.

(44) NOx. "NOx" means the pollutant oxides of nitrogen which is the term used to describe the sum of nitric oxide (NO), nitrogen dioxide (NO_2) and other oxides of nitrogen.

(45) On-off combustion control. “On-off combustion control” is a control capable of starting up or shutting down the burner in response to variations in demand.

(46) Opacity. “Opacity” means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background. Opacity is measured on a percent scale in accordance with U.S. EPA Method 9.

(47) Overall efficiency. “Overall efficiency” means the ratio of the energy output to the energy input or the heat input minus all the losses.

(48) Owner. “Owner” means and includes the owner of the equipment , a lessee of the equipment or his or her agent, a tenant, operator, or any other person who has regular control of equipment or apparatus.

(49) Particulate. Particulate means any air or gas-borne material, except water, that exists as a liquid or solid. The determination of the quantity of particulates present in a stack shall be determined in accordance with U.S. EPA Method 5.

(50) Percent oxygen ($\%O_2$). “Percent oxygen ($\%O_2$)” is the percentage of the dry flue gases that the oxygen occupies.

(51) Post-purge. “Post-purge” refers to the function of operating the burner fan after flame-out.

(52) Power operated draft regulator. “Power operated draft regulator” is a control which is capable of maintaining a constant pressure in the furnace under all normal operating conditions, and in addition is provided with a low-draft cut-off which will shut the burner off when the draft falls below a pre-selected minimum. The time relay shall delay switch action to prevent shut-down from initial exaggerated fluctuations in pressure.

(53) Pre-purge. “Pre-purge” refers to the function of operating the burner fan before flame ignition.

(54) Pressure differential. “Pressure differential” refers to the absolute value of the difference in pressure between any two points in the system.

(55) Qualified combustion analyzer. “Qualified combustion analyzer” means an instrument that is capable of directly measuring flue gas carbon monoxide, oxygen, and the temperatures of the boiler room, stack gas, calculating combustion efficiency for the specific fuel used, displaying the results, and creating an electronic or printed record of the results. All qualified combustion analyzers shall be calibrated to the manufacturer’s specifications.

(56) Qualified combustion tester. “Qualified combustion tester” means (i) a licensed New York City Class A and B oil burner equipment installer, or (ii) a professional engineer or registered architect licensed pursuant to Education Law section 7202 or 7302.

(57) Qualified combustion tuner. “Qualified combustion tuner” means (i) a licensed New York City Class A and B oil burner equipment installer (ii) or as established by rule.

(58) Radial distance. “Radial distance” means the shortest distance between a receptor location and the centerline of the chimney outlet.

(59) Receptor. “Receptor” is any point at which a person in a nearby building can become exposed to the flue gases emanating from the chimney of the subject installation (e.g., openable window, occupiable terrace). Receptor shall also include air-conditioning and ventilating intakes. (Note: non-openable windows are not considered to be receptor locations.)

(60) Smoke reading. “Smoke reading” means the measurement of smoke density as measured in accordance with ASTM International Standard D2156-09.

(61) Stack loss. “Stack loss” means the sensible heat carried away by the dry flue gas and the sensible and latent heat carried away by the water vapor in the flue gas.

(62) Transition section. “Transition section” means a section of duct, breeching or stack used to connect these elements with structures of different cross-sectional dimensions. The required length for such transition section must conform with:

$L = 4(D_1 – D_2)$

Where,

D_1 = the diameter (or equivalent diameter) of the larger cross-sectional structures.

D_2 = the diameter (or equivalent diameter) of the smaller cross-sectional structures.

(63) Venting Calculations: “Venting calculations” means calculations that determine the acceptance of the combustion air supply and boiler flue gas venting. These calculations include:

(1) Flue venting: draft for atmospheric or non-power vented boilers, equivalent length for direct vent or sealed combustion appliances,

(2) Combustion air: louvers, dedicated inlet or infiltration.

(64) UL**.** “UL” means the Underwriters’ Laboratory.

(65) Water Heater. “Water heater” means equipment which is used to heat and store water.

(66) Work Permit. "Work permit" means a permit issued for the installation of a device or apparatus.

§2-03 Variances.

(a) An application for any variance from these rules shall be made directly to the Department using an application form prescribed by the department. Work involving a variance may not commence before the receipt of the department’s approval of the application, which will be reviewed and processed within four weeks.

(b) The variance application shall be prepared by a professional engineer or registered architect and submitted by the owner or authorized agent, and must submit the application with the following information:

(1) Identification of those portions of the rules for which a variance is requested, providing each numbered section and subsection;

(2) Explanations as to why the procedures required by the rules would cause unreasonable hardship;

(3) A written proposal describing the alternative procedures the applicant will employ to satisfy the requirement as modified.

(c) The department will approve or deny the variance application to be filed on a form prescribed by the department, after considering several factors including whether the applicant has demonstrated undue hardship.

§2-04 Application for Work Permit/Certificate of Operation.

(a) *Filing of application.* (1) The application, supplementary data and calculation sheet(s) and plans must be signed and sealed by a professional engineer or registered architect licensed under §§7202 or 7302 of the New York State Education Law. The application must include all essential details pertaining to the equipment, and the manner in which new equipment will be installed. The department may accept online applications from licensed individuals who pre-register with the department. All documents must be professionally certified by the same person.

(2) Only one type and size of equipment may be included on any one application. For example, a boiler and furnace, different sizes of similar equipment, identical boilers with different (although equivalent) burners must be filed separately.

(3) When filed, the application must include any supplementary data and calculation sheet(s), plans and any additional forms as may be required by the department.

(4) All filings specifying condensing boilers must be submitted with the installation specific ventilation requirements (louver or mechanical ventilation fan specifics), breeching requirements (dimensions and length specifics), and chimney (stack) requirements (dimensions and height specifics) obtained from the manufacturer. Such calculations and summary sheets must be submitted. The filing engineer must certify that all of the manufacturer's recommendations and specifications will be followed in the use of materials, design, installation, and operation of the condensing boiler. The fresh-air requirements, draft calculations, chimney, and breeching plan required in this section must not apply to condensing boilers.

(b) *Contents of application.* The application must include the following:

(1) The authorization of the equipment owner and his or her name, address and signature. The signature must be that of the proprietor where the business is a sole proprietorship. If the business is a partnership, the signature must be that of a partner. In the case of a corporation, the signature must be that of an officer of the corporation. In all instances, the signatory must indicate his or her title after his or her signature.

(2) The certification of the engineer or architect and his name, address, signature and seal.

(3) A licensed oil-burner installer must certify all oil burning installations and dual-fuel installations. A licensed oil-burner installer or a licensed plumber must certify all gas-fired installations.

(i) If, at the time of filing an application, an installer has not yet been selected, the statement "To be submitted on amendment" must be shown on the application form in place of the certification of the licensed installer. The department will notify the engineer or architect when the application is approved. The work permit will not, however, be issued until the required certification and information is submitted.

(4) *Heat load calculations.* Heat load calculations must be submitted for new and replacement boilers only when the boiler maximum heat input rate size changes by more than 20 percent greater than the previously filed application of record. Heat load calculations must consist of a summary sheet documenting the boiler horsepower needed to meet the building load condition, consistent with the ASHRAE procedures, *see* 2009 ASHRAE Fundamentals, Chapters 17 and 18.

(5) *Detailed data on equipment.* Detailed data (as specified here) on the specific type of existing equipment or new equipment which is to be installed. Note that in the case of existing equipment, if a reasonable effort to determine the make and model number proves unsuccessful, an attempt must be made to compare unknown equipment to an equivalent known unit of equipment.

(6) *Venting Calculations.* Venting calculations for stack draft adequacy must be required for all new buildings, boilers, and chimneys. Calculations must be submitted on a form prescribed by the department or through summary sheets from computerized or hand venting calculations that conform to procedures in 2009 ASHRAE Fundamentals Chapter 21 and 2012 ASHRAE Systems and Equipment Chapter 35. The calculations must be stamped by a professional engineer. If needed, the department reserves the right to request that detailed venting calculations be submitted if further review is required.

(c) *Plans.* (1) The plans, as specified below, must be filed, with each application and must include the premise address of the installation. The plans must not be smaller than 8 1/2 × 11 inches nor larger than 11 x 17 inches and details must be shown legibly in black ink on a white background. When approved, the plans must be so designated and returned with the approved work permit. In addition to the specifics indicated below, elevation and plan views of various aspects of the installation must be required to schematically show the location of equipment, apparatus, controls, etc. Non-related piping, valves, electric wiring, controls and other construction details must not be included.

(2) *Plot plan.* The plot plan must include the following:

(i) building location.

(ii) location and names of cross streets and the northerly direction.

(iii) location of the boiler room and the stack outlet.

(iv) a statement which certifies: "The chimney extends a minimum distance of 3 ft above all construction located within 10 ft of the centerline of the chimney outlet."

(v) for new chimneys, a statement that certifies: "The minimum radial distance from the centerline of the chimney to an acceptable receptor location is ____ft," with the distance specified.

(vi) for existing chimneys, a statement that certifies: “The minimum radial distance from the centerline of the existing chimney to an acceptable receptor location

(a) located at a height equal to or greater than the chimney outlet is ____ft and

(b) located below the chimney outlet is ____ft," with the distance specified.

(vii) the engineer or architect must determine the distances for subdivisions (iv), (v), and (vi), to be shown in the blank spaces, in accordance with §2-13.

(3) *Boiler room layout.* The boiler room layout must include the following:

(i) boiler location.

(ii) burner location.

(iii) breeching layout schematic, including the length, elbows, cross sectional dimensions; and location of "test holes." In addition, a plan note must be required which indicates specific compliance with the distance requirements of "test holes" from dampers, etc.

(iv) location and cross-sectional dimensions of the stack. Only the cross-sectional dimension of the outlet must be required for existing stacks.

(v) location of fixed ventilation. Ducts and other such pertinent details must be shown and dimensioned. Length, elbows, cross-sectional dimensions and inlet and outlet locations must be included for any new ventilation ducts.

(vi) location of smoke alarms, draft controls, oil meters, fans, cleanouts, fuel pumps, etc., when applicable. These locations may be shown schematically.

(vii) locations of all combustion equipment located in the same room or on the same stack and not covered by the subject application, including the manufacturer, model number, and fuel delivery rate when not shown on the application. The fixed ventilation supplied for all combustion equipment must be clearly shown on the plans, even if all such equipment is not covered by the subject application.

(viii) a plan note must be acceptable in all instances where they serve the same purpose as plan details.

(4) *Boiler plan.* The boiler plan must include the following:

(i) plan and elevation views of the boiler showing overall boiler dimensions.

(ii) combustion chamber dimensions.

(iii) furnace volume and heat release calculations.

When the manufacturer's drawings with specifications are being submitted as a boiler plan, all copies must also specifically contain the model number, boiler gross output, actual total furnace volume, heat release, address of premise. Field measurements can be accepted for existing boilers in place of the manufacturer's drawings. Professional engineer/registered architect seal and signature is required for manufacturer's drawings and field measurement submittals.

(5) *Certificate of Compliance.* All oil-fired boilers and associated burners, boiler/burner assemblies, and control equipment installed under this chapter must comply with the following equipment acceptance requirements. This ensures that such equipment meets the minimum design and performance standards of the department. The list of accepted equipment will be posted on the internet, through a web portal that is linked to nyc.gov or any successor website

maintained by, or on behalf, of the city of New York. Equipment may be added to the list of accepted equipment upon application from the manufacturer on a form prescribed by the department, or where the department determines that the equipment has performed in a satisfactory manner.

Equipment Acceptance Requirements

(a) *List of accepted equipment.* If the application for the work permit is to install equipment that appears on the list of accepted equipment, no additional certification is required.

(b) *UL/CSA/ETL listed equipment.* If the application for the work permit is to install equipment that is listed by UL, CSA Group, or ETL, a certification of compliance from a professional engineer must be submitted on a form prescribed by the department.

(c) *Unlisted and custom equipment.* If the application for the work permit is to install custom equipment, or equipment that is not on the department's list of accepted equipment and is not UL, CSA Group, or ETL-listed, a certification of compliance from a professional engineer must be submitted on a form prescribed by the department.

§2-05

§2-06 Field Verification.

(a)(1) *New certificate of operation requests*. A request for inspection must be submitted by the installer or owner and must include the installer's certification that the installation has been completed in accordance with the Notice of Application/Plans Approval and is ready for inspection.

(2) The request for inspection must be submitted using forms prescribed by the department. The request must be submitted within thirty days of the equipment being capable of operation and before the expiration of the work permit.

(b) *Certificate of operation renewals*. The owner of a device that is required to have a certificate of operation or the owner's authorized representative must submit a request for inspection using a form prescribed by the department.

(c) *Appointments*. An appointment, arranged by the department, must be made such that the installer or owner must meet the department's engineer at the specified time and meeting place. Installations must be complete and ready for testing when the inspecting engineer(s) arrives.

The owner or his representative must ensure that the following facilities and/or conditions exist so as to enable the department's engineer to properly evaluate the installation:

(1) That entry and suitable access to all parts of the equipment and apparatus is provided.

(2) That adequate lighting is provided throughout the boiler room.

(3) That facilities, not necessarily of a permanent nature (for example a sturdy, appropriately sized ladder, or ladders), are provided to enable proper verification and testing of the installation. Wooden ladders are not acceptable.

(4) That the boiler room has no health and safety hazards. The existence of disintegrating suspected asbestos containing material, water or steam leak from a pressurized boiler, flue gas leak from the breeching, inadequate lighting, or any other hazard will preclude an inspection and performance test and will result in the issuance of a Notice of Installation Disapproval.

(5) That all equipment can be readily identified with regard to make, model, type, and any other applicable characteristics or designations.

(d) *Approvals and Reinspections. (i)* Upon completion of a satisfactory performance test and approval of inspection, the design firing rate of the burner must not be increased without notification to the department, and modification to the work permit / plan approval.

(ii) A reinspection will be required for failed performance tests and/or a disapproval of inspection. An additional form prescribed by the department must be submitted in order for the reinspection to occur.

§2-07 Cancellation of Field Appointments.

(a) A request to cancel an appointment must be submitted in writing at least 2 business days before the inspection date unless due to an emergency.

(b) The request for a new inspection must be made in accordance with §2-06 of these rules.

(c) A second inspection cancellation for the same equipment will result in the issuance of a Notice of Installation Disapproval.

§2-08 Performance Testing.

(a) *Performance requirements.* (1) All installations, including pre-existing equipment, must be required to operate such that upon evaluation of performance tests (as outlined in subdivision (e) below) it is determined that they meet the following minimum requirements:

(2) When the boiler is fired at 80 to 110 percent of the burner's maximum operational oil/gas delivery rate as specified in the application, provided that this is less than the burner's maximum design oil/gas delivery rate, oil burning installations must have a combustion efficiency of at least 83 percent and gas burning installations must have a combustion efficiency of at least 80 percent. Dual-fuel installations must meet the requirements for each respective fuel.

Oil fired installations which cannot achieve a combustion efficiency of at least 83 percent but which can achieve a combustion efficiency of at least 80 percent will have no more than one renewal cycle (three years) in which to perform necessary alterations to bring the equipment into compliance. Gas fired installations which cannot achieve a combustion efficiency of at least 80 percent will have one renewal cycle (three years) in which to perform necessary alterations to bring the equipment into compliance.

(3) When the boiler is fired at 80 to 110 percent of the burner's maximum operational oil/gas delivery rate as specified in the application, provided that this is less than the burner's maximum design oil/gas delivery rate, the maximum acceptable smoke reading must be smoke spot no. 3 in accordance with ASTM International Standard D2156-09.

(4) When the boiler is fired at 80 to 110 percent of the burner's maximum operational oil/gas delivery rate as specified in the application, provided that this is less than the burner's maximum design oil/gas delivery rate), the installation must be capable of providing adequate pressure differential (e.g., draft) at conditions specified in subdivision (e) of this section.

(5) For installations which have low-high-low-off or modulating combustion controls, adherence to the requirements in paragraphs (a)(1) and (2), listed above, must also be demonstrated when the burner is fired at low-fire. For installations which utilize modulating combustion controls, the department requires and reserves the right to verify that the performance requirements in paragraphs (a)(1) and (2), listed above, are also met at intermediate firing rates.

(6) For multiple boiler installations the requirements in paragraphs (a)(1), (2), (3) and (4), listed above, must be demonstrated for each boiler when said boilers are operated simultaneously rather than individually when there is sufficient load demand from the premise. However, each boiler in a multiple boiler installation, when fired separately (i.e., all other boilers are shut down), must also meet these requirements and the department reserves the right to verify same.

(7) In no case must the flame impinge on any interior surface within the furnace.

(b) *Preparation for performance tests.* In order to facilitate implementation of the performance test by the department's engineer, provision must be made by the installer, sufficiently in advance of the scheduled inspection, such that:

(1) Continuous, uninterrupted operation of the boiler at 80 to 110 percent of the burner's maximum operational oil/gas delivery rate as specified in the application, provided that this is less than the burner's maximum design oil/gas delivery rate, for a minimum period of twenty minutes is insured. Under no circumstances must the boiler pressure relief valve(s) be tampered with to accomplish this.

(2) Two 3/8 inch diameter holes are provided in the breeching, approximately 4 inches apart and placed so that the one closest to the boiler is approximately one breeching diameter downstream from the boiler outlet. Since these holes must be used for the measurement of boiler outlet gas temperature, percentage of O_2 and smoke reading, it is important that they be placed in the system such that air infiltration from a barometric damper, smoke alarm port, etc., does not affect the composition of the combustion gases.

(3) Two 3/8 inch diameter holes are provided in the breeching placed one on each side of any power operated draft regulator damper, approximately one breeching diameter from the centerline of the damper. Note that the location of one or both of these holes may, of necessity, be in the boiler outlet.

(4) All test holes are a minimum of one breeching diameter from any flow disturbance such as a bend, expansion or contraction.

(5) Any insulation is neatly removed from approximately a 4" × 4" area surrounding any test hole in the breeching.

(6) All test holes are kept closed with a sheet metal screw or other acceptable method when not being used for testing purposes. All test holes must be marked in such a way that their location can be readily determined.

(c) *Performance test equipment.* All test data obtained during the performance test must be recorded on a form provided by the department.

(d) *Procedure for performance tests.* The following is an outline of the procedure which must be used to obtain data necessary for evaluating the performance of an installation and determining whether it meets the requirements specified in subdivision (a), above.

(1) Verify that all conditions in the boiler room are characteristic of proper operating conditions (i.e., boiler room door is shut, non-fixed ventilation sources such as windows are shut, etc.).

(2) The burner must be started up and operated at 80 to 110 percent of the burner maximum operational oil/gas delivery rate as specified in the application, provided that this is less than the burner's maximum design oil/gas delivery rate, depending on the demand load throughout the sequence of steps specified in paragraph (4) below.

(3) The probe(s) of the testing equipment must be inserted into the test holes provided at the required locations.

(4) Commencing after burner startup, boiler outlet gas temperature must be read at one minute intervals until the difference between two successive readings is not greater than 5°F at which time steady state conditions will be assumed and the following data must be obtained and recorded:

(i) The boiler outlet gas temperature must be determined. In addition, the ambient air boiler room temperature in the vicinity of the burner must be determined.

(ii) The percent oxygen (O_2) in the flue gas must be determined.

(iii) The pressure differential across the damper of a power operated draft regulator must be determined. This is not applicable to condensing boilers.

(A) The pressure differential measurements and the gas temperature and outside ambient air temperature measurements must be used to determine whether adequate pressure differential (e.g., draft) can be provided when outside ambient air temperature is 94°F.

(B) When a power operated draft regulator is used, the pressure differential measured across the damper must be equal to or greater than the value obtained when the height of the stack (H) is multiplied by ΔDr/H, i.e.

$$\Delta P \geq H \times (\Delta Dr/H)$$

where, ΔP(inches H_2O) is the pressure differential measured across the power operated draft regulator damper.

$\Delta Dr/H$(inches H_2O/ft) is the differential draft per foot obtained from Table I using the outside ambient temperature measured when the performance test was conducted.

H(feet) is the height of the stack.

(C) When a barometric or manual damper is used, the theoretical pressure differential caused by the barometric or manual damper must be equal to or greater than the value obtained when the height of the stack is multiplied by ΔDr/H, i.e.

$$\Delta P \geq H \times (\Delta Dr/H)$$

where ΔP, ΔDr/H, and H are defined in (B).

The static pressure is measured at the boiler outlet. The barometric damper or manual damper is gradually opened until the calculated ΔP is measured. The barometric damper is then returned to its original setting and the manual damper is then returned to its initial position and fixed.

The department will review alternative demonstrations of adequate pressure differential if they comply with 2009 ASHRAE Fundamentals Chapter 21, and are stamped by a professional engineer.

(5) The smoke reading must be determined and recorded in accordance with ASTM D2156 (2009).

(6) For boilers which have low-high-low-off or modulating controls, upon completion of the above sequence of steps, the burner firing rate must be changed to low-fire for all boilers with a maximum heat input rating greater than 4.2 million Btu per hour.

(7) Dual-fuel burners will be tested separately for oil and gas on high fire and on low-fire if the maximum heat input rating is greater than 4.2 million Btu per hour.

(8) For multiple boiler installations, all boilers must be started up and operated simultaneously at 80 to 110 percent of their respective maximum operational oil/gas delivery rates as specified in the application, provided that this is less than the burner's maximum design oil/gas delivery rate, and the boiler outlet gas temperature, boiler room ambient air temperature, percentage of O_2, smoke reading, and pressure differential must be determined for each boiler. The burner firing rates for all boilers must then be changed to their respective low-fire firing rates, and the boiler outlet gas temperature, boiler room ambient air temperature, percentage of O_2 in the flue gas, and smoke reading, must be determined for each boiler at this firing rate.

(e) ***Evaluation.*** The boiler outlet gas temperature, boiler room air temperature, percentage of O_2 in the flue gas, draft measurement, and smoke reading data must be used to determine whether the installation meets the minimum performance requirements for combustion efficiency, adequate reserve draft and smoke reading.

§2-09 Annual Tune-ups and Record Keeping Requirements

An owner of equipment that is required to have a certificate of operation must perform annual tune-ups and combustion tests. Records of the dates and procedures of each tune-up and results of these tests must be kept by the owner for a minimum of five years and must be submitted within five business days if requested by the department.

(a) *Annual equipment tune-ups and combustion efficiency test*. (1) The owner of the equipment must commission a tune-up for the equipment and test the combustion efficiency. The

tune-up and combustion efficiency test must occur at both high-fire and normal operating conditions.

(i) A qualified combustion tester must perform a combustion efficiency test for each piece of equipment and each oil fired boiler in accordance with §2-08(a)(1).

(ii) The tune-up required to increase boiler efficiency must be conducted in accordance with Subpart JJJJJJ of Part 63 of Title 40 of the Code of Federal Regulations and the guidelines outlined by the department. The results of the tune-up must be recorded on a form provided by the department.

(b) *Combustion Analyzer Requirements*. (1) The combustion efficiency test must be performed using a qualified combustion analyzer that has passed an annual calibration test. The results of the annual calibration test must be kept and be submitted within five business days if requested by the department. If the minimum combustion efficiencies are not achieved, it is the responsibility of the owner to ensure proper maintenance and repairs occur.

(2) The equipment used must conform with the following requirements:

	Accuracy	Resolution
Oxygen (O_2)	± 0.2%	0.1%
Pressure/Draft	±2	0.04" water column
Temperature	±0.5%	0.1^0F

An optional test using the following standards may be applied as provided in the following chart:

	Accuracy	Resolution
Carbon Monoxide (CO)	±2 ppm at 0.0 to 39.9 ppm ±5% at 40.0 to 500 ppm	0.1 ppm
Nitric Oxide (NO)	±5 ppm at 0-100 ppm ±5% 101-2000 ppm	1 ppm

(3) The following procedure must be followed in the use of the combustion analyzer:

(i) Set up the combustion analyzer per manufacturer's instructions. In uncontaminated air (outdoor) start the analyzer and allow unit to complete the zeroing process. Never allow the analyzer to zero in the breeching.

(ii) Verify that the combustion analyzer condensate/water trap plug/access is properly sealed, that there is no water in the water trap, and thermocouple tip is not touching the side of probe tube. The test and record measurement criteria must be provided on a form prescribed by the department.

§2-10

§2-11 Installation Design.

(a) *General considerations.* (1) All equipment and apparatuses, in addition to complying with the requirements of the department, must also meet the requirements of other agencies, such as the New York City Board of Standards and Appeals, the Fire Department of New York, and the New York City Department of Buildings. Compliance with any requirements of either New York State or federal rules and regulations that may be instituted and not covered here is required.

In the absence of any regulatory provisions, consideration must be given to recommendations published in the standards of nationally recognized organizations. These organizations include the American National Standards Institute, the American Society of Heating, Refrigerating and Air Conditioning Engineers, the American Society of Mechanical Engineers, the American Gas Institute, Underwriters' Laboratories, and the National Fire Protection Association, and the recommendations of equipment or apparatus manufacturers.

(2) The design engineer must estimate the heat demand before selecting a boiler or boilers. When application is made for an installation for a new structure or for a replacement boiler (when the boiler maximum heat input rating size is increased by more than 20 percent from the previously filed application of record), the analysis and calculations for estimating the heat demand must be submitted in a form acceptable to the department. This must be done in accordance with the procedures prescribed by the 2009 ASHRAE Fundamentals Handbook, or as required for the New York City Energy Conservation Code, as codified in Chapter 10 of Title 28 of the New York City Administrative Code, and as accepted by the department.

(3) For dual-fuel installations using #6 or #4 fuel oil as a back-up fuel for natural gas, design requirements set forth by the department must be followed. However, these installations must still meet the #2 fuel oil emission standards and must be held to the most recent performance requirements.

(b) *Fuel burners.* (1) An oil burner must be capable of atomizing the oil by properly mixing it with adequate combustion air. A gas-fired burner must be capable of mixing the gas with adequate combustion air.

(2) A new burner must be listed by UL, CSA Group, ETL, or any other national recognized testing laboratory that uses UL testing conditions and have their Listing Mark label.

(3) A new burner, except for atmospheric equipment, must have, integral with it, a fan which is capable of supplying all combustion air.

(4) A burner must be sized such that, when fired with a boiler, the fuel delivery rate is within 80 percent and 110 percent of the maximum heat input rating of the boiler.

(c) *Fresh Air Requirements.* (1) Provision must be made to provide a sufficient amount of air for proper combustion (to the oil-or natural gas-burning equipment room) and, in addition, a sufficient amount of bypass air necessary for the proper operation of a barometric damper when used. In addition, sufficient air must be provided to adequately ventilate the room and maintain the ambient temperature at safe and comfortable limits under normal conditions of use. In all cases a separate ventilation system must be provided independent of any other ventilation system.

(i) Mechanical ventilation must be designed such that 226 cfm @ 94°F is provided for each million Btu per hour for up to 30 percent excess combustion air. Larger fan capacities would be needed for installations operating with greater than 30 percent excess combustion air. In all cases, where the combustion air is not ducted directly from the outside to the burner air intake, the room in which the burning equipment is located must be maintained at a pressure not less than outside atmospheric pressure. Exhaust fans are acceptable for ventilation provided the net ventilation is greater than or equal to the amount required for combustion.

(ii) When mechanical ventilation is not utilized, the minimum requirement for combustion air entrance must be a louvered opening in a wall to the outside air. The louvered opening must have a net free area of 86 square inches for every one million Btu per hour (based on the maximum heat input rating) and must never be less than the average internal cross-sectional area of the chimney. In addition, the net free area of the louver must be increased in size equivalent to the opening of a barometric damper or dampers, when provided, for bypass air. When necessary, a subway type grate over a vault below the sidewalk may be permitted as long as the net free area requirement is met and suitable drainage facilities are provided. The net free area when the actual louver efficiency is unknown must be based on a maximum efficiency of 60 percent for both motorized and fixed metal single vane louvers and 50 percent for fixed metal double vane louvers. Where the efficiency of the louver can be demonstrated by the manufacturer to be greater than the above, the greater value may be used. The area of the louver is to be based on the inside frame dimensions and not the outside or nominal dimensions. The louver must be so constructed or suitably located or protected (i.e., cinder blocks, metal bars) so that it cannot be crushed or deformed since this would diminish the free area. Furthermore, any diminution of free area due to protective devices must be considered. Screening over louvers, if provided, must be not smaller than 1/4 inch mesh and must be readily accessible for cleaning.

(iii) When ducts are required to provide fresh air, they must meet the same minimum requirement for cross-sectional area as specified in subparagraph (ii) above. Note that a louver is not required where ducts are utilized to provide ventilation, although, consideration should be given to protective devices and any diminution of free area resulting from same. Access ports must be provided for the purpose of cleaning and observing conditions within the duct(s). All access ports must be ample size, but not less than 8 × 8 inches. A tight metal fitting cover must be provided for each port. All ports must be closed when not in use.

(A) Access ports for cleanout must be located to allow accessibility to all duct sections and must be placed at intervals to allow for safe and reasonable access to all sections of the breeching for the purposes of cleaning. The number of clean-outs must be determined by the configuration of the duct lay-out. Every duct must be provided with at least one access port for cleanout.

(B) Access ports for observation purposes must be provided within one diameter of all internal dampers.

(C) One access port may be used to serve both functions if suitably located.

(iv) Motorized louvers or motorized dampers in ducts must be provided, on installations where the maximum heat input rate of the boiler(s) is 7.0 million Btu per hour or greater which must close off the admission of combustion air during burner-off periods.

(2) Breeching must be installed so as to vent the combustion gases from the boiler to the chimney.

(i) Access ports must be provided for the purpose of cleaning and observing conditions within the breeching. All access ports must be of ample size but not less than 8 × 8 inches. A tight fitting metal cover must be provided for each port. All ports must be closed when not in use.

(A) Access ports for the cleanout of oil burning installations must be located to allow accessibility to all breeching sections and must be placed at intervals to allow for safe and reasonable access to all sections of the breeching for the purposes of cleaning. The number of clean-outs must be determined by the configuration of the breeching lay-out. Every breeching must be provided with at least one access port for cleanout.

(B) For short breeching runs (less than 15 feet in total), the barometric damper may be used as the clean-out port.

(C) Access ports for observation purposes must be provided within one diameter of all internal motorized damper locations.

(D) One access port may be used to serve both functions if suitably located.

(ii) The following should be considered when designing a new breeching:

(A) The equivalent inside diameter should normally be no smaller than the outlet of the boiler and should be sized on the basis of maintaining a flue gas velocity not greater than 30 feet per second.

(B) Breechings should be as short and straight as possible to prevent unnecessary draft losses (which may necessitate larger chimneys, induced draft fans, etc.).

(C) Breechings should be constructed so that changes in direction, shape and cross-sectional area are accomplished separately. All such changes should be accomplished as gradually as possible to eliminate turbulence with consequent adverse effects on available draft. If the width of breeching is greater than the inside width of the chimney, a contoured transition piece should be installed. The transition section should maintain the area of the breeching while altering its configuration so as not to exceed the chimney width.

(D) The breeching connection to the chimney should be such that it ends flush with the inside surface of the chimney.

(3) Chimneys must be designed and installed so as to vent the products of combustion to the atmosphere while at the same time avoiding a potential or actual nuisance. Chimneys must not be fitted with raincaps or covers of any kind.

(i) New chimneys or reconstructed chimneys must be of tight construction and must be provided with a cleanout chamber at the base. The chamber must have a horizontal cross-sectional area equal to that of the chimney and must be equipped with a tightly fitted metal door of ample size but not less than 8 × 8 inches. The bottom of the breeching must be located at least one chimney diameter above the base of the cleanout chamber. Factory-made chimneys and special gas vents must be installed per the manufacturer's specifications.

(d) *Control devices.* (1) A boiler must be provided with acceptable control device(s) so as to maintain the desired boiler output under all normal operating conditions to meet the minimum performance requirements described in section 2-08 of this title.

(2) A burner must be provided with acceptable control device(s) so as to maintain the desired fuel-air ratio under all normal operating conditions to assure complete and smokeless combustion.

(3) The burner control system must be permanently interlocked, unless the system is continuously staffed and supervised, with all ventilation fans, motorized louvers and dampers to prevent operation of the burner without the proper operation of the fan, louver, or damper. This must be accomplished with an air switch, or other approved means, to assure that the fan is operating or that the louver/damper has opened before the main fuel valve opens. This requirement does not prohibit operating fans and opening louvers or dampers for ventilation purposes during periods when the burner(s) are not in operation, although continuous, uninterrupted operation of the fan, independent of the burner, must not be permitted except for existing central ventilation systems.

(4) Provision must be made, concerning the burner fan, to cause minimum pre-purge and post-purge periods as recommended by the burner manufacturer to prevent accumulation of unburned oil.

(e) *Draft Regulators*. (1) All installations must be designed such that an adequate draft can be maintained to provide sufficient combustion air and remove the products of combustion under normal conditions of use or when the outside temperature varies between 11°F and 94°F.

(2) Power operated draft regulators must be of an acceptable type designed to maintain a safe damper opening at all times and arranged to prevent starting of the burner unless the damper is opened to a safe position. The damper must be sized so that it comprises the full cross-sectional area of the breeching with appropriate allowances for clearance. Upon shut-down of the burner the damper must go to a safe closed position. The axis-rod (i.e., control rod) about which the damper rotates must have a square cross section or if round, must be welded to the control arm. An arrow must be provided on the axis-rod to indicate the position of the damper.

(3) Draft sensing lines must be a minimum of 1 1/4 inch pipe size, installed through the furnace wall, provided with a full size cleanout plug, and must otherwise conform to the equipment manufacturer's specifications. Details concerning the length and diameter of the draft sensing lines must be shown on the plans or specified in the plan notes.

(4) Barometric dampers must be of an acceptable type designed so as to provide a constant draft at a point directly upstream of the barometric damper under all normal operating conditions or when the outside temperature varies between 11°F and 94°F. However, in no case under steady state conditions must a pressure exist in the breeching at the barometric damper which is greater than the boiler room pressure. The minimum cross-sectional opening of the barometric damper must be at least as large as the diameter or equivalent diameter of the breeching to which it is connected.

(5) A draft control must not be required where an acceptable boiler assembly is designed and installed according to the manufacturer's requirements, and a positive pressure exists at a location in the chimney within three diameters of the chimney outlet.

(6) A boiler must be provided with acceptable control device(s) so as to maintain adequate draft (positive or negative as required) necessary for proper gas flow both to supply sufficient combustion air and exhaust combustion gases under all normal load and atmospheric conditions.

(i) A separate draft control must be provided for each boiler and be of the same type and must be installed per the manufacturer's specifications.

(ii) Draft control must be accomplished by a power operated draft regulator with low-draft cut-off. A barometric damper may be substituted for a power operated draft regulator if

(A) an on-off or low-high-off with low-fire start combustion controller is used or

(B) a forced draft burner is used.

(7) Oil-fired equipment, including dual-fuel installations, must be provided with a smoke alarm and combustion shutoff. This equipment must conform to the following specifications as well as applicable sections of the Air Pollution Control Code:

The requirements of the above paragraph must not apply to a temperature controlled dual-fuel system (as set forth below) when the maximum heat input rate is less than 4.2 million Btu per hour.

A temperature controlled dual-fuel system must comprise a fuel burning installation capable of burning natural gas and #2 fuel oil. The system must be designed and must operate such that the fuel burned will normally be gas except that when the outdoor temperature drops below 20°F, the equipment will automatically switch to #2 fuel oil and when the outdoor temperature rises above 25°F, the equipment will automatically return to natural gas operation.

(i) The smoke alarm must be regulated for both brightness intensity of the light source and sensitivity of the detector. It is recommended that the light source have a relatively uniform intensity over a reasonably long life.

(ii) The smoke alarm must cause both an audible (loud enough to be heard 20 feet from the source) and readily visible (a flashing red light) signal upon the emission of an air contaminant of an opacity of 20 percent or greater.

(iii) The smoke alarm must activate an additional signaling device located at the principal work location of the person supervising the equipment. If there is no principal work location, the additional signaling device must be located at an acceptable alternate location outside the boiler room.

(iv) The smoke alarm must cause the signaling devices to be activated in the event that the light source in a photoelectric type detector fails to operate properly. The signals must continue until the unit is manually reset.

(v) The smoke alarm must be provided with a suitable metal grid or equivalent, which meets the manufacturer's recommendations, calibrated so that when placed in the light path of the detector it will cause a response equivalent to an air contaminant as described in subparagraph (ii) above. This calibration must be indicated on the grid holder or frame. This grid must be securely fastened by means of a welded link chain of suitable length to the body of the detector. Provision must be made to temporarily hang the grid in front of the sensing element of the detector to facilitate proper adjustment of the light source and calibration of the instrument.

(vi) The installation of the smoke alarm must be such that

(A) it is wired to function at all times and

(B) it includes means necessary for sealing the breeching to prevent blowout of combustion products when necessary.

(vii) If two or more units of equipment are connected to a single flue, one air contaminant detector may be used if installed to monitor all of the units. This arrangement, however, will result in the shut-down of all units of equipment upon activation of the combustion shutoff.

(viii) The combustion shutoff automatically halt the operation of equipment within two minutes of continuous emission of an air contaminant of a density which appears as dark or darker than 20 percent opacity, unless the system is continuously staffed and supervised. The combustion shutoff must be designed such that once it has been activated, the equipment cannot resume normal operation without manual reset.

§2-12

§2-13 Determination of Acceptable Location of Chimney Outlet.

Several factors affect the location of the chimney outlet including the need to avoid a potential or actual nuisance. The following applicable requirements must be met.

(a) For all new installations (new building or new chimney):

(1) The chimney must extend above all construction such as roof ridge, parapet wall, penthouse, roof tank, elevator enclosure, etc., as follows:

(i) Chimneys must extend at least 3 feet above said construction located within 10 feet of the chimney outlet.

(2) The chimney outlet must not be located within the minimum radial distance specified in Table II.

(b) For existing installations:

(1) The chimney must extend at least as high as all construction such as roof ridge, parapet wall, penthouse, roof tank, elevator enclosure, etc., within 10 feet of the chimney outlet.

(2) The chimney outlet must not be located within the minimum radial distance specified in Table II.

Such requirement must apply to receptors which are at a height equal to or greater than the chimney outlet.

For receptors located below the chimney outlet, the chimney outlet must not be located within the minimum radial distance specified in Table II. In those instances where the above is applicable, the following statement must be provided as a plan note in place of the statement required in §2-04(c)(1)(vi):

"The minimum radial distance from the centerline of the existing chimney to an acceptable receptor location (a) located at a height equal to or greater than the chimney outlet is ____ft. and (b) located below the chimney outlet is ____ft.," with the distance specified.

(c) Whenever a building is erected, enlarged, or increased in height so that any receptor location in such building is within the minimum radial distance, as specified in Table II, of any previously constructed chimneys, the owner of such new or altered building must have the responsibility of altering such chimneys to make them conform with subdivision (a) of this section above. This must not apply to chimneys no longer connected to combustion equipment.

(d)(1) The criteria employed in determining stack heights and chimney outlet to receptor distance in this section must only apply to off-site receptors.

(2) Receptors, sources and geometry with the following features will be considered on-site and not subject to section 2-13 of this chapter.

(i) A single boiler stack servicing a single building structure.

(ii) Contiguous construction (i.e., attached "row" houses).

(iii) Separate entrances with separate addresses all serviced by the same boiler room.

(3) This section will be applied to existing facilities to the maximum extent possible consistent with good engineering practices. Alternative and less costly options to altering the stack should be permitted if it can be shown that this will not cause degradation of boiler performance. Degradation of boiler performance would increase air pollutant emissions or inhibit compliance with boiler upgrading criteria.

(4) For new and existing chimneys, emission impacts upon sensitive receptors including, but not limited to, windows, doors that open, people, and building fresh air intakes must be minimized by employing good air pollution control engineering practices. Such practices include, without limitation:

(i) Avoiding locations that may be subject to downwash of the exhaust; and

(ii) Installing stacks of sufficient height in locations that will prevent and minimize flue gas impacts upon sensitive receptors.

(5) Since this chapter's tables were developed using assumed average meteorological conditions in New York City, situations being disputed may be resolved by the submission of individualized computations of pollutant concentration at the receptor using realistic and applicable factors in dispersion models recommended and approved by the New York State Department of Environmental Conservation and the federal Environmental Protection Agency. The modeling must show that National Ambient Air Quality Standards will not be exceeded at any sensitive receptors, including openable windows and fresh air intakes. The tests, modeling, analysis and costs for these study(s) must be the responsibility of the applicant.

§2-14

§2-15 Performance Standards for the Continued Use of #4 Oil and #6 Oil in Heat and Hot Water Boilers.

(a) *General Provisions.* (1) The commissioner will not issue a work permit or a certificate of operation for a boiler and/or burner that uses #4 oil or #6 oil unless (i) the applicant demonstrates to the satisfaction of the commissioner that the particulate matter and NOx emissions of the #4 oil and/or #6 oil meets the equivalency standards described in this section, or

(ii) the applicant enters into a compliance agreement with the commissioner as provided in this section.

(2) An owner who holds a certificate of operation for a boiler and/or burner that uses #4 oil may file an amendment to convert the boiler and/or burner to use #2 oil and/or natural gas. An owner who holds a certificate of operation for a boiler and/or burner that uses #6 oil may file such an amendment to convert the boiler and/or burner to use #2 oil, #4 oil and/or natural gas. An amendment pursuant to this paragraph must not require the replacement of a boiler and/or burner.

(3) The commissioner will not approve any amendment for a previously issued work permit or certificate of operation to convert a boiler and/or burner from using #2 oil, #4 oil and/or natural gas to using #6 oil or from using #2 oil and/or natural gas to using #4 oil.

(4) The equivalency levels of particulate matter and NOx as set forth in this section must be demonstrated through (i) the submission by either a professional engineer or registered architect licensed under Education Law §§7202 or 7302 of detailed calculations and supporting documentation to verify the equivalency levels or (ii) the submission by the applicant of an equivalency form published by the department that provides for calculations based on fuel use, energy values and emission factors from AP-42.

(5) Notwithstanding any other provision in this section, the commissioner will not issue a work permit or a certificate of operation for a boiler and/or burner that uses #2 oil, #4 oil, #6 oil and/or natural gas unless the particulate matter and NOx emissions of such boiler or burner meets any binding emissions standard established by either state or federal law or regulation.

(6) Nothing in this section may be interpreted as requiring the New York City Department of Housing Preservation and Development, when conducting an emergency repair in accordance with sections 27-2125 through 27-2129 of the New York City Administrative Code, to convert a boiler and/or burner to use different fuel or to replace a boiler and/or burner with a boiler and/or burner that uses a different fuel.

(b) *Existing Boilers (Renewal).* (1) The commissioner may issue a renewal of a certificate of operation for a boiler and/or burner that uses #2 oil, #4 oil and/or natural gas in accordance with §24-122(d) of the New York City Administrative Code.

(2) The commissioner will not issue a renewal of a certificate of operation for a boiler and/or burner that uses #6 oil, unless (i) the applicant demonstrates to the satisfaction of the commissioner that the particulate matter and NOx emissions of the #6 oil to be used in such boiler and/or burner will be equivalent to or less than emissions from #4 oil as provided in paragraph 4 of subdivision (a) of this section, or (ii) the applicant enters into a compliance agreement with the commissioner in accordance with subdivision (e) of this section.

(3) An owner who holds a certificate of operation for a boiler and/or burner that uses #2 oil, #4 oil, #6 oil and/or natural gas, and who seeks to make an in-kind replacement for use with #2 oil, #4 oil and/or natural gas is not required to file a new application for a work permit and a subsequent certificate of operation. The owner must provide on a form to be designated by the commissioner the make, model and serial number of the replacement equipment. The previously issued certificate of operation may be renewed with the previously issued application number assigned by the department upon approval of the amendment by the department.

(4) An owner who holds a certificate of operation for a boiler and/or burner and who seeks to replace the boiler and/or burner with equipment that is not of the same make and model number must file a new application for a work permit and a subsequent certificate of operation as provided in section 2-04 of this chapter. The previously issued certificate of operation for the previously installed equipment will be cancelled upon receiving the application. The department will not accept an amendment to the previously issued certificate of operation for such replacement of the equipment.

(c) *New Installations (Replacement).* (1) All applications for a work permit for a boiler and/or burner must specify that the equipment uses #2 oil and/or natural gas, unless the applicant demonstrates to the satisfaction of the commissioner that the particulate matter and NOx emissions of the #4 oil and/or #6 oil to be used in such boiler and/or burner will be equivalent to or less than the emissions from #2 oil as provided in paragraph 4 of subdivision (a) of this section.

(2) In cases where a work permit has been issued before the effective date of this rule for a boiler and/or burner that uses #4 oil or #6 oil, but where a certificate of operation has not yet been issued, the owner of the equipment must file an amendment specifying the use of #2 oil and/or natural gas, unless the owner demonstrates to the satisfaction of the commissioner that the particulate matter and NOx emissions of the #4 oil and/or #6 oil to be used in such boiler or burner will be equivalent to or less than the emissions from #2 oil as provided in paragraph 4 of subdivision (a) of this section.

(d) *Sunset Provision.* Notwithstanding any other provision in this section, after January 1, 2030, all applications for a certificate of operation for a boiler and/or burner must specify that the equipment uses #2 oil and/or natural gas, unless (i) the applicant demonstrates to the satisfaction of the commissioner that the particulate matter and NOx emissions of the #4 oil or #6 oil to be used in such boiler and/or burner will be equivalent to or less than emissions from #2 oil as provided in paragraph 4 of subdivision a of this section, or, (ii) the applicant is an owner of fifty or more buildings with boilers or burners that use #4 oil or #6 oil, and enters into a compliance agreement with the commissioner in accordance with subdivision (e) of this section.

(e) *Compliance Agreements.* (1) A compliance agreement entered into under subdivisions b and d of this section must include a schedule agreed to by the commissioner for the conversion and/or replacement of boilers and/or burners, and/or demonstration of the required equivalency, until the owner is in full compliance with the provisions of this section.

(2) An owner who applies to enter into a compliance agreement must show that conversion and/or replacement of the boilers and/or burners, and/or demonstration of the required equivalency, within the time frames set forth in subdivisions b or d of this section for an owner of fifty or more buildings with boilers and/or burners that use #4 or #6 oil, or subdivision b of this section for an owner of fewer than fifty such buildings, would not be feasible or would constitute an undue hardship.

(3) For purposes of paragraph 2 of this subdivision, the commissioner will consider several factors in considering whether to enter into the compliance agreement. These factors include financial hardship, whether the owner is an equity owner of the buildings, the presence of underground tanks that must be remediated because of the conversion in subdivision (b) of this section, prior good faith efforts to comply, the scale and timing of commitments to convert to the cleanest fuels, the levels of particulate matter and NOx emitted by the boilers, whether the

boilers are located in neighborhoods with high densities of boilers that use #4 oil or #6 oil, and the public health consequences of delayed compliance with this section.

(4) An application to enter into an agreement to comply with subdivision (b) of this section must be filed by January 1, 2013, or the expiration date of the certification of operation in effect at the time of the effective date of this section, whichever is sooner.

(5) An application to enter into an agreement to comply with subdivision (d) of this section must be filed by January 1, 2020.

(6) An application filed according to this subdivision must be sent to:

Director of the Division of Air and Noise Programs, Enforcement and Policy
Bureau of Environmental Compliance
New York City Department of Environmental Protection
59-17 Junction Blvd.
Flushing, NY 11373

(7) The commissioner will publish in the City Record a written opinion no later than seven days after entering into a compliance agreement, stating the facts and reasons leading to his or her decision, as well as a copy of the compliance agreement.

(8) By December 31, 2014, and every year thereafter, the commissioner will publish a report summarizing the number of compliance agreements applied for and granted. The report will also summarize the environmental impacts of such compliance agreements and the overall program on tons of particulate matter and NOx in the air.

(9) Notwithstanding this specific compliance provision, Section 24-110 of the New York City Administrative Code may apply.

Appendix

Table I. ΔDr/H Values for Temperature Range of 1°F to 94°F

TEMP (°F)	Dr/H	TEMP (°F)	Dr/H	TEMP (°F)	Dr/H	TEMP (°F)	Dr/H
1	0.00284	26	0.00192	51	0.00114	76	0.00044
2	0.0028	27	0.0019	52	0.00112	77	0.000423
3	0.0027	28	0.00184	53	0.00108	78	0.0004
4	0.00266	29	0.00182	54	0.00105	79	0.00036
5	0.00263	30	0.00178	55	0.00102	80	0.00034
6	0.0026	31	0.00176	56	0.001	81	0.00032
7	0.00256	32	0.00172	57	0.00096	82	0.0003
8	0.0025	33	0.0017	58	0.00094	83	0.00026
9	0.00248	34	0.00166	59	0.00091	84	0.00024
10	0.00244	35	0.00162	60	0.0009	85	0.00021
11	0.00242	36	0.0016	61	0.00086	86	0.0002
12	0.0024	37	0.00156	62	0.000882	87	0.00018
13	0.00234	38	0.00154	63	0.0008	88	0.00012
14	0.0023	39	0.0015	64	0.00076	89	0.0001
15	0.00226	40	0.00148	65	0.00075	90	0.00009
16	0.00222	41	0.00146	66	0.0007	91	0.00006
17	0.0022	42	0.00142	67	0.00068	92	0.00004
18	0.00216	43	0.00138	68	0.00066	93	0.00002
19	0.00214	44	0.00136	69	0.00062	94	0
20	0.00212	45	0.00132	70	0.0006		
21	0.00208	46	0.0013	71	0.00058		
22	0.00204	47	0.00126	72	0.00054		
23	0.002	48	0.00122	73	0.00052		
24	0.00196	49	0.0012	74	0.0005		
25	0.00194	50	0.00118	75	0.00046		

Table II. Minimum Radial Distance Based Upon Chimney Diameter

Chimney Diameter [1]	Existing #2 Oil and Natural Gas Chimney		New Chimney[3]		Chimney Diameter	Existing #2 Oil and Natural Gas Chimney		New Chimney	
(in)	Existing Above (ft)	Existing Below (ft)	#2 Oil (ft)	Natural Gas (ft)	(in)	Existing Above (ft)	Existing Below (ft)	#2 Oil (ft)	Natural Gas (ft)
6	7.9	5.8	13.3	10.6	29	44.4	32.8	64.3	51.4
7	9.4	6.9	15.5	12.4	30	46.1	34.0	66.5	53.2
8	10.8	8.0	17.7	14.2	31	47.8	35.3	68.7	55.0
9	12.3	9.1	19.9	16.0	32	49.4	36.5	70.9	56.7
10	13.8	10.2	22.2	17.8	33	51.1	37.8	73.1	58.5
11	15.3	11.3	24.4	19.5	34	52.9	39.1	75.3	60.3
12	16.8	12.4	26.6	21.3	35	54.5	40.3	77.5	62.1
13	18.4	13.6	28.8	23.0	36	56.2	41.6	79.8	63.8
14	20.0	14.8	31.0	24.8	37	57.9	42.8	82.0	65.6
15	21.6	15.9	33.2	26.6	38	59.7	44.1	84.2	67.4
16	23.2	17.1	35.4	28.3	39	61.4	45.4	86.4	69.1
17	24.7	18.3	37.7	30.1	40	63.1	46.7	88.6	70.9
18	26.3	19.5	39.9	31.9	41	64.7	47.8	90.8	72.7
19	27.9	20.6	42.1	33.6	42	66.6	49.2	93.1	74.5
20	29.5	21.8	44.3	35.4	43	68.4	50.5	95.3	76.2
21	31.2	23.0	46.5	37.2	44	70.1	51.8	97.5	78.0
22	32.8	24.2	48.7	38.9	45	71.8	53.1	99.7	79.8
23	34.4	25.4	51.0	40.7	46	73.6	54.4	101.9	81.6
24	36.1	26.7	53.2	42.5	47	75.3	55.7	104.1	83.3
25	37.7	27.9	55.4	44.3	48	77.1	57.0	106.3	85.1
26	39.4	29.1	57.6	46.1	49	78.9	58.3	108.6	86.9
27	41.0	30.3	59.8	47.9	50[2]	80.6	59.6	110.8	88.7
28	42.7	31.5	62.0	49.6					

[1]The diameter must be taken as the diameter or equivalent diameter at the outlet of the chimney. The term "equivalent diameter" means the equivalent diameter of a square or rectangular section based on equal area.

[2]For diameters larger than 50 inches, the minimum radial distance will be provided by the department upon request.

[3]The minimum radial distance in feet for new #2 oil chimneys and natural gas chimneys was determined using the formula $d = F \times \sqrt{A}$, where F is 2.5 for #2 oil and 2 for natural gas and A is the cross sectional area of the chimney outlet in square inches.