

10/15/08 FINAL

EPA Hydronic Heater Program

Phase 2 Partnership Agreement

between the

Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency

and

Purpose

This Partnership Agreement (Agreement) is a voluntary commitment between _____ (Partner) and the Office of Air Quality Planning and Standards (OAQPS), United States Environmental Protection Agency (EPA), by which Partner agrees to participate in Phase 2 of the EPA Hydronic Heater Program. The primary purpose of the Program is to promote the manufacture and sale of cleaner hydronic heaters over other hydronic heater models, unless prohibited by law or by regulation. EPA is not promoting the sale of hydronic heaters over other heating devices.

This Agreement sets out the commitments Partner agrees to make as part of its participation in this voluntary program. It does not impose any legally binding obligations on EPA, nor is EPA imposing any legally binding obligations on Partner through this Agreement.

Background

In January 2007, EPA and manufacturers of outdoor wood-fired hydronic heaters (OWHH) initiated Phase 1 of the EPA Outdoor Wood-fired Hydronic Heater Program to encourage the development and market availability of new, cleaner OWHH models. As of October 15, 2008, the Phase 1 Program has been terminated, and the Phase 2 Program has begun. The Phase 2 Program includes hydronic heaters that can burn biomass material other than wood (e.g. corn, pellets, etc.) in addition to OWHH. It also includes hydronic heaters that are designed for indoor use, and hydronic heaters that are equipped with heat storage units. Due to this expansion of the Program's scope, the Program name is broader in the Phase 2 Program (EPA Hydronic Heater Program) than it was in its initial phase (EPA OWHH Program).

The Program is still aimed at reducing emissions from new hydronic heaters sooner than could be achieved by Federal regulation. The Phase 1 Program included an average air emission level of 0.60 pounds of fine particles per million Btu (lb/MMBtu) heat input as a goal. This Phase 1 emission level was considered to be a first step in a two-phased program, with Phase 2 including a lower emission level, to be identified later. Twenty OWHH manufacturers became partners with EPA, and 10 models were qualified during the Phase 1 Program.

The Phase 1 Program was terminated and the Phase 2 Program was initiated by EPA on October 15, 2008. As of that date, hydronic heater manufacturers were invited to join/rejoin the Program by signing this Phase 2 Partnership Agreement with EPA. The Phase 2 Program includes an average air emission level of 0.32 lbs/million Btu heat output, where no individual test run that is used in the calculation of the average exceeds 18.0 grams of fine particles per hour.

As part of the Phase 2 Program, models qualified to meet the Phase 1 average emission level (0.60 lbs/MMBtu heat input) will continue to qualify as a “qualified model” until March 31, 2010. (Note that Phase 1 qualification may be either for use only during the heating season and/or for year round use, based on use of Table 2A or 2B in EPA Method 28 OWHH, see Partnership Agreement Attachment 2. Some local agencies/states may restrict the use of models that are qualified only for use during the heating season). After March 31, 2010, models that achieve the 0.60 lbs/MMBtu heat input average emission level, but that do not achieve the 0.32 lbs/MMBtu heat output average emission level with 18.0 grams of fine particles per hour cap will no longer be considered “qualified models” under the Program.

The Model Rule developed by Northeast States for Coordinated Air Use Management (NESCAUM) includes the 0.32 lbs/MMBtu heat output average emission level as the appropriate level for states and local agencies to ultimately adopt to regulate fine particles from new hydronic heaters. EPA provided technical and financial support for the development of the Model Rule, which became available in January 2007 (<http://www.nescaum.org/topics/outdoor-hydronic-heaters>). Since then, Vermont and Maine have promulgated new regulations for hydronic heaters, and other states are currently developing hydronic heater regulations. Several states also regulate hydronic heaters via requirements related to fuel combustion.

Definitions

For purposes of this Phase 2 Agreement:

- a hydronic heater is a fuel-burning device which may be equipped with a heat storage unit, and which is designed to (1) burn wood or other biomass (as defined below); (2) be installed according to the manufacturer’s specifications either indoors or outdoors; and (3) heat building space and/or water via the distribution, typically through pipes, of a fluid heated in the device, typically water or a water/antifreeze mixture. “Hydronic heater” for purposes of this Program does not include models that are either (1) generally too large for manufacturers’ or laboratories’ scales, or (2) commercial models (i.e. models that generate 350,000 Btu/hr heat output or more). It also does not include forced air furnaces.
- “other biomass” refers only to automatically fed fuels such as wood pellets, shelled corn, and wood chips.
- “heat storage unit” refers to sufficient thermal storage capacity to safely accept the entire heat output of a full fuel load without heat draw-off, without overheating, and without activating any safety controls provided with the heater.

For testing purposes, sufficient thermal storage must be provided by the manufacturer to allow a 4-hour carryover between firings when providing the maximum rated heat output.

- a “qualified model” is any Phase 1 emission level qualified model and any Phase 2 emission level qualified model until March 31, 2010 (assuming the manufacturer and EPA have signed a Phase 2 Partnership Agreement). After March 31, 2010, a “qualified model” is any Phase 2 emission level qualified model. Note that models that qualified during the Phase 1 Program based on testing by the ASTM cordwood test method exemption will no longer be qualified as of December 31, 2008. In addition, Program use of qualifying labels and hangtags on these models must be discontinued on units manufactured after December 31, 2008. The qualification of Phase 2 emission level qualified models will end 5 years after the date of the EPA letter acknowledging qualified status; the manufacturer may choose to requalify the model per the Program qualifying process, or may seek a waiver (see Partnership Agreement Attachment 1).
- a “Phase 1 emission level qualified model” is a model that achieves an average emission level of 0.60 lbs/million Btu heat input or less for all fuel types listed in the owner’s manual and/or mentioned in marketing/sales materials, as acknowledged by EPA in writing to the Partner.

Such models qualify for use of the Phase 1 emission level qualifying label and hangtag until March 31, 2010. After March 31, 2010, Phase 1 emission level qualified models will no longer be considered “qualified” under the Program, and use of Program permanent labels and hangtags for these models must be discontinued on units manufactured after that date.

Any model that achieved an average emission level of 0.60 lbs/million Btu heat input based on testing according to EPA Method 28 OWHH during the Phase 1 EPA OWHH Program will automatically be considered a Phase 1 emission level qualified model under this Phase 2 EPA Hydronic Heater Program once both EPA and the manufacturer sign a Phase 2 Partnership Agreement.

Models that qualified during the Phase 1 EPA OWHH Program based on testing by the ASTM cordwood test method exemption will no longer be considered qualified under the Program as of December 31, 2008, and use of Program labels and hangtags must be discontinued on units manufactured after that date.

- a “Phase 2 emission level qualified model” is a model that achieves an average emissions level of 0.32 lbs/million Btu heat output or less for all fuel types listed in the owner’s manual and/or mentioned in marketing/sales materials, and that did not exceed 18.0 grams/hr of fine particles in any individual test run that was used in the calculation of the average, as acknowledged by EPA in writing to the Partner.

Qualification of Phase 2 emission level qualified models will end 5 years after the date of the EPA letter acknowledging qualified status and use of Program and use of Program permanent labels and hangtags on these models must be discontinued for units manufactured after that date. Partner may choose to re-qualify a model per the Program qualifying process, or may seek a waiver (see Partnership Agreement Attachment 1).

Any model that achieved an average emission level of 0.32 lbs/million Btu heat output and that did not exceed 18.0 grams/hr of fine particles in any individual test run that was used in the calculation of the average based on testing according to EPA Method 28 OWHH during the Phase 1 EPA OWHH Program will automatically be considered a Phase 2 emission level qualified model under this Phase 2 EPA Hydronic Heater Program once both EPA and the manufacturer sign a Phase 2 Partnership Agreement.

Models that qualified during the Phase 1 EPA OWHH Program based on testing by the ASTM cordwood test method exemption will no longer be considered qualified under the Program as of December 31, 2008, and Program label and hangtag use must be discontinued on units manufactured after that date.

General Commitments

Partner and EPA should each designate a single liaison point for Phase 2 of the Program, and should notify one another within two weeks of any change in liaison identity or responsibilities. All relevant correspondence (including the original, signed Partnership Agreement (Agreement)) should be sent to these designated liaisons.

Partner Commitments

The Partner commits to use its best efforts to develop, manufacture, and market one or more qualified models. To this end, the Partner agrees to:

- adhere to the terms of this Agreement, including the Program guidelines which are provided as attachments to this Agreement, i.e.
 - Qualifying Process (Attachment 1), describes the process that Partners will follow to achieve “Phase 1 emission level qualified model” or “Phase 2 emission level qualified model” status for their model(s).
 - Test Guidelines (Attachment 2), provides the methods by which models will be tested under this phase of the Program. EPA Method 28 OWHH will be used for testing indoor and outdoor hydronic heaters using wood (in cribs per the method) as the fuel. Relevant sections from ASTM method E2618-08 will be used for testing continuously fed biomass fuels. Models equipped with heat storage units (see definition in Background section above) will be tested per Appendix A of ASTM method E2618-08, except wood in cribs will be used as the fuel rather than cordwood as specified in the method. Partner and EPA recognize that these

test guidelines are relatively new, and that issues may surface during their use. Partner and EPA agree to work together in good faith to resolve any such issues.

- Guidelines for Use of Labels, Hangtags, and Outreach Materials (Attachment 3), provides format and other specifications for the qualifying labels and hangtags, and describes the appropriate use of the qualifying labels, hangtags, and outreach materials.
- test each fuel type (e.g. wood (in cribs per EPA Method 28 OWHH), corn pellets, etc.) that the manufacturer's owner's manual or sales/marketing information says the model can burn for all model lines that Partner is seeking to qualify under this Program, and for all model lines that collectively represent the top 25% of Partner's total hydronic heater sales over the past two years. In order to qualify a model under this Program, tests for all fuel types must indicate either an emissions level of 0.60 lbs/MMBtu heat input or less (until March 31, 2010) or an emissions level of 0.32 lbs/MMBtu heat output or less, within the 18.0 grams/hour cap (after March 31, 2010) in order to become qualified as a "Phase 1 emission level qualified model" or a "Phase 2 emission level qualified model" under this Program.

The owner's manual for each qualified model should only recommend burning fuels that have been tested. Similarly, sales/marketing information for each qualified model should only recommend burning fuels that have been tested.

For multiple fuel continuously fed models that qualify for wood-derived fuels (e.g., pellets, chips, sawdust) via the ASTM continuously fed test method, the test for each additional fuel may be reduced from four runs to two, provided that the two runs are for the maximum burn rate and for the burn rate shown by the ASTM continuous feed test method for wood to have the highest emissions per Btu of the remaining three burn rates. If the model is not to be fueled by wood, then the manufacturer should specify which biomass fuel is the primary fuel and if the model qualifies on that fuel, then the tests for the additional fuel(s) may be reduced from four runs to two, provided that the two runs are for the maximum burn rate and for the burn rate shown by the ASTM continuous feed test method for the primary fuel to have the highest emissions per Btu of the remaining three burn rates. The results should be reported for each run separately and as an arithmetic average (i.e., not using the year-round weightings).

- report the particulate emissions test information, as listed below. Partner will submit the test report showing that a qualified lab used the appropriate Program test method for each model line that Partner is seeking to qualify under this Program. Partner should provide a complete test report consisting of all test documentation such as:
 - raw data,
 - laboratory technician notes,
 - calculations sheets,

- design information (e.g. CAD drawings, perspective drawings, operational drawings showing air, water, and smoke flow paths), and
 - test results.
- report the particulate emissions test information, as listed below, for at least one test report per model for all model lines not offered for qualification, which collectively represent the top 25% of Partner's total hydronic heater sales over the past two years (i.e. not just models for which qualification under this Program is sought). This information may be from tests conducted by any entity, including tests conducted by Partner at Partner's own facility.

Where test information already existed for a model as of October 15, 2008, it should be submitted to EPA within 3 months of Partner signing the Partnership Agreement regardless of whether a Program test method was used in generating the information. Where test information did not yet exist for a model as of October 15, 2008, tests should be conducted via the appropriate Program test method(s) and results should be submitted to EPA as soon as they are available, but no later than 18 months of Partner signing the Partnership Agreement.

For tests which did not indicate an emissions level of 0.60 lbs/million Btu heat input or less, or which were not conducted via a Program test method, or which were not conducted at an independent laboratory as described in Attachment 1, Partner should provide a summary of each test consisting of:

- the date of each test,
- test method(s) used,
- model number or name,
- name of the facility that performed each test,
- thermal output rating in MMBtu/hr,
- result of emissions testing expressed in terms of lbs/MMBtu heat input, lbs/million Btu heat output, grams/hr/10,000 Btu heat output, and grams/hr,
- highest individual test run used in calculating the average emissions level in grams/hr, and
- overall input/output efficiency.

For tests which indicated an emissions level of 0.60 lbs/million Btu heat input or less, and which were conducted via a Program test method, and which were conducted at an independent laboratory as described in Attachment 1, Partner should provide a complete test report for each test consisting of all test documentation such as:

- raw data,
- laboratory technician notes,
- calculations sheets,
- design information (e.g. CAD drawings, perspective drawings, operational drawings showing air, water, and smoke flow paths), and
- test results.

- identify information entitled to protection as confidential business information (CBI) under 40 CFR part 2 and other applicable law. Please note that emission data are generally subject to disclosure to the public per Clean Air Act section 114(c). See 40 CFR section 2.301(a)(2). Note also that it is important that state regulatory agencies and the public have access to sufficient information to enable them to confirm that the test calculations were performed correctly.
- call EPA Program liaison at least every 6 months to provide an informal status update regarding the development, manufacture, and marketing of cleaner models.
- provide certain sales information to the EPA Program liaison by April 30 and October 31 each year, starting in October 2008. Sales data during the period from October 1-March 31 should be reported in April each year, and sales data during the period from April 1-September 30 should be reported in October each year. Reports should include the following information:
 - the number of units of wood-burning Phase 1 emission level qualified models sold; also identify how many of these units were indoor models, and how many were models equipped with heat storage units,
 - the number of units of continuous feed biomass Phase 1 emission level qualified models sold; also identify how many of these units were indoor models, and how many were models equipped with heat storage units,
 - the number of units of wood-burning Phase 2 emission level qualified models sold; also identify how many of these units were indoor models, and how many were models equipped with heat storage units,
 - the number of units of continuous feed biomass Phase 2 emission level qualified models sold; also identify how many of these continuous feed biomass units were indoor models, and how many were models equipped with heat storage units, and
 - the total number of hydronic heater units (including both wood-burning (only) and other biomass-burning units) sold (includes Phase 1 emission level and Phase 2 emission level qualified models as well as models that do not qualify under the Program).

After March 31, 2010, information regarding Phase 1 emission level qualified models (i.e. the first two bullets above) does not need to be reported, given that these models will not be qualified models under this Program at that point.

EPA Responsibilities

EPA will undertake efforts to build awareness of the Program, ensure fair and technically sound underpinning of the Program, and promote the benefits of cleaner burning hydronic heaters over other hydronic heaters. To this end, EPA is responsible for:

- maintaining a website where Partners and EPA can furnish information on program efforts and where key EPA and Partner contacts are identified;¹

¹ Models that fail to qualify for Phase 2, but that have an average emissions level below 0.32 lbs/MMBtu heat output will be listed on this website.

- reviewing laboratory reports and responding to Partner regarding qualification status of submitted models in a timely manner;
- preparing a template for hangtags for use on qualified models;
- maintaining any confidential business information (CBI) submitted to EPA under this Agreement according to 40 CFR part 2 and other applicable law (emission data cannot be withheld from disclosure, however);
- releasing aggregated sales information as appropriate, as long as CBI is not revealed;
- making various Program materials such as the Qualifying Process document, test guidelines, Guidelines for Use of Labels, Hangtags, and Outreach Materials, and any outreach materials easily accessible through the Internet (www.epa.gov/woodheaters) and/or other means; and
- as appropriate, providing Partners with public recognition for their efforts as part of the Program.

Limitations

Partner agrees not to construe, claim, or imply that its participation in the EPA Program constitutes federal government approval, acceptance, or endorsement of anything other than Partner's commitment to the Program. Partner understands its participation in the Program does not constitute federal government endorsement of Partner or its products. Partner acknowledges that under 5 CFR Section 2653.702(c), EPA may not endorse the purchase or sale of commercial products and services provided by the Partner. The Partner agrees to ensure that outreach materials describing this Agreement include statements that EPA does not endorse any particular product, service, or enterprise.

Partner understands that the activities it undertakes in connection with the Program are voluntary and not intended to provide services to the federal government. As such, Partner will not submit a claim for compensation to any federal agency.

All commitments made by EPA in this Agreement are subject to the availability of appropriated funds and budget priorities. Nothing in this Agreement, in and of itself, obligates EPA to expend appropriations or enter into any contract, assistance agreement, interagency agreement, or incur other financial obligations. This Agreement does not exempt Partner from Agency policies requiring competition for financial assistance and contracts. Any endeavor involving EPA funding will be handled in accordance with applicable laws, regulations, policies and procedures, and will be subject to separate agreements.

This Agreement does not create any right or benefit, substantive or procedural, enforceable by law or equity against the Partner or EPA, their officers or employees, or any other person. This Agreement does not direct or apply to any person outside the Partner and EPA.

Dispute Resolution

Partner and EPA will assume good faith as a general principle for resolving conflicts under the Program. Both Partner and EPA will endeavor to resolve all matters informally, so as to preserve maximum public confidence in the Program.

In the event informal channels do not produce a mutually agreeable resolution to a matter in dispute, either Partner or EPA may notify the other in writing as to the nature of the dispute, the specific corrective action sought and their intent to terminate the Agreement unless specific corrective actions sought are undertaken.–

Effective Date and Duration of Agreement

This Agreement will become effective when signed by both Partner and EPA, and may be amended by mutual written agreement. Partner and EPA understand that this Agreement is wholly voluntary and may be terminated in writing by either Partner or EPA at any time and for any reason with no penalty. EPA may terminate the Agreement, including the authorization to use qualifying labels and hangtags if Partner fails to act in accordance with any part of this Agreement, including its attachments. Unless amended or terminated sooner, the terms of the Agreement will remain in effect until the termination of Phase 2 of the Program by EPA.

Signatures

The undersigned hereby execute this Partnership Agreement on behalf of their organization. The signatories affirm that they have the authority to execute this Agreement on behalf of Partner and EPA.

EPA Program Liaison:

Name: Gil Wood
Title: Environmental Engineer
Mailing Address: US EPA
OAQPS, Outreach and Information Division
Mail Code C304-05
Research Triangle Park, NC 27711
Overnight Delivery Address: US EPA
OAQPS, Outreach and Information Division
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4930 Page Road
Durham, NC 27703
Telephone: (919) 541-5272
Fax: (919) 541-2664
E-mail: wood.gil@epa.gov

Partnership Agreement Signatory for EPA:

Signature: _____ Date: _____
Name: _____
Title: _____

Partner Program Liaison:

Name:

Title:

Mailing Address:

Overnight Delivery Address:

Telephone:

Fax:

E-mail:

Partnership Agreement Signatory for _____

Signature: _____ Date: _____

Name:

Title:

Mailing Address:

City:

State:

Zip Code:

Country:

Telephone:

Fax:

E-mail:

Company web site:

Partnership Agreement Attachment 1

Qualifying Process

EPA Hydronic Heater Program, Phase 2

I. INITIAL PROCESS

- A. Partner should use an independent laboratory that is accredited for the woodstove new source performance standard (NSPS) (see 40 CFR 60.535) and has participated on at least one American Society for Testing and Materials (ASTM) technical subcommittee for residential wood heating appliances. EPA will consider other independent accredited laboratories on a case-by-case basis.
- B. Testing conducted with wood (in cribs) as the fuel should occur via use of EPA Method 28 OWHH (Partnership Agreement Attachment 2). If the model is equipped with a heat storage unit, testing should still use cribs as specified in EPA Method 28 OWHH and the heat input and heat output measurements should occur according to ASTM method E2618-08 entitled “Standard Test Method for Measurement of Particulate Emissions and Heating Efficiency of Outdoor Solid Fuel-fired Hydronic Heating Appliances” (ASTM method), Appendix A [once Appendix A is available in final form]. Testing conducted with continuously fed biomass as the fuel(s) should occur via use of the relevant section of the ASTM method.

Partner may additionally choose to test via the ASTM method using cordwood (as opposed to wood in cribs) where Partner has already determined that a model achieves a 0.32 lb/MMBtu emission level using EPA Method 28 OWHH. If EPA:

- (1) is provided with adequate data for a sufficient number of models to enable it to determine the difference between testing wood-burning models via EPA Method 28 OWHH and testing them via the ASTM method, and
- (2) has judged this difference to be not so great as to warrant testing via only the former method, then

EPA may indicate to Partner that it may test future models for which Phase 2 emission level qualification is sought via either one of the two methods, as opposed to testing via both methods. If this occurs, EPA would notify all Partners of this change in writing.

- C. Partner should send the complete laboratory test report, including all documentation (such as raw data, laboratory technician notes, calculations sheets, design information, and test results) to the EPA Program liaison. Recommended formats for these materials are available upon request from the EPA Program liaison. Partner should also send a statement indicating one of the following:

- a. the model meets the Phase 1 emission level for year round use (i.e., 0.60 lb/MMBtu heat input weighted average using Table 2B, Method 28 OWHH or the ASTM method for continuously fed biomass. For wood-burning models equipped with heat storage units, the test must be performed via EPA Method 28 OWHH (with cribs) with appropriate adjustments for heat input and heat output measurements and calculations via the ASTM method heat storage Appendix A. For continuously fed biomass models with heat storage units, the test should be via the ASTM method), AND/OR
 - b. the model meets the Phase 1 emission level for use only during the heating season (i.e., 0.60 lb/MMBtu heat input weighted average using Table 2A, Method 28 OWHH or the ASTM method for continuously fed biomass. For wood-burning models equipped with heat storage units, the test must be performed via EPA Method 28 OWHH (with cribs) with appropriate adjustments for heat input and heat output measurements and calculations via the ASTM method, Appendix A (heat storage). For continuously fed biomass models with heat storage units, the test should be via the ASTM method), OR
 - c. the model meets the Phase 2 emission level (i.e., 0.32 lb/MMBtu heat output weighted average using Table 2B, Method 28 OWHH or the ASTM method for continuously fed biomass or models equipped with heat storage units).
Phase 2 emission level qualified models will not be qualified for “heating season use only.”
- D. EPA will review Partner’s submission for completeness and determine if it contains any apparent discrepancies.
 - E. EPA’s Outreach and Information Division at the Office of Air Quality Planning and Standards intends to respond to Partner in writing and in a timely manner regarding qualification status once it has received a complete submission and all errors have been corrected.
 - F. If EPA acknowledges in its written response that the model meets the Phase 1 emission level (whether for year round use or for use during the heating season only), the model will be considered a “Phase 1 emission level qualified model” until March 31, 2010. If EPA acknowledges that the model meets the Phase 2 emission level, the model will be considered a “Phase 2 emission level qualified model.” In either case, Partner may then affix qualifying labels and/or hangtags to units in accordance with the Guidelines for Use of Label, Hangtag, and Outreach Materials (Partnership Agreement Attachment 3). If EPA’s response identifies a problem with Partner’s submission, EPA and Partner will work together to determine next steps, which may involve retesting. In such a case, Partner should not begin to use qualifying labels and/or hangtags until EPA acknowledges that the model meets either of the Program emissions levels.
 - G. Partner agrees to use Program qualifying labels or hangtags only as described in the Guidelines for Use of Label, Hangtag, and Outreach Materials (Partnership Agreement Attachment 3).

- H. Partner agrees to allow EPA access (with advance notice) to its manufacturing facility. EPA may compare units offered for sale with the unit that was tested to ensure that no design changes affecting emissions have occurred since testing, and/or may inspect the manufacturing process.
- I. Designation as a Phase 2 emission level qualified model will end five years after the date of the EPA letter acknowledging qualified status; Partner may choose to re-qualify the model per the Program qualifying process, or may seek a waiver of a new qualifying test. To request a waiver of re-qualification via the qualifying process, Partner should state in writing that, since the model's original qualification under the EPA Hydronic Heater Program, the model has not undergone any modifications that have the potential to increase emissions. Modifications that have the potential to increase emissions may include, among other things, changes in firebox dimensions, airflow rates, airflow direction, heat output, and pressure differential through the unit. As appropriate, EPA will approve waiver requests in writing. In addition, Partner should send updated design drawings along with its waiver request. The granting of such a waiver by EPA would not relieve Partner of its other commitments under the Partnership Agreement.

II. ENHANCED PROCESS

The highest levels of quality data are assured through the implementation of EPA's Environmental Technology Verification (ETV) Quality Management Plan which is compatible with both American and internationally accepted quality standards. ETV, which began in October 1995, operates through public/private testing partnerships to evaluate the performance of environmental technology that have the potential to improve protection of human health and the environment.

Our intention is to have the ETV process in place for purposes of the EPA Hydronic Heater Program by fall 2008. Once the ETV process is in place, Partner will use that process (paid for by Partner) for testing models and having the test reports reviewed prior to submittal to the EPA Program Liaison. Partner is not expected to use the ETV process for models that, prior to the ETV process being in place for the Program, have become EPA Hydronic Heater Program qualified models. Partner is also not expected to use the ETV process for models which it does not intend to qualify under the Program. For example, testing of these models via the Program test methods may occur at the manufacturer's own laboratory or at an independent laboratory that has not been accredited by ETV.

The following describes the process for test verification through the ETV program:

- A. Partner seeks testing and verification through the ETV Program; the ETV Program provides a list of accredited laboratories which may be used to conduct the testing, and the ETV Program verifies the test results.
- B. Testing should occur via use of EPA Method 28 OWHH and/or the ASTM method section for testing continuously fed biomass fuels or Appendix A for testing models equipped with a heat storage unit, except that wood-burning models equipped with a heat

storage unit should still be tested via wood in cribs via EPA Method 28 OWHH. The ETV Generic Verification Protocol is available on the ETV website at <http://www.epa.gov/nrmrl/std/etv/pubs/600etv08014.pdf>. The ASTM method E2618-08, including Appendix A, will be available for purchase in final form from ASTM on this website.

- C. Partner should send the complete laboratory test report, including all documentation (raw data, laboratory technician notes, calculation sheets, and test results) to the EPA Program liaison. The recommended format for this submission is provided in Section III below. Partner should also send a laboratory statement that the test was performed according to the ETV-formatted version of EPA Method 28 OWHH (for most wood-fired models, including indoor models) or the ASTM method (for models fueled by continuously fed biomass and models equipped with a heat storage unit), and Partner should make one of the three statements indicated in the “Initial Process” Section I.C. above.
- D. EPA will review Partner’s submission for completeness and to determine if it contains any discrepancies.
- E. EPA’s Outreach and Information Division at the Office of Air Quality Planning and Standards intends to respond to Partner in writing and in a timely manner regarding the qualification status of submitted model(s) once it has received a complete submission and all errors have been corrected.
- F. If EPA acknowledges in its written response that the model meets the Program Phase 1 emission level, the model will be considered a “Phase 1 emission level qualified model,” and Partner may choose to affix the Phase 1 emission level qualifying label and/or hangtag to pre-sale units in accordance with the Guidelines for Use of Label, Hangtag, and Outreach Materials (Partnership Agreement Attachment 3) until March 31, 2010. If EPA acknowledges in its response that the model meets the Program Phase 2 emission level, the model will be considered a “Phase 2 emission level qualified model,” and Partner may choose to affix the Phase 2 emission level qualifying label and/or hangtag to pre-sale units in accordance with the Guidelines for Use of Label, Hangtag, and Outreach Materials for five years (with the option of re-qualification). If EPA’s response identifies a problem with Partner’s submission, EPA and Partner will work together to determine next steps, which may involve retesting. In such a case, Partner should not begin to use the Phase 1 or Phase 2 emission level qualifying labels and/or hangtags until EPA acknowledges that the model meets the Phase 1 or Phase 2 emission level.
- G. Partner agrees to use Program qualifying labels and hangtags only as described in the Guidelines for Use of Label, Hangtag, and Outreach Materials (Partnership Agreement Attachment 3).
- H. Partner agrees to allow EPA access (with advance notice) to its manufacturing facility. EPA may compare units offered for sale with the unit that was tested to ensure that no design changes affecting emissions have occurred since testing, and/or may inspect the manufacturing process.

- I. Designation as a Phase 2 emission level qualified model will end five years after the date of the EPA letter acknowledging qualified status; Partner may choose to re-qualify the model per the Program qualifying process, or may seek a waiver of a new qualifying test. To request a waiver of re-qualification via the qualifying process, Partner should state in writing that, since the model's original qualification under the EPA Hydronic Heater Program, the model has not undergone any modifications that have the potential to increase emissions. Modifications that have the potential to increase emissions may include, among other things, changes in firebox dimensions, airflow rates, airflow direction, heat output, and pressure differential through the unit. As appropriate, EPA will approve waiver requests in writing. In addition, Partner should send updated design drawings along with its waiver request. The granting of such a waiver by EPA would not relieve Partner of its other commitments under the Partnership Agreement.

III. TEST REPORT FORMAT

The EPA Program liaison will provide a test report template upon request. Use of this template should facilitate review.

Partner should provide a complete version of its test report to EPA (and to ETV, once the ETV process is in place) when it is ready for verification of its results. The complete version should be provided in both hard copy and electronic form. Partner should clearly indicate which information is being claimed as confidential business information (CBI), if any, rather than assert a general CBI claim for the entire report. Clean Air Act section 114(c) indicates that emission data generally will not be protected (see 40 CFR section 2.301(a)(2)), whereas information which would divulge methods or processes entitled to protection as trade secrets will be protected.

Once verification is complete and all errors have been corrected, Partner should provide to the EPA Program liaison (and to ETV, once the ETV process is in place):

- a hard copy of the revised, complete test report if any changes were made to the original test report during the verification process,
- an electronic copy of the revised, complete test report if any changes were made to the original test report during the verification process,
- where the report contains CBI, a hard copy of the test report with all CBI removed, and
- where the report contains CBI, an electronic copy of the test report with any CBI removed.

IV. DISCONTINUATION OR MODIFICATION OF QUALIFIED MODELS

Partner is responsible for promptly informing EPA when any of its qualified models is discontinued or modified in a manner that has the potential to increase emissions (for example, changes in firebox dimensions, airflow rates, airflow direction, heat output, or pressure

differential through the unit), and thus potentially alter its ability to meet the applicable Program emissions level.

Discontinued models will be removed from the Program. If a modification has the potential to increase emissions, the model should be retested and the laboratory test report including all test documentation should be submitted to EPA. Partner should promptly discontinue use of Program qualifying labels and hangtags on units that are manufactured after a model has been modified in a manner that has the potential to increase emissions, pending EPA's response to Partner's submission. If the modified model meets the Program Phase 1 or Phase 2 emission level, a new Phase 1 or Phase 2 emission level qualifying label and hangtag for that model may be generated (e.g. to reflect the date of the new EPA letter acknowledging Program Phase 1 or Phase 2 emission level qualified model status, to reflect the new results of emissions testing, etc.) If the modified model does not meet the Program Phase 1 or Phase 2 emission level, Partner should not use the label or hangtag on the modified model.-

Test Method 28 OWHH for Measurement of Particulate Emissions and Heating Efficiency of Outdoor Wood-Fired Hydronic Heating Appliances

1.0 Scope and Application

1.1 This test method applies to wood-fired hydronic heating appliances, which the manufacturer specifies for outdoor installation or in structures not normally occupied by humans. The units transfer heat to the indoor environment through circulation of a liquid heat exchange media such as water or a water-antifreeze mixture.

1.2 The test method simulates hand loading of seasoned cordwood and measures particulate emissions and delivered heating efficiency at specified heat output rates based on the appliance's rated heating capacity.

1.3 Particulate emissions are measured by the dilution tunnel method as specified in ASTM Standard Test Method for Determination Of Particulate Matter Emissions Collected In A Dilution Tunnel. Delivered Efficiency is measured by determining the heat output through measurement of the flow rate and temperature change of water circulated through a heat exchanger external to the appliance and determining the input from the mass of dry wood fuel and its higher heating value. Delivered efficiency does not attempt to account for pipeline loss.

1.4 Products covered by this test method include both pressurized and non-pressurized heating appliances intended to be fired with wood. These products are wood-fired hydronic heating appliances which the manufacturer specifies for outdoor installation or in structures not normally occupied by humans. They are often connected to an indoor heat exchanger by insulated pipes buried in the ground and normally include a pump to circulate heated liquid. They are used to heat structures such as homes, barns and greenhouses and can heat domestic hot water, spas or swimming pools.

1.5 Distinguishing features of products covered by this standard include:

1.5.1 Manufacturers specifies for outdoor installation or in structures not normally occupied by humans.

1.5.2 A firebox with an access door for hand loading of fuel .

1.5.3 Typically an aquastat that controls combustion air supply to maintain the liquid in the appliance within a predetermined temperature range provided sufficient fuel is available in the firebox.

1.5.4 A chimney or vent that exhausts combustion products from the appliance.

1.6 The values stated are to be regarded as the standard whether in I-P or SI units. The values given in parentheses are for information only.

2.0 Summary of Method and References

2.1 Particulate matter emissions are measured from a wood– fired hydronic heating appliance burning a prepared test fuel crib in a test facility maintained at a set of prescribed conditions. Procedures for determining burn rates, and particulate emissions rates and for reducing data are provided.

2.2 Referenced Documents

2.2.1 EPA Standards

2.2.2 40 CFR Part 60 Subpart AAA, Method 5G

2.2.3 Method 28 Certification and Auditing of Wood Heaters

2.2.4 ASTM Standard Test Method for Determination Of Particulate Matter Emissions Collected In A Dilution Tunnel.

2.2.5 ASTM E711 – Standard Test Method for Gross Value of Refuse-Derived Fuel by the Bomb Calorimeter.

2.2.6 CAN/CSA-B415.1-00 Performance Testing of Solid-Fuel-Burning Heating Appliances

3.0 Terminology

3.1 Definitions

3.1.1 Hydronic Heating – A heating system in which a heat source supplies energy to a liquid heat exchange media such as water that is circulated to a heating load and returned to the heat source through pipes.

3.1.2 Aquastat – A control device that opens or closes a circuit to control the rate of fuel consumption in response to the temperature of the heating media in the heating appliance.

3.1.3 Delivered Efficiency – The percentage of heat available in a test fuel charge that is delivered to a simulated heating load as specified in this test method. This test does not account for jacket losses or for transfer line losses which will vary with actual application.

3.1.4 Manufacturer's Rated Heat Output Capacity –The value in BTU/hr (MJ/hr) that the manufacturer specifies a particular model of hydronic heating appliance is capable of supplying at its design capacity as verified by testing, in accordance with Section 13.

3.1.5 Burn rate – The rate at which test fuel is consumed in an appliance. Measured in lbs of wood (dry basis) per hour (kg/hr).

3.1.6 Firebox – The chamber in the appliance in which the test fuel charge is placed and combusted.

3.1.7 Test fuel charge – The collection of Test Fuel layers placed in the appliance at the start of the emission test run.

3.1.8 Test Fuel Layer – Horizontal arrangement of Test Fuel Units.

3.1.9 Test Fuel Unit – One or more Test Fuel Pieces with $\frac{3}{4}$ inch (19mm) spacers attached to the bottom and to one side. If composed of multiple Test Fuel Pieces, the bottom spacer may be one continuous piece.

3.1.10 Test Fuel Piece – A single 4 x 4 (4 ± 0.25 inches by 4 ± 0.25 inches)[100 ± 6 mm by 100 ± 6 mm] white or red oak wood piece cut to the length required.

3.1.11 Test Run – An individual emission test which encompasses the time required to consume the mass of the test fuel charge.

4.0 Summary of Test Method

4.1 Dilution Tunnel. Emissions are determined using the “dilution tunnel” method specified in ASTM Standard Test Method For Determination Of Particulate Matter Emissions Collected In A Dilution Tunnel. The flow rate in the dilution tunnel is maintained at a constant level throughout the test cycle and accurately measured. Samples of the dilution tunnel flow stream are extracted at a constant flow rate and drawn through high efficiency filters. The filters are dried and weighed before and after the test to determine the emissions catch and this value is multiplied by the ratio of tunnel flow to filter flow to determine the total particulate emissions produced in the test cycle.

4.2 Efficiency. The efficiency test procedure takes advantage of the fact that this type of appliance delivers heat through circulation of the heated liquid (water) from the appliance to a remote heat exchanger and back to the appliance. Measurements of the water temperature difference as it enters and exits the heat exchanger along with the measured flow rate allow for an accurate determination of the useful heat output of the appliance. The input is determined by weight of the test fuel charge, adjusted for moisture content, multiplied by the Higher Heating Value.

Additional measurements of the appliance weight and temperature at the beginning and end of a test cycle are used to correct for heat stored in the appliance.

4.3 Operation. Appliance operation is conducted on a hot-to-hot test cycle meaning that the appliance is brought to operating temperature and a coal bed is established prior to the addition of the test fuel charge and measurements are made for each test fuel charge cycle. The measurements are made under constant heat draw conditions within pre-determined ranges. No attempt is made to modulate the heat demand to simulate an indoor thermostat cycling on and off in response to changes in the indoor environment. Four test categories are used. These are:

4.3.1 Category I: A heat output of 15% or less of Manufacturer's Rated Heat Output Capacity.

4.3.2 Category II: A heat output of 16% to 24% of Manufacturer's Rated Heat Output Capacity.

4.3.3 Category III: A heat output of 25% to 50% of Manufacturer's Rated Heat Output Capacity.

4.3.4 Category IV: Manufacturer's Rated Heat Output Capacity.

5.0 Significance and Use

5.1 The measurement of particulate matter emission rates is an important test method widely used in the practice of air pollution control.

5.1.1 These measurements, when approved by state or federal agencies, are often required for the purpose of determining compliance with regulations and statutes.

5.1.2 The measurements made before and after design modifications are necessary to demonstrate the effectiveness of design changes in reducing emissions and make this standard an important tool in manufacturer's research and development programs.

5.2 Measurement of heating efficiency provides a uniform basis for comparison of product performance that is useful to the consumer. It is also required to relate emissions produced to the useful heat production.

5.3 This is a laboratory method and is not intended to be fully representative of all actual field use. It is recognized that users of hand-fired wood burning equipment have a great deal of influence

over the performance of any wood-burning appliance. Some compromises in realism have been made in the interest of providing a reliable and repeatable test method.

6.0 Apparatus

6.1 Scale. A platform scale capable of weighing the appliance under test and associated parts and accessories when completely filled with water to an accuracy of ± 1.0 pound (± 0.5 kg).

6.2 Heat exchanger. A water-to-water heat exchanger capable of dissipating the expected heat output from the system under test.

6.3 Temperature Difference Measurement. Thermocouples or a thermopile installed in thermowells shall be used to measure the temperature difference in water entering and leaving the heat exchanger. The temperature difference measurement shall have an uncertainty of ± 0.50 °F (± 0.25 °C).

6.4 Water flow meter. Water flow meters shall be installed on both the appliance side and the load side of the heat exchanger.

6.4.1 Appliance side water flow meter. A totalizing type water flow meter with a resolution of 0.1 gallon (0.025 L) and an accuracy of 2% of volume recorded or a flow meter with an accuracy of ± 0.1 gal/min (± 0.025 L/min).

6.4.2 Load side water meter. A totalizing type water flow meter with a resolution of 0.1 gallon (0.025 L) and an accuracy of 0.5% of volume recorded or a flow meter with an accuracy of ± 0.01 gal/min (± 0.0025 L/min).

6.5 Recirculation Pump. Circulating pump used during test to prevent stratification of liquid being heated.

7.0 Safety

7.1 These tests involve combustion of wood fuel and substantial release of heat and products of combustion. The heating system also produces large quantities of very hot water and the potential for steam production and system pressurization. Appropriate precautions must be taken to protect personnel from burn hazards and respiration of products of combustion.

8.0 Sampling, Test Specimens and Test Appliances

8.1 Test specimens shall be supplied as complete appliances including all controls and accessories necessary for installation in the test facility. A full set of specifications and design and assembly drawings shall be provided when the product is to be placed under certification of a third-party agency. The manufacturer's written installation and operating instructions are to be used as a guide in the set-up and testing of the appliance.

9.0 Preparation of Apparatus

9.1.1.1 The appliance is to be placed on a scale capable of weighing the appliance fully loaded with a resolution of ± 1.0 lb (0.5 kg).

9.1.1.2 The appliance shall be fitted with the type of chimney recommended or provided by the manufacturer and extending to 15 ± 0.5 feet (4.6 ± 0.15 m) from the upper surface of the scale. If no flue or chimney system is recommended or provided by the manufacturer, connect the appliance to a flue of a diameter equal to the flue outlet of the appliance. The flue section from the appliance flue collar to 8 ± 0.5 feet above the scale shall be single wall stove pipe and the remainder of the flue shall be double wall insulated class A chimney.

9.1.1.3 A recirculation pump shall be installed between connections at the top and bottom of the appliance to minimize thermal stratification. The pump shall not be installed in such a way as to change or affect the flow rate between the appliance and the heat exchanger.

9.1.1.4 Prior to filling the tank, weigh and record the appliance mass.

9.1.1.5 Plumb the unit to a water-to-water heat exchanger with sufficient capacity to draw off heat at the maximum rate anticipated. Route hoses and electrical cables and instrument wires in a manner that does not influence the weighing accuracy of the scale as indicated by placing dead weights on the platform and verifying the scale's accuracy.

9.1.1.5.1 Locate thermocouples to measure the water temperature at the inlet and outlet of the heat exchanger in the supply line and return line from Appliance being tested. Also install a calibrated water flow meter. The reported efficiency and heat output rate shall be based on measurements made on the appliance side of the system. If temperature differences are expected to be small, a differential thermopile should be used to measure the water differential temperature. The average of the outlet and return water temperature on the supply side of the system shall be considered the average appliance temperature for calculation of heat storage in the appliance (**TF** and **TI**). (See Figures 2 and 3.)

9.1.1.5.2 Temperature and flow meter instrumentation shall be installed in the output and return lines from the cooling water system as a secondary check on the results. The water flow meter is to be installed on the cooling water inlet side of the heat exchanger so that it will operate at the same temperature as its calibration. Place the heat exchanger in a box with 2 inches (50mm) of **EPS** foam insulation surrounding it to minimize heat losses from the heat exchanger.

9.1.1.6 Fill the system with water. Determine the total weight of the water in the appliance when the water is circulating. Verify that the scale indicates a stable weight under operating conditions. Make sure air is purged properly.

10.0 Calibration and Standardization

10.1 Temperature Sensors. Temperature measuring equipment shall be calibrated to NIST traceable standards at least once every six months.

10.2 Water Flow Meter. The water flow meter shall be calibrated using NIST Traceable methods at least once every six months.

10.3 Scales. The scales used to weigh the appliance and test fuel charge shall be calibrated using NIST Traceable methods at least once every 6 months.

10.4 Moisture Meter. The moisture meter shall be calibrated per the manufacturer's instructions and checked before each use.

11.0 Conditioning

11.1 Prior to testing, the non-catalytic appliance is to be operated for a minimum of 10 hours using a medium heat draw rate. Catalytic units shall be operated for a minimum of 50 hours using a medium heat draw rate. The pre-burn for the first test can be included as part of the conditioning requirement. If conditioning is included in pre-burn, then the appliance shall be aged with fuel meeting the specifications outlined in Sections 13.2 with a moisture content between 19 and 25 percent on a dry basis. Operate the appliance at a medium burn rate (Category II or III) for at least 10 hours for non-catalytic appliances and 50 hours for catalytic appliances. Record and report hourly flue gas exit temperature data and the hours of operation. The aging procedure shall be conducted and documented by a testing laboratory.

12.0 Procedure

12.1 Appliance Installation. Assemble the appliance and parts in conformance with the manufacturer's written installation instructions. Clean the flue with an appropriately sized, wire chimney brush before each certification test series.

12.2 Fuel. Test fuel charge fuel shall be red (*Quercus ruba L.*) or white (*Quercus Alba*) oak 19 to 25% moisture content on a dry basis. Piece length shall be 80% of the firebox depth rounded down to the nearest 1 inch (25mm) increment. For example, if the firebox depth is 46 inches (1168mm) the 4 x 4 piece length would be 36 inches (46 inches x 0.8 = 36.8 inches round down to 36 inches. Pieces are to be placed in the firebox parallel to the longest firebox dimension. For fireboxes with sloped surfaces that create a non-uniform firebox length, the piece length shall be adjusted for each layer based on 80% of the length at the level where the layer is placed. Pieces are to be spaced $\frac{3}{4}$ inches (19mm) apart on all faces. The first fuel layer may be assembled using fuel units consisting of multiple 4 x 4's consisting of single pieces with bottom and side spacers of 3 or more pieces if needed for a stable layer. The second layer may consist of fuel units consisting of no more than two pieces with spacers attached on the bottom and side. The top two layers of the fuel charge must consist of single pieces unless the fuel charge is only three layers. In that instance only the top layer must consist of single units. Three quarter inch (19mm) by 1- $\frac{1}{2}$ inch (38mm) spacers shall be attached to the bottom of piece to maintain a $\frac{3}{4}$ inch (19mm) separation. When a layer consists of two or more units of 4 x 4's and additional $\frac{3}{4}$ inch (19mm) thick by 1.5 inch (38mm) wide spacer shall be attached to the vertical face of each end of one 4 x 4, such that the $\frac{3}{4}$ inch (19mm) space will be maintained when two 4 x 4 units or pieces are loaded side by side. In cases where a layer contains an odd number of 4 x 4's one piece shall not be attached, but shall have spacers attached in a manner that will provide for the $\frac{3}{4}$ inch (19mm) space to be maintained. (See Figure 1). Spacers shall be attached perpendicular to the length of the 4 x 4's such that the edge of the spacer is 1 ± 0.25 inch from the end of the 4 x 4's in the previous layers. Spacers shall be red or white oak and will be attached with either nails (non-galvanized), brads or oak dowels. The use of kiln dried wood is not allowed.

12.2.1 Moisture Content. Determine the test fuel moisture content with a calibrated electrical resistance moisture meter. Determine fuel moisture for each fuel piece by averaging at least three moisture meter readings, one from each of three sides, measured parallel to the wood grain. Measure the moisture content within 2 to 3 inches (50 to 75mm) of each end and at the center of each piece. Average all the readings for each fuel piece in the test fuel charge. Penetration of the moisture meter insulated electrodes shall be 3/4 inch (19 mm). Measure the moisture content within a 4-hour period prior to the test run. The fuel shall be stored under uniform conditions of humidity and temperature ($\pm 10\%$ of nominal RH and ± 5 F of nominal temperature). It is not required to measure the moisture content of the spacers. The addition of moisture to the test fuel is not allowed.

12.2.2 Firebox Volume. Determine the firebox volume in cubic feet. Firebox volume shall include all areas accessible through the fuel loading door where firewood could reasonably be placed up to the horizontal plane defined by the top of the loading door. A drawing of the firebox showing front, side and plan views or an isometric view with interior dimensions shall be provided by the manufacturer and verified by the laboratory. Calculations for firebox volume from computer aided design (CAD) software programs are acceptable and shall be included in the test report if used. If the firebox volume is calculated by the laboratory the firebox drawings and calculations shall be included in the test report.

12.2.3 Test Fuel charge. Test fuel charges shall be determined by multiplying the firebox volume by 10 pounds (4.54 kg) of wood (as used wet weight) per ft^3 (28L). Select the number of pieces of standard fuel that most nearly match this target weight. This is the standard fuel charge for all tests. For example, if the firebox loading area volume is 10 ft^3 (280L) and the firebox depth is 46 inches (1168mm), test fuel charge target is 100 lbs. (45kg) minimum and the piece length is 36

inches (914mm). If 8 - 4 x 4's, 36 inches long weigh 105 lbs (48kg), use 8 pieces for each test fuel charge. All test fuel charges will be of the same configuration.

12.3 Sampling Equipment. Prepare the sampling equipment as defined by ASTM Standard Test Method For Determination Of Particulate Matter Emissions Collected In A Dilution Tunnel.

12.4 Appliance Start-Up. The appliance shall be fired with wood fuel of any species, size and moisture content at the laboratories discretion to bring it up to operating temperature. Operate the appliance until the water is heated to the upper operating control limit and has cycled at least two times. Then remove all unburned fuel, zero the scale and verify the scales accuracy using dead weights.

12.4.1 Pre-Test Burn Cycle. Reload appliance with oak wood and allow it to burn down to the specified coal bed weight. The Pre-Test burn cycle fuel charge weight shall be within $\pm 10\%$ of the test fuel charge weight. Piece size and length shall be selected such that charcoalization is achieved by the time the fuel charge has burned down to the required coal bed weight. Pieces with a maximum thickness of approximately 2 inches have been found to be suitable.

Charcoalization is a general condition of the test fuel bed evidenced by an absence of large pieces of burning wood in the coal bed and the remaining fuel pieces being brittle enough to be broken into smaller charcoal pieces with a metal poker. Manipulations to the fuel bed prior to the start of the test run are to be done to achieve charcoalization while maintaining the desired heat output rate. During the pre-test burn cycle and at least one hour prior to starting the test run, adjust water flow to the heat exchanger to establish the target heat draw for the test. For the first test run the heat draw rate shall be equal to the manufacturer's rated heat output capacity.

12.4.1.1 Allowable Adjustments. Fuel addition or subtractions, and coal bed raking shall be kept to a minimum but are allowed up to 15 minutes prior to the start of the test run. For the purposes

of this method, coal bed raking is the use of a metal tool (poker) to stir coals, break burning fuel into smaller pieces, dislodge fuel pieces from positions of poor combustion, and check for the condition of charcoalization. Record all adjustments to and additions or subtractions of fuel, and any other changes to the appliance operations that occur during pretest ignition period. During the 15-minute period prior to the start of the test run, the wood heater loading door shall not be open more than a total of 1 minute. Coal bed raking is the only adjustment allowed during this period.

12.4.2 Coal Bed Weight. The appliance is to be loaded with the test fuel charge when the coal bed weight is between 10% and 20% of the test fuel charge weight. Coals may be raked as necessary to level the coal bed but may only be raked and stirred once between 15 to 20 minutes prior to the addition of the test fuel charge.

12.5 Test Cycle. Complete a test run in each heat output rate category, as follows:

12.5.1 Test Run Start. Once the appliance is operating normally and the pretest coal bed weight has reached the target value per 12.4.2, tare the scale and load the full test charge into the appliance. Time for loading shall not exceed 5 minutes. The actual weight of the test fuel charge shall be measured and recorded within 30 minutes prior to loading. Start all sampling systems and record all data at intervals of 10 minutes or less. Record water flow and temperature data and monitor the average heat output rate. If the heat output rate gets close to the upper or lower limit of the target range ($\pm 5\%$) adjust the water flow through the heat exchanger to compensate. Make changes as infrequently as possible while maintaining the target heat output rate. The first test run shall be conducted at the category IV heat output rate to validate that the appliance is capable of producing the manufacturer's rated heat output capacity.

12.5.2 Test Fuel Charge Adjustment. It is acceptable to adjust the test fuel charge (i.e. reposition) once during a test run if more than 60 percent of the initial test fuel charge weight has been consumed and more than 10 minutes have elapsed without a measurable (1 lb or 0.5 kg) weight change while the operating control is in the demand mode. The time used to make this adjustment shall be less than 60 seconds.

12.5.3 Test Run Completion. The test run is completed when the remaining weight of the test fuel charge is 0.0 lb (0.0 kg). End the test run when the scale has indicated a test fuel charge weight of 0.0 lb (0.0 kg) or less for 30 seconds. At the end of the test run, stop the particulate sampling train, and record the run time, and all final measurement values.

12.5.4 Heat Output Capacity Validation. The first test run must produce a heat output rate that is within 10% of the manufacturer's rated heat output capacity (Category IV). If the appliance is not capable of producing a heat output within this limit, the manufacturer's rated heat output capacity is considered not validated. In such cases, the tests may be continued using the heat output capacity as measured as the Manufacturer's Rated Heat Output Capacity if requested by the manufacturer.

12.5.5 Additional Test Runs. Using the Manufacturer's Rated Heat Output Capacity as a basis, conduct a test for additional heat output categories as specified in 4.4.1. It is not required to run these tests in any particular order.

12.5.6 Alternative Heat Output Rate for Category I. If an appliance cannot be operated in the category I heat output range due to stopped combustion, two test runs shall be conducted at heat output rates within Category II. When this is the case, the weightings for the weighted averages indicated in section 15.1.14 shall be the average of the category I and II weightings and shall be

applied to both category II results. Appliances that are not capable of operation within Category II (<25% of maximum) cannot be evaluated by this test method.

12.5.6.1 Stopped Fuel Combustion. Evidence that an appliance cannot be operated at a category I heat output rate due to stopped fuel combustion shall include documentation of two or more attempts to operate the appliance in burn rate Category I and fuel combustion has stopped prior to complete consumption of the test fuel charge. Stopped fuel combustion is evidenced when an elapsed time of 60 minutes or more has occurred without a measurable (1 lb or 0.5 kg) weight change in the test fuel charge while the appliance operating control is in the demand mode.

Report the evidence and the reasoning used to determine that a test in burn rate Category I cannot be achieved. For example, two unsuccessful attempts to operate at an output rate of 10% of the rated output capacity are not sufficient evidence that burn rate Category I cannot be achieved.

12.5.7 Appliance Overheating. Appliances shall be capable of operating in all heat output categories without overheating to be rated by this test method. Appliance overheating occurs when the rate of heat withdrawal from the appliance is lower than the rate of heat production when the unit control is in the idle mode. This condition results in the water in the appliance continuing to increase in temperature well above the upper limit setting of the operating control. Evidence of overheating includes: 1 hour or more of appliance water temperature increase above the upper temperature set-point of the operating control, exceeding the temperature limit of a safety control device (independent from the operating control), boiling water in a non-pressurized system or activation of a pressure or temperature relief valve in a pressurized system.

12.6 Additional Test Runs. The testing laboratory may conduct more than one test run in each of the heat output categories specified in Section 4.4.1. If more than one test run is conducted at a specified heat output rate, the results from at least two-thirds of the test runs in that heat output rate category shall be used in calculating the weighted average emission rate (see Section 15.1.14).

The measurement data and results of all test runs shall be reported regardless of which values are used in calculating the weighted average emission rate.

13.0 Calculation of Results

13.1 Symbols

E_T – Total particulate emissions measured during a full test cycle – grams

$E_{g/MJ}$ – Emission rate in grams per mega joule of heat output.

$E_{lb/mmBtu\ input}$ – Emissions rate in pounds per million Btu's of heat input.

$E_{lb/mmBtu\ output}$ – Emissions rate in pounds per million Btu's of heat output.

$E_{g/kg}$ – Emissions factor in grams per kilogram of dry fuel burned.

$E_{g/hr}$ – Emission factor in grams per hour.

HHV – Higher Heating Value of fuel = 8550 Btu/lb (19.874 MJ/kg) or as tested per ASTM E711.

LHV – Lower Heating Value of fuel = 7478 Btu/lb (17.382 MJ/kg) or as tested per ASTM E711.

ΔT – Temperature difference between water entering and exiting the heat exchanger.

Q_{out} – Total heat output in BTU's (mega joules).

Q_{in} – Total heat input available in test fuel charge in BTU's (mega joules).

\dot{M} – Mass flow rate of water lb/min (kg/min).

V_i – Volume of water indicated by a totalizing flow meter at the i^{th} reading in gallons (liters).

V_f – Volumetric Flow rate of water in heat exchange system in gallons per minute (liters/min).

t_i – Elapsed time from start of test run at i^{th} reading in minutes.

η – Delivered heating efficiency in percent.

F_i – Weighting factor for heat output category i .

T_{avg} – Average temperature of water in the load side of the heat exchanger.

TI_{avg} – Average temperature of the appliance and water at start of the test.

TF_{avg} – Average temperature of the appliance and water at the end of the test.

MC – Fuel moisture content in percent based on dry fuel weight.

MC_i – Average moisture content of individual 4 x 4 fuel pieces on an dry weight basis.

MC_{sp} – Moisture content of spacers assumed to be 10%.

σ – Density of water in pounds per gallon.

C_p – Specific Heat of Water in Btu per pound degree F.

C_{steel} – Specific Heat of Steel (0.1 Btu/ lb -°F)

W_{fuel} – Fuel charge weight in pounds (kg)

W_i – Weight of individual fuel 4 x 4 pieces in pounds (kg)

W_{sp} – Weight of all spacers used in a fuel load in pounds (kg)

W_{app} – Weight of appliance in pounds

W_{wat} – Weight of water in supply side of the system in pounds

13.2 After the test is completed, determine the particulate emissions E_T

$$E_T = (C_s - C_r) Q_s d\theta$$

13.3 Determine Average Fuel Load Moisture Content

$$MC_{Ave} = \left[\left[\sum W_i \times MC_i \right] + \left[W_{sp} \times MC_{sp} \right] \right] \div W_{fuel}$$

13.4 Determine heat input

$$Q_{in} = (W_{fuel} / (1 + (MC/100))) \times HHV$$

$$Q_{inLHV} = (W_{fuel} / (1 + (MC/100))) \times LHV$$

13.5 Determine heat output and efficiency

13.5.1 Determine heat output as:

$Q_{out} = \sum [C_p \times \Delta T \times \text{Mass Flow Rate}(\text{lb}/\text{min}) \times \text{time interval}(\text{min})] + \text{Change in heat stored in the appliance.}$

$$Q_{out} = \left[\sum (C_p \cdot \Delta T \cdot \dot{M} \cdot t) \right] + (W_{app} \cdot C_{Steel} + C_p W_{water}) \cdot (TF_{avg} - TI_{avg})$$

\dot{M} = Mass flow rate = gal/min x Density of Water (lb/gal) = lb/min

$$\dot{M} = V_f \cdot \sigma$$

$$\sigma = (62.56 + (-.0003413 \times T_{avg}) + (-.00006225 \times T_{avg}^2)) \cdot 0.1337 \text{ lbs/gal} :$$

$$C_p = 1.0014 + (-.000003485 \times T_{avg}) \text{ Btu/lb-}^\circ\text{F}$$

$$C_{steel} = 0.1 \text{ Btu/lb-}^\circ\text{F}$$

$$V_f = (V_i - V_{i-1}) / (t_i - t_{i-1}) :$$

Note: V_i is the total water volume at the end of interval i and V_{i-1} is the total water volume at the beginning of the time interval. This calculation is necessary when a totalizing type water meter is used.

Change in heat stored in the appliance = [(weight of the appliance x .1) + (weight of water in the appliance x C_p)] x (final average temperature of the appliance – initial average temperature of the appliance)

Where C_p is the specific heat of water.

13.5.2 Determine Heat output rate as:

$$\text{Heat Output Rate} = Q_{out} / \text{test cycle duration in hours}$$

13.5.3 Determine Emission Rates as:

$$E_{g/MJ} = E_T / (Q_{out} \times 0.001055)$$

$$E_{lb/MM BTU input} = (E_T / 453.59) / (Q_{input} \times 10^{-6})$$

$$E_{lb/MM BTU output} = (E_T / 453.59) / (Q_{output} \times 10^{-6})$$

$$E_{g/hr 10,000BTU} = E_T / (\text{test duration} \times (Q_{out} / 10,000))$$

$$E_{g/kg} = E_T / (W_{fuel} / (1 + MC/100))$$

$$E_{g/hr} = E_T / \text{test duration}$$

Determine delivered efficiency as:

$$\eta_{del} = (Q_{out} / Q_{in}) \times 100$$

$$\eta_{delLHV} = (Q_{out} / Q_{inLHV}) \times 100$$

13.6 Weighted Average Emissions and Efficiency

13.6.1 Determine the weighted average emission rate and delivered efficiency from the individual tests in the specified heat output categories. The weighting factors (F_i) are derived from an analysis of ASHRAE Bin Data which provides details of normal building heating requirements in terms of percent of design capacity and time in a particular capacity range – or “bin” - over the course of a heating season. The values used in this method represent an average of data from several cities located in the northern United States.

Weighted average delivered efficiency: $\eta_{avg} = \sum \eta_i \times F_i$

Weighted average emissions: $E_{avg} = \sum E_i \times F_i$

13.7 Average BTU/hr for 8 hour burn time and Average 8 hour Efficiency Rating:

13.7.1 Units tested under this standard typically require infrequent fueling, 8 to 12 hours intervals being typical. Rating units based on an Average Output sustainable over an 8 hour duration will assist consumers in appropriately sizing units to match the theoretical heat demand of their application, and the 8 hour efficiency rating will permit consumers to compare the efficiencies of different models.

13.7.2 Calculations:

$$\text{Average BTU/hr for 8 hr. burn time} = X1 + \{(8 - Y1) \times [(X2 - X1) / (Y2 - Y1)]\}$$

Where:

Y1 = Test Duration just above 8 hrs

Y2 = Test Duration just below 8 hrs

X1 = Actual Load for duration Y1

X2 = Actual Load for duration Y2

Average 8 hour Efficiency Rating

$$\text{8 hour Efficiency Rating} = X1 + \{(8-Y1) \times [(X2-X1)/(Y2-Y1)]\}$$

Where:

Y1 = Test Duration just above 8 hrs

Y2 = Test Duration just below 8 hrs

X1 = Actual Efficiency for duration Y1

X2 = Actual Efficiency for duration Y2

13.7.2.1 Determine the Test Durations and Actual Load and Efficiencies for each Category as recorded in Table 1.

13.7.2.2 Determine the data point that has the nearest duration greater than 8 hrs. X1 = Actual Load and Efficiency

Y1 = Test Duration for this data point.

13.7.2.3 Determine the data point that has the nearest duration less than 8 hrs. X2 = Actual Load and Efficiency

Y2 = Test Duration for this data point.

13.7.2.4 Example:

Category	Actual Load (Btu/Hr)	Duration (Hr)	Efficiency (%)
1	15,000	10.2	60
2	26,000	8.4	65
3	50,000	6.4	70
4	100,000	4.7	75

Category 2 Duration is just above 8 hrs, therefore: X1 = 26,000 Btu/hr and Y1 = 8.4 hrs, (For the 8 hour Efficiency calculation; X1 = 65%)

Category 3 Duration is just below 8 hrs, therefore: X2 = 50,000 Btu/hr and Y2 = 6.4 hrs, (For the 8 hour Efficiency calculation; X2 = 70%)

$$\begin{aligned}
8 \text{ Hr Burn Load} &= 26,000 + \{(8-8.4) \times [(50,000 - 26,000)/(6.4-8.4)]\} \\
&= 30,800 \text{ Btu/hr} \\
8 \text{ Hr Efficiency} &= 65\% + \{(8-8.4) \times [(70\% - 65\%)/(6.4-8.4)]\} \\
&= 66\%
\end{aligned}$$

14.0 Report

14.1.1 The report shall include the following.

14.1.2 Name and location of the laboratory conducting the test.

14.1.3 A description of the appliance tested and its condition, date of receipt and dates of tests.

14.1.4 A statement that the test results apply only to the specific appliance tested.

14.1.5 A statement that the test report shall not be reproduced except in full, without the written approval of the laboratory.

14.1.6 A description of the test procedures.

14.1.7 Details of deviations from, additions to or exclusions from the test method, and information on specific test conditions, such as environmental conditions.

14.1.8 A list of participants and observers present for the tests.

14.1.9 Data and drawings indicating the fire box size and location of the fuel charge.

14.1.10 Drawings and calculations used to determine firebox volume.

14.1.11 Information for each test run fuel charge including piece size, moisture content and weight.

14.1.12 Temperature, appliance weight, fuel charge weight and water flow data recorded during each test run.

14.1.13 Test run duration for each test.

14.1.14 Calculated results for delivered efficiency at each burn rate and the weighted average Emissions reported as total emissions in grams, pounds per million Btu of delivered heat, grams per mega-joule of delivered heat, grams per kilogram of dry fuel, grams per hour and grams per hour 10,000 Btu. Results shall be reported for each heat output category and the weighted average.

14.1.15 Tables 1 and 2a and 2b must be used for presentation of results in test reports.

14.1.16 A statement of the estimated uncertainty of measurement of the emissions and efficiency test results.

14.1.17 Raw data, calibration records, and other relevant documentation shall be retained by the laboratory for a minimum of 7 years.

Table 1.

CAT	Load % Capacity	Tgt Load Btu/hr	Act Load Btu/hr	Test Duration Hours	Wood Wt Lb	Q _{in}	Q _{out}	η _N	E _T	E	E	E	E	E
						Btu	Btu	%	g	g/MJ	lb/mmbtu	g/hr	g/kg	g/hr 10,000 Btu
I	<15% of max													
II	16 – 24% of max													
III	25 - 50% of max													
IV	Max capacity													

Average Btu/hr for 8 hr. burn time

Table 2a Heating Season Weighting.

CAT	Weighting Factor (F _i)	E _{g/MJ,i} x F _i	E _{g/kg,i} x F _i	E _{lb/mmbtu} x F _i	E _{g/hr} x F _i	E _{g/hr 10,000 Btu} x F _i
I	0.175					
II	0.275					
III	0.450					
IV	0.100					
Totals	1.000					

Table 2b Year Round Use Weighting.

CAT	Weighting Factor (F _i)	E _g /MJ _i x F _i	E _g /kg _i x F _i	E _{lb} /mmbtu x F _i	E _g /hr x F _i	E _g /hr 10,000 Btu x F _i
I	0.437					
II	0.238					
III	0.275					
IV	0.050					
Totals	1.000					

15.0 Precision and Bias

15.1 Precision—It is not possible to specify the precision of the procedure in Draft Test because the appliance operation and fueling protocols and the appliances themselves produce variable amounts of emissions and cannot be used to determine reproducibility or repeatability of this measurement method.

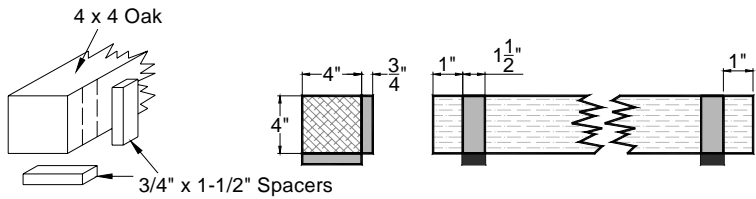
15.2 Bias—No definitive information can be presented on the bias of the procedure in Draft Test Method 28 OWHH for measuring solid fuel burning outdoor hydronic heater emissions because no material having an accepted reference value is available.

16.0 Keywords

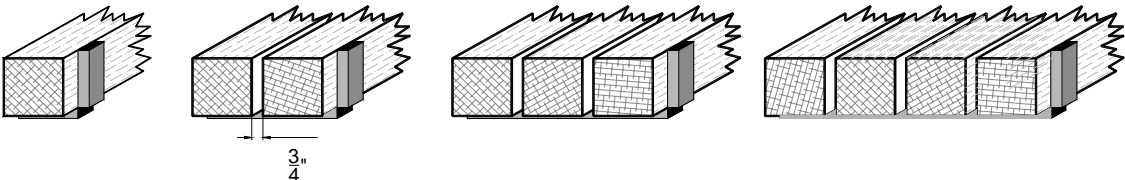
16.1 Solid fuel, hydronic heating appliances, wood-burning, outdoor hydronic heaters.

Figure 1. Typical Test Fuel Piece

Test Fuel Spacer Configuration



Test Fuel Units (1, 2, 3 and 4 pieces)



Typical Test Fuel Charge Configurations

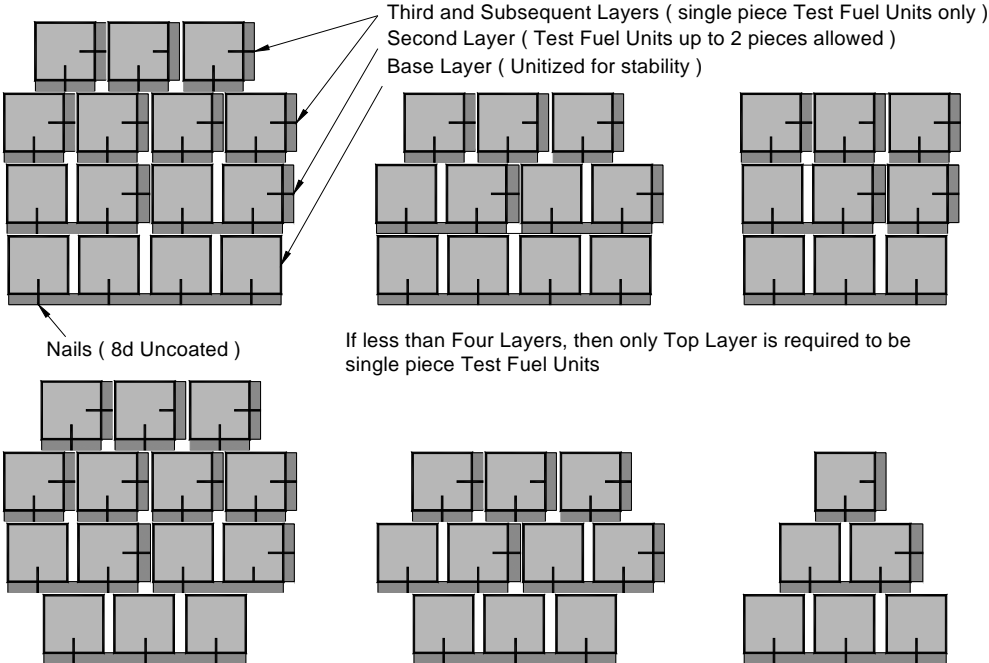


Figure 2. Heat Exchanger Schematic

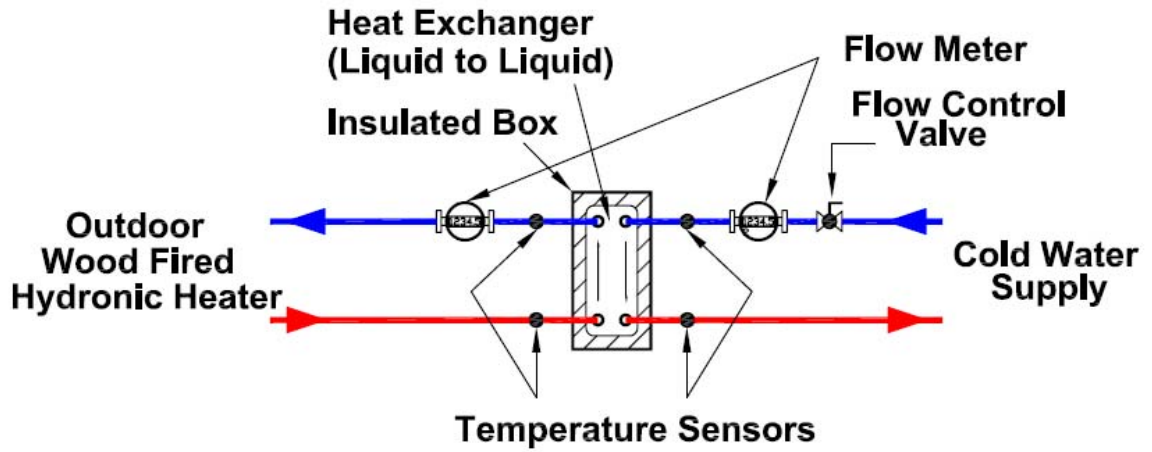
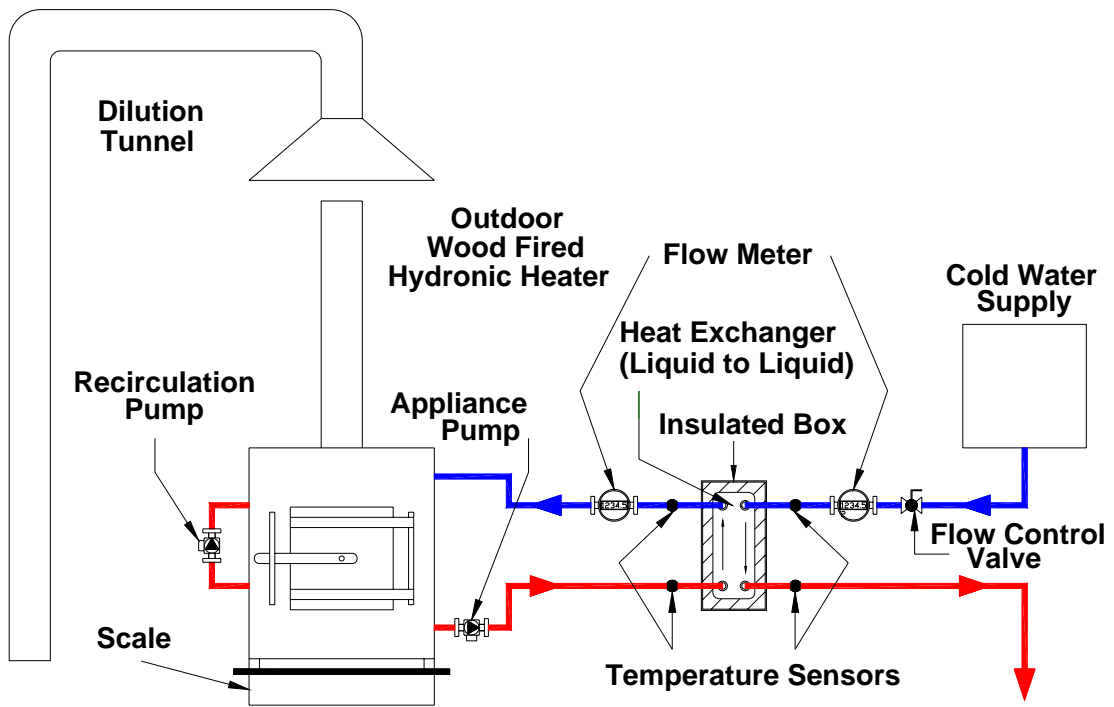


Figure 3. Set-Up Schematic



Note: Illustrated appliance pump location and flow path through the appliance are generic and may vary based on the unit being tested.

Partnership Agreement Attachment 3

Guidelines for Use of Label, Hangtag, And Outreach Materials

EPA Hydronic Heater Program, Phase 2

I. PURPOSE

The primary purpose of these Guidelines, which are part of the EPA Hydronic Heater Program (Program) Phase 2 Partnership Agreement (Agreement), is to ensure Program-wide consistency with regard to content, use, appearance, placement, and other matters related to Program qualifying labels and hangtags. Consistent representation of information and appearance of these items are important in order to maximize consumers' recognition of the Program. In addition, it will help build consumer confidence in the Program and will facilitate comparison of available hydronic heater models. These Guidelines also are intended to minimize misstatements in public communications about the Program and misuse of qualifying labels, hangtags, and outreach materials.

II. GENERAL COMMITMENTS

Partner agrees to use Program qualifying labels, hangtags, and outreach materials only in the manner specified in these Guidelines and only on or with reference to qualified models (see Definitions section of main Partnership Agreement document). **Phase 1 emission level qualified models will not be considered "qualified" after March 31, 2010.** Therefore, Program labels, hangtags, and outreach materials should not be used on or with reference to (such as in marketing/sales information) units from Phase 1 emission level qualified model lines manufactured after that date.

Partner agrees not to imply that EPA endorses a particular model, product, service, or company. Partner also agrees not to use the EPA logo or seal in any manner in connection with the Program.

Partner also agrees not to misuse Program qualifying labels, hangtags, and outreach materials, or misrepresent the Program or Partner's model(s) qualified status under the Program. EPA may terminate the Partnership Agreement, including the authorization to use the qualifying labels and hangtags, if Partner fails to act in accordance with the Agreement, which includes these Guidelines.

EPA intends to provide any new or revised guidance on labels, hangtags, or outreach materials to Partner in draft, and to give Partner an opportunity to comment prior to the guidance being issued in final form. However, the final decision on the content of EPA documents will be made by the Agency.

III. QUALIFYING LABELS AND HANGTAGS FOR PHASE 2 PROGRAM

A. Qualifying Label

Once EPA acknowledges in writing that Partner's model is either a "Phase 1 emission level qualified model" or a "Phase 2 emission level qualified model," Partner may elect to attach Program qualifying labels to the model. Partner agrees to generate qualifying labels based on the following guidance, thus ensuring that the appearance and content of the labels are consistent across all qualified models.

The qualifying label lists:

- (1) month and year of manufacture of the individual unit,
- (2) model number or name,
- (3) serial number,
- (4) one of the following three statements, as applicable:
 - (a) "Qualified at EPA Phase 1 Emission Level for Year Round Use Until [fill in date]" or
 - (b) "Qualified at EPA Phase 1 Emission Level ONLY FOR HEATING SEASON USE Until [fill in date]" or
 - (c) "Qualified at EPA Phase 2 Emission Level Until [fill in date]" EPA's letter acknowledging the model's qualified status will include the date to be filled in.
- (5) thermal output rating in MMBtu/hr,
- (6) date of EPA letter acknowledging qualified model status (described in Qualifying Process document (Partnership Agreement Attachment 1), section I.F.),
- (7) result of emissions testing in grams/hour,
- (8) result of average emissions testing expressed in terms of lb/MMBtu heat input for Phase 1 emission level qualified models, or lb/MMBtu heat output for Phase 2 emission level qualified models,
- (9) result of emissions testing in grams/hour/10,000 Btu heat output,
- (10) result of highest individual test run in grams/hour for Phase 2 emission level qualified models, and
- (11) overall input/output efficiency (percentage).

All of the preceding information should be printed in the same font and size.

In addition, the qualifying label includes one of the following two statements, depending on whether the model is a “Phase 1 emission level qualified model” or a “Phase 2 emission level qualified model”:

The U.S. Environmental Protection Agency has determined, based on test results from _____, an independent accredited laboratory, that this model line meets the U.S. EPA Hydronic Heater Voluntary Program **Phase 1** emission level. To minimize smoke, always operate your hydronic heater in accordance with the manufacturer’s instructions found in the owner’s manual. Additional information about EPA’s Program is available at www.epa.gov/woodheaters.

OR, as appropriate:

The U.S. Environmental Protection Agency has determined, based on test results from _____, an independent accredited laboratory, that this model line meets the U.S. EPA Hydronic Heater Voluntary Program **Phase 2** emission level. To minimize smoke, always operate your hydronic heater in accordance with the manufacturer’s instructions found in the owner’s manual. Additional information about EPA’s Program is available at www.epa.gov/woodheaters.

The qualifying label should be approximately 7 inches high by 6 inches wide, give or take an inch in either direction, with font sized to fit this space. “U.S. Environmental Protection Agency” and “EPA” should be no larger than the other lettering in the statement portion of the label.

The qualifying label should be affixed in a readily visible location on the exterior of the unit or, if there are no flat surfaces in a readily visible location on the exterior of the unit, the qualifying label may be affixed to the interior surface of the outer door to the unit. The label should be made of a neutral colored (i.e. similar to the color(s) used for required safety labels such as those conveying Underwriters Laboratories (UL) or Canadian Standards Association (CSA) information) material expected to last the lifetime of the unit, and should present the EPA statement (above) in a manner that is likely to remain legible for the lifetime of the unit.

The qualifying label text and hangtag should not be used on or in connection with advertising or other materials featuring hydronic heater models that are not qualified under the EPA Hydronic Heater Program.

B. Hangtag

Partner may also elect to attach Program hangtags to its qualified model(s). EPA will send a hangtag template to Partner along with EPA's letter acknowledging a model's qualified status under the Program. Partner agrees to generate hangtags via use of the template without modification, thus ensuring that the appearance (font type, size, and color; background color; label size; spacing) and the general content of the hangtags are consistent across all qualified models in the Program. The EPA Program Liaison is available to assist with use of the template.

Hangtags should be printed on a durable waterproof substrate such as 70 or 90 pound waterproof bond paper, and should measure 5 inches wide by 8 inches long. All hangtags should be printed in black ink. The entire template should appear on one side of the label (i.e. the text should not carry over to the other side), although Partner may choose to print the entire template on each side. The orange background color is PMS 131 for the Phase 1 tag. The Phase 2 background color is white, with PMS 131 orange trim.

The hangtag should not be used on or in connection with advertising or other materials featuring models that are not qualified under the EPA Hydronic Heater Program.

Attached are current samples of the hangtags for the various categories of models that can qualify under the Program (Phase 1 heating season only, Phase 1 year-round use, Phase 2).

IV. COMMENCEMENT AND DISCONTINUATION OF USE OF LABEL, HANGTAG

Partner agrees that use of Program qualifying labels and/or hangtags on a model would begin no sooner than Partner's receipt of EPA's written acknowledgment that the model is a qualified model. For example, Partner would not simply begin to use qualifying labels and/or hangtags once it signs an EPA Hydronic Heater Program Phase 2 Partnership Agreement. An exception exists for models that qualified under the Phase 1 Program; if EPA and the companies that own those models sign a Phase 2 Partnership Agreement, those models will automatically be considered qualified under this Phase 2 Program, and the companies may begin to use qualifying labels and/or hangtags as described in these guidelines.

Partner agrees to promptly discontinue use of Program labels and hangtags on all units manufactured after the date on which any of the following occurs:

- (1) termination of Partner's Partnership Agreement with EPA by either Partner or EPA;
- (2) termination of this Phase 2 Program;
- (3) qualification of a Phase 2 emission level qualified model has ended (5 years after the date of the EPA letter acknowledging qualified status), and

requalification of the model has not yet occurred or a waiver has not yet been granted;

(4) any change is made to a qualified model that has the potential to increase emissions.

In addition, Partner agrees not to use Phase 1 emission level qualified Program labels and hangtags on units manufactured after March 31, 2010. Also, Partner agrees not to use Program labels and hangtags on units manufactured after December 31, 2008 where qualification of the model was based on the ASTM cordwood test method exemption.

When any change that has the potential to increase emissions is made to a qualified model, Partner should promptly notify the EPA Program liaison and discontinue use of qualifying labels and hangtags with respect to any unit that incorporates the change. Partner may resume use of qualifying labels and hangtags once Partner has conducted new testing and submitted the laboratory report and associated documentation to EPA per the Program Qualifying Process (Partnership Agreement Attachment 1) and EPA has sent written acknowledgment that the modified model is a qualified model.

V. MODIFICATION OF LABEL, HANGTAG TEMPLATES

The goals of the Program will be best served by having consistent, easy to read qualifying labels and hangtags. However, should modification of the templates for these materials be called for, the Agency would distribute revised guidance or a new template to Partner as soon as possible.

Partner should begin to use the revised templates for qualifying labels within a reasonable time after receiving them for qualified model units which do not already bear a qualifying label at the time the revised guidance is received. For those qualified model units that already have labels affixed at the time a revised template is received, EPA suggests that Partner exchange existing labels for the newer version. Whether to follow this suggestion would be left to Partner's discretion.

If a revision to the templates for hangtags is made, Partner would begin to use the new templates on all qualified model units manufactured after receipt of the new templates within a reasonable time. Failure to implement label and hangtag modifications as described in this paragraph may result in Partner being dropped from the Program.

VI. OUTREACH MATERIALS

A. Owner's Manual Statement

Partner agrees to include in the owner's manual for qualified model(s) the following information:

1. The model's proper thermal output capacity for matching with a building's thermal demands;

2. Proper installation information;
3. Operation and maintenance information, including:
 - fuel loading procedures, and recommendations on fuel use and selection;
 - a statement indicating that the following are among the materials/substances that should not be used as fuel in a hydronic heater:
 - trash
 - plastics
 - gasoline
 - rubber
 - naphtha
 - household garbage
 - material treated with petroleum products (particleboard, railroad ties and pressure treated wood)
 - leaves
 - paper products
 - cardboard
 - proper fire starting procedures;
 - proper use of air controls;
 - air inlet or combustion blower tube should not be restricted by debris (creosote, ash, etc.)
 - flame baffle/flue should not be restricted by debris
 - chimney should not be restricted by debris
 - door seal provides air-tight seal when shut
 - ash removal procedures;
 - for catalytic models, information pertaining to maintaining catalyst performance, maintenance procedures, procedures for determining catalyst failure or deterioration, procedures for replacement, and warranty rights.
4. A statement indicating that the model is qualified for heating season use only (as opposed to year round use), where applicable. This statement should be included toward the beginning of the owner's manual, and should be provided in large font as compared with the text around the statement.
5. A statement indicating that the person(s) operating a hydronic heater must comply with all applicable laws or other requirements, such as state laws or regulations and local ordinances.
6. Statements indicating that the person(s) operating a hydronic heater is/are responsible for operation in a manner that does not create a public or private nuisance condition. The manufacturer's distance and stack height recommendations and the requirements in any applicable laws or other requirements may not always be adequate to prevent nuisance conditions due to terrain or other factors.

B. Other Outreach Materials

EPA may offer Program outreach materials to Partner. If Partner would like to use these materials, they agree to adhere to any guidelines and/or use any templates EPA provides. Failure to do so may result in Partner being dropped from the Program. Partners are welcome to submit suggestions to the EPA liaison for the Program at any time regarding additional EPA-generated outreach materials that they believe would enhance the effectiveness of the Program.

VII. PROGRAM COMMUNICATIONS

A. General

To maximize consumer confidence in the Program, Partner agrees not to misrepresent the Program or Partner’s model(s) qualification status in the Program. Partner will not create misleading statements that imply that suggest that EPA endorses a particular model, or that suggest that EPA endorses heating with hydronic heaters over other appliances. The Program name, qualifying label, hangtag, and other related items should not be used in a manner that would imply EPA endorsement of a company, products, or services. Consequently, the EPA logo cannot be used in any manner in connection with the Program.

B. Suggested Wording

EPA recommends use of the terminology in the left column in communications about the Program:

CORRECT

INCORRECT

QUALIFIED MODEL STATUS

QUALIFIED MODEL STATUS

- EPA Hydronic Heater Program qualified

- EPA Hydronic Heater Program compliant model
- EPA Hydronic Heater Program rated model

TEST METHODS AND EMISSION LEVELS

TEST METHODS AND EMISSION LEVELS

- EPA Hydronic Heater Program guidelines
- EPA Hydronic Heater Program test methods
- Model has met the EPA

- EPA Hydronic Heater Program standards
- EPA-certified model
- EPA-endorsed model

Hydronic Heater Program Phase 1 or Phase 2 emission level

- EPA-qualified model

- EPA-approved model

PARTNERS

- Company X, an EPA Hydronic Heater Program Phase 2 Partner
- A company/manufacturer participating in Phase 2 of the EPA Hydronic Heater Program

PARTNERS

- Company X, a company endorsed by EPA
- An EPA-approved hydronic heater manufacturer

C. Websites

Partner may not include the EPA logo on their website, but may link its company website to the EPA Hydronic Heater Program website (www.epa.gov/woodheaters).

D. Education of Employees and Others about Program

Partner agrees to provide information about the Program to its employees, and to persons or entities that participate in the development, manufacture, marketing, sales/distribution, and service of qualified models. In addition, Partner agrees to take steps to encourage these persons or entities to act in accordance with the Partnership Agreement.