

FIREWOOD KILN CERTIFICATION MANUAL

Certification Requirements and Guidelines

What is Firewood Heat Treatment?

- Heat treating firewood is heating firewood to a specific temperature for a designated amount of time.
- Firewood is heat treated to kill pests that could be lingering inside the wood.

What is the difference between heat treated (HT) wood and kiln dried wood?

- Heat treatments are a measure of temperature.
- Kiln dried wood measures the moisture content.

What is the Heat Treatment process?

- The treatment process includes everything used to heat treat the firewood.
- TDA is certifying the entire heat treatment process
- Typical run duration- how long the kiln is run for heat treatment
- Basket arrangement- how the wood is organized inside the kiln
- Heat source- the type of heat source used (natural gas, biomass, electricity or other heat source)
- Kiln- the structure used to heat the wood
- After certification, modifications to any of these processes would require recertification.

What are the certification requirements?

- Internal temperature reaches 60°C/60 min or 71°C/75 min
- Kiln must have a thermocouple. This is a device that allows the producer to monitor the internal temperature of the wood while the kiln is operating.
- Records of run date, the start and end time of each run and the time the required temperature was reached.
- Treated wood must be stored in a covered area at least 6" off the ground to prevent infestation of imported fire ants.
- Label of packaged sales must bear a conspicuous declaration of the following:
 1. Compliance agreement number and treatment schedule
 2. Identify the package as containing firewood, unless the contents can be easily identified through the wrapper or container
 3. Net quantity in terms of weight or measure in m³ or ft³
 4. Name and address of the manufacturer, packer, or distributor of the firewood
 5. Origin of firewood identified by county or counties and state
- Bulk sales must be accompanied by a delivery ticket or receipt containing the following information which shall remain with the original shipment or portions of shipments:

1. Compliance agreement number and treatment schedule
2. Name and address of the manufacturer, packer, or distributor who weighed or measured the firewood
3. Date delivered
4. Quantity delivered by cords or cubic meters (including fractions), or count of individually wrapped packages delivered if more than one package
5. Quantity on which the price is based, if different than the quantity delivered
6. Origin of firewood by county or counties and state

What are the steps required for certification?

The certification process has three steps beginning with a workplan for the producer, followed by a pre-inspection meeting, and then the physical inspection.

Step 1. Producer Workplan (Appendix 1)- a workplan and a diagram of the facility

Workplan should include:

- Firm name
- Address
- Phone
- Email
- Wholesale/Retail

- Transportation
- Test run results

Diagram should include:

- Kiln shape/dimensions
- Number of baskets and basket placement
- Heat source location
- Air circulation/flow

Step 2. The next step is a pre-inspection meeting.

This happens over the phone or email. The inspector will review the workplan with the producer, set up a time and date for inspection, review the requirements and prepare for the inspection.

Producer preparations:

- Using a 3/16" bit, drill 5" down the center of an average size of the densest species piece of wood (use the density chart in Appendix 2).
- Repeat until you have a piece of wood for each basket or a maximum of ten pieces.

- Spray-paint the ends of the drilled wood with a bright color. This wood will be what the inspector uses to certify the kiln.
- Do not use wood that has previously been heat treated. Inspections will not be completed with wood that has previously been run in the kiln.

Inspector preparations:

Before you arrive and while you have internet signal make sure all required temperature probes are on, logging, and have a unique ID.

Things you will need for the inspection include:

- Drill
- Drill bit
- Computer
- Computer wire for probes
- Probes
- Oven mitt or towel

Step 3. Inspection

Verify the accuracy of the workplan. Insert the temperature probes in the wood and place throughout the kiln to get a representative measurement of internal wood temperature. Diagram the placement of the probes throughout the kiln.



- Seal the kiln. Note: this step is currently optional but may be required in the future.
- Once the run is complete, remove the probes from the wood.
- Once the probes have cooled, read out the devices and stop logging.
- Save the probe charts.
- Mark the pass/fail results on the diagram and review with the producer or review the probe charts with the producer.

Passing Kiln

- If the kiln meets the heat treatment qualifications, sign a compliance agreement.
- Create a kiln report (Appendix 3) and send it to Plant Pathologist.

- Plant Pathologist will issue the compliance agreement (Appendix 4) and stamp (Appendix 5).
- Depending on the kiln results, a compliance agreement is issued for six months or one year.
- Compliance agreements have an annual fee of \$100. An invoice is sent when the agreement is issued.

Failing Kiln

- If the probes do not meet the required temperature for the set amount of time, the kiln does not pass.
- Look at the patterns in the kiln charts for issues like sudden drops in temperature, differences between probes, or damage to the kiln allowing air to escape.
- Examine air flow and possible insulation issues.
- Plan changes or adjustments for future certification.

Appendices

Appendix 1 - Heat Treated (HT) Firewood Producer Workplan

1. Name of Business:
2. Primary Contact:
3. Business Address:
4. Mailing Address:
5. Phone:
6. Email:
7. Wholesale/Retail/Both:
8. Distribution Plan (ex. delivery, pick-up):
9. How many kilns will be certified?

Table 1: Table Recording Kiln Heat Treatment Process Details

| KILN | Number of Thermocouples | Start Time | Time heat treated temperature was reached | End Time |
|------|-------------------------|------------|---|----------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |

Producer Comments:

Draw a diagram of your kiln. Please include the following information:

- Kiln shape/dimensions
- Number of baskets and basket placement
- Heat source location
- Air circulation/flow

Email the completed workplan to Plant.Certification@tn.gov

or mail to:

Tennessee Department of Agriculture

Plant Certification

P.O. Box 111359, Nashville, TN 37222-1359

Contact Tennessee Department of Agriculture Plant Certification Section for more

information: 615-837-5137

Appendix 2 - Density (lb/ft³) of Common Wood Species Used for Firewood

Table 2: Density (lb/ft³) of common hardwood species used for firewood.

| Species | Density(lb/ft ³) |
|----------------------|------------------------------|
| Ash, white | 34 |
| Basswood | 20 |
| Beech | 35 |
| Box elder | 26 |
| Cherry | 29 |
| Cottonwood | 23 |
| Dogwood | 40 |
| Elm, American | 29 |
| Sweetgum | 29 |
| Hackberry | 31 |
| Hickory/Pecan | 39 |
| Black locust | 41 |
| Maple, red (soft) | 29 |
| Maples, sugar (hard) | 31 |
| Oaks, red | 32 |
| Oaks, white | 37 |
| Sycamore | 29 |
| Yellow poplar | 25 |
| Black walnut | 32 |

Table 3: Density (lb/ft³) of common softwood species used for firewood

| Species | Density(lb/ft ³) |
|-----------------------|------------------------------|
| Hemlock | 24 |
| Redcedar | 27 |
| Southern (hard) pines | 29 |
| White (soft) pines | 21 |

Appendix 3 – Example of a Kiln Report

Kiln Report

- Fuel = Natural Gas
- Inspector: Tim Robertson

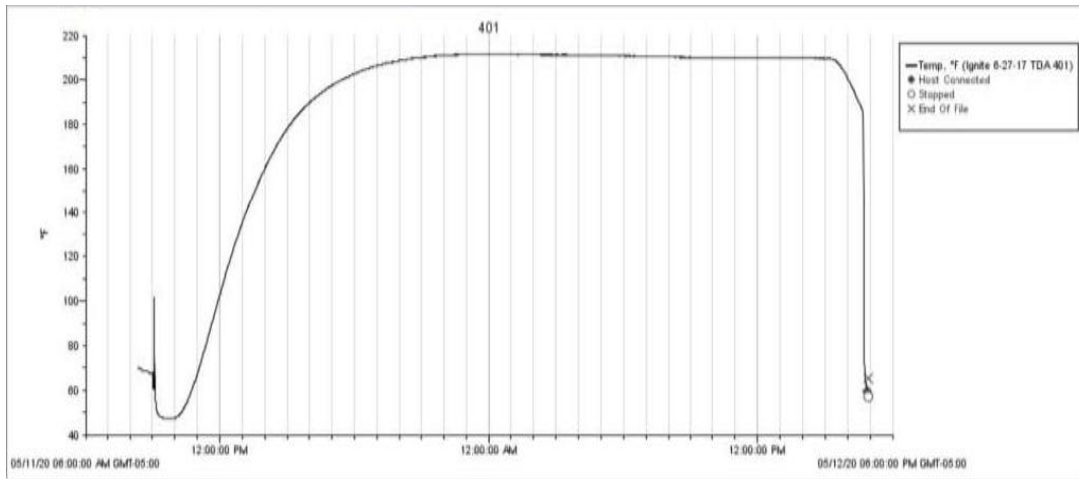


Figure 1: Temperature profile for Probe 1 (401) during kiln heat treatment

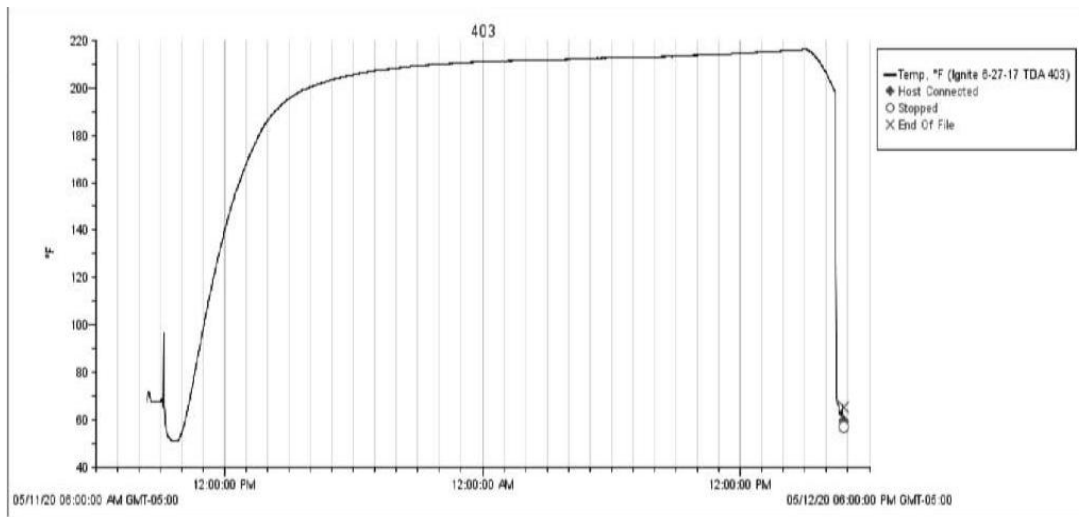


Figure 2: Temperature profile for Probe 2 (403) during kiln heat treatment

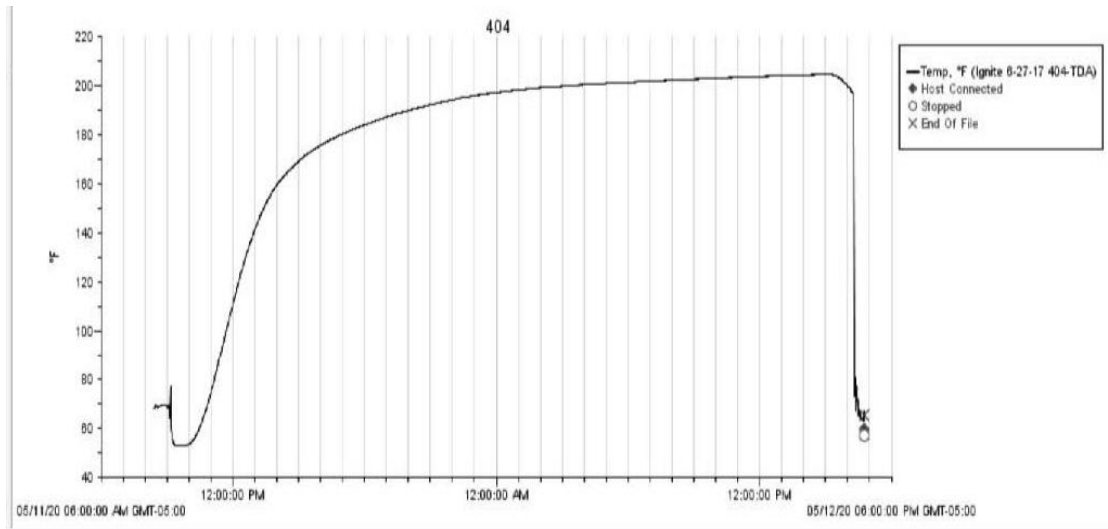


Figure 3: Temperature profile for Probe 3 (404) during kiln heat treatment

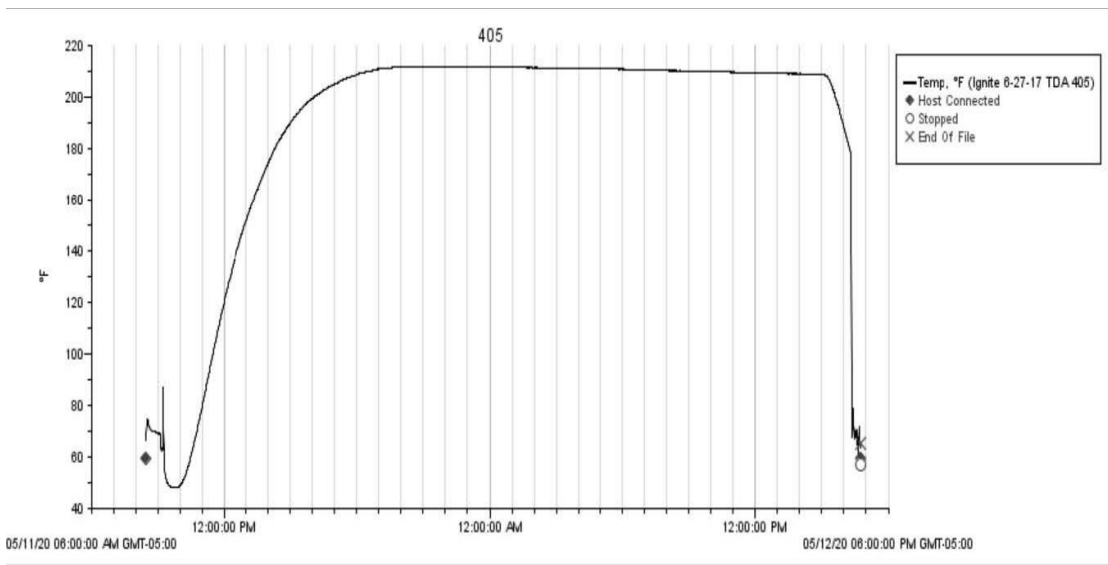


Figure 4: Temperature profile for Probe 4 (405) during kiln heat treatment

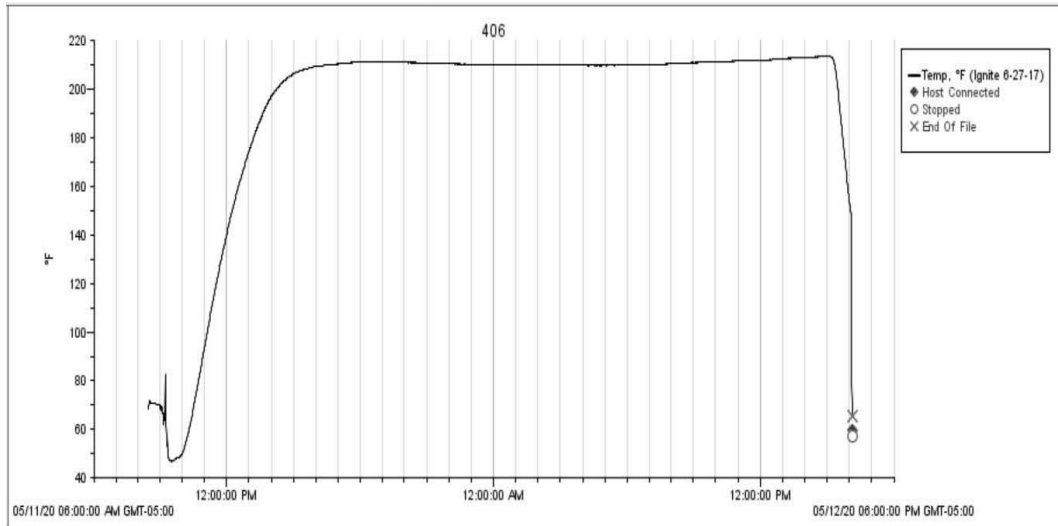


Figure 5: Temperature profile for Probe 5 (406) during kiln heat treatment

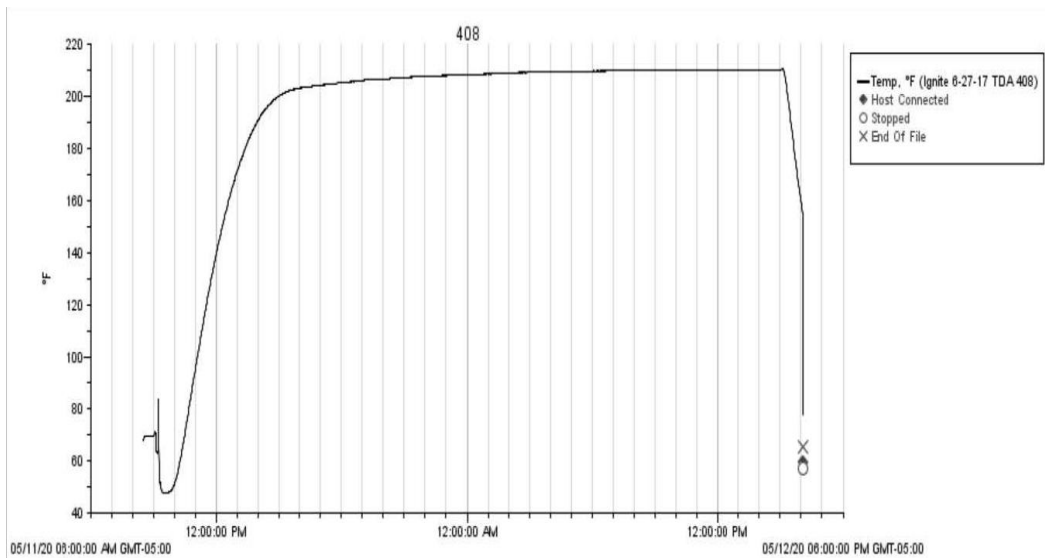


Figure 6: Temperature profile for Probe 6 (408) during kiln heat treatment

Appendix 4- Example Compliance Agreement



Tennessee Department of Agriculture Consumer and Industry Services Plant

FIREWOOD COMPLIANCE AGREEMENT

REGULATED ARTICLE(S): Firewood

STATE QUARANTINE(S) OR REGULATIONS: Agreement for Movement of Hardwood Firewood

I / we agree to handle, pack, process and move regulated articles in accordance with applicable plant quarantines; use all permits and certificates in accordance with instructions; maintain and offer for inspection such records as may be required; and abide by the following stipulations:

- To treat all regulated articles in accordance with the USDA/APHIS Plant Protection and Quarantine Treatment Manual, Treatment Schedules T314-a: Regulated Wood Articles and all Hardwood Firewood from Emerald Ash Borer quarantine areas and Treatment Schedules T314-b: All logs from Gypsy moth quarantine areas and to minimize the introduction or spread of serious plant pests known to be present in firewood or unprocessed wood products.
- To treat all regulated articles in accordance with the USDA/APHIS Plant Protection and Quarantine Treatment Manual, Treatment Schedules T314-c: Regulated Wood Articles, Various wood pest and to minimize the introduction or spread of serious plant pests known to be present in firewood or unprocessed wood products.
- To maintain and provide upon request all treatment records of regulated articles and documentation of movement of regulated articles.
- Each package must have the Tennessee emblem, agreement number, and the statement that this firewood has been heat treated.

That in authorizing and participating in these treatments/requirements as a basis for the certification of the regulated articles no liability shall be attached either to the Tennessee Department of Agriculture, or to any of their employees in the event of injury to the property or the regulated articles.

Company Representative

Company Representative Signature

Tennessee Department of Agriculture | Division of Consumer & Industry Services

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Date

Compliance Agreement Number

Effective Date

Expiration Date

Tennessee State Plant Regulatory Official

Appendix 5 - Compliance Stamp Example

Each year a new stamp is issued to the producer. Three items included on the stamp:

- Heat treatment
- Firm
- Certification number: State-Program Abbreviation-Year-number



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