

Forestry Emerald Ash Borer – Industry Note August 2009

EAB Sterilization Treatments for Ash Lumber, Firewood and Logs

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The information contained in this fact sheet describes the requirements and procedures for kiln sterilization, fumigation, and heat treatment methods that can be used to sterilize green lumber, firewood, and logs that meet the requirements for shipping out of an Emerald Ash Borer (EAB) quarantine area. If ash wood and wood products are not sterilized using one of these above methods, the products must be processed into:

- chips smaller than 1" x 1" (typical pulpwood chips)
- debarked (removing all bark plus an additional ½" of material)
- wane free lumber (all square edges, no corners void of lumber); it **may be** possible for wane exceptions to be written into a compliance agreement if the logs are going to be debarked and an additional ½" of material removed before sawing into lumber

Since these methods are fairly straight forward, this fact sheet covers the sterilization treatments that are more technically involved including kiln sterilization, fumigation, and heat treatments which have specific procedures and schedules that must be followed in order to meet APHIS and the State Entomology's Office requirements. Sterilization methods become important when applying for certificates or when receiving ash materials from an EAB quarantined area (see Forestry EAB - Industry Note July 2009 for detailed information on quarantine compliance agreements and certificates). These treatment schedules, if required, will be written into your compliance agreement.

Compliance agreements are NOT required when:

- Ash wood products (logs, lumber, chips, and hardwood firewood) are moved within the Kentucky Quarantine Zone.
- The handling of ash materials is completed outside the quarantine area (i.e. cutting, hauling, milling, etc.).
- Ash materials from outside the quarantined area are moved into the quarantine area

Kiln Sterilization Treatment Schedule

(Used primarily for treating green lumber)

Treatment: T404-b-4 Kiln Sterilization

Dry Bulb temperatures	Wet Bulb depression	Relative humidity	Moisture content	Thickness of lumber	Exposure time
140 ⁰ F	7 ⁰ F	82%	13.8%	1 inch 2 inches 3 inches	3 hrs 5 hrs 7 hrs
130 ⁰ F	16 ⁰ F	60%	9.4%	1 inch 2 inches	10 hrs 12 hrs

3 inches

14 hrs

- 1) After kiln drying, the wood will be checked with a moisture meter to verify the wood is at or below the appropriate moisture content listed above. Two readings will be taken per stack of wood: one near the top of the stack and one near the bottom of the stack. These reading will be recorded in a computer database along with the date and time. This database information will be supplied to USDA, APHIS, PPQ on a monthly basis.
 - 2) If the wood does not meet moisture content guidelines, it will NOT be in compliance unless it undergoes additional kiln drying and can then demonstrate that the moisture requirement has been met.
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Fumigation Treatment Schedule

(Used primarily for treating veneer logs)

Treatment: T404-b-1-1 MB at NAP-tarpaulin or chamber

Temperature	Dosage Rate (lb/1,000 ft ³)	Minimum Concentration Readings (ounces) At:			
		0.5 hr	2 hr	4 hr	16 hr
70°F or above	3 lbs	36	30	27	25
40-69°F	5 lbs	60	51	46	42

- 1) The fumigation must be performed by a licensed fumigator.
 - 2) The licensed fumigator must have a fumigator compliance agreement with United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine.
 - 3) Review the treatment schedule for specific fumigation guidelines.
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Heat Treatment Schedule

(Used primarily for treating firewood)

Treatment: T314-a Heat treatment

- 1) Heat treatment procedures may employ steam, hot water, kilns, or any other method that raises the temperature of the **center** of the wood to at least 160°F (71.1°C) and maintains the center temperature for at least 75 minutes.
- 2) Facilities, temperature monitors and temperature sensors will be approved by CPHST (Center for Plant Health and Science Technology) prior to a compliance agreement being initiated.

- 3) Compliance agreements must contain a diagram of the treatment facility to include at a minimum: dimensions, capacity, circulation fans, heat input location, and door locations.
 - 4) The temperature monitoring equipment (thermocouples, temperature data loggers etc) must be accurate to within +/- 0.5 °C (0.9 °F) at the treatment temperature, capable of collecting temperature data at least once every five (5) minutes and recording or storing data for 30 days. The temperature monitoring equipment must also be calibrated (by a source that can provide accreditation such as NIST) prior to facility certification tests and a minimum of once an annually thereafter. In addition, if a permanent temperature recording system is used, the system must be recalibrated when any part or portion of the system is repaired or replaced.
 - 5) Temperature monitoring equipment must be able to provide a record of the treatment that identifies each sensor and indicates time and temperature.
 - 6) Internal wood temperatures shall be obtained and verified by sensors located in the larger pieces of firewood at representative locations within the stack. The number of temperature sensing elements required per load will vary with the size of the load. The minimum requirement is four (4) sensors – one (1) for measuring air temperature and three (3) for measuring internal wood temperature. For loads greater than 5,000 ft³ (142 m³) of wood, a minimum of one additional sensor for measuring internal wood temperature must be provided for each additional 2,000 ft³. For example, a load of 9,000 ft³ would require a total of six (6) sensors (one ambient air temperature sensor and five [3 + 2 additional sensors]). At least one sensor shall be placed in a large firewood piece in a portion of the load furthest away from initial heat circulation. Sensors will be placed in the wood in pre-drilled holes to measure core wood temperature. Probes are to be sealed into each hole with putty (electricians putty is recommended) to prevent reading ambient air temperature. Other recording arrangements may be considered if approved by CPHST.
 - 7) Begin treatment when **all** the temperature sensors reach the threshold temperature of 160° F (71.1° C). Treatment will be complete when all temperature probe readings are at or above the threshold temperature for the entire 75 minutes.
 - 8) Temperature equipment will be certified by USDA APHIS PPQ personnel at regular intervals (suggested monthly) except in those cases where a facility is inactive in excess of 2 months. Certification will occur before production activities resume.
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For additional information:

- KYs quarantine, movement of firewood: Kentucky State Entomologist Office (859) 257-5838
- Quarantine in KY as it relates to forest industry: Forestry EAB Industry Fact Sheets at the University of Kentucky Forestry Extension web site: www.ukforestry.org

- all aspects of EAB and the quarantine in Kentucky:
<http://pest.ca.uky.edu/EXT/EAB/welcome.html>
- overall information on the emerald ash borer insect: www.emeraldashborer.info/