

APPENDICES

SCHEDULE "A": CLSAB POLICY FOR PRODUCT STANDARDS APPROVAL

GENERAL

Responsibility for this policy is vested in the Board of Directors of the CLSAB. Revisions may be recommended by the Canadian Lumber Standards Operations Committee (CLSOC) or any other duly appointed committee of the CLSAB.

Responsibility for the evaluation, application and interpretation of this policy is vested in the CLSOC or any other committee so appointed by the Board of Directors of CLSAB. This policy is for use in approving Product Standards that are utilized by CLSAB accredited Grading Agencies as provided for in the CLSAB Regulations - Sect. 2.

For the purpose of this document a Product Standard is a prescribed set of performance requirements or combination thereof that describes or define a given product. Present examples of approved CLSAB Product Standards are:

- SPS 1: NLGA Special Products Standard for Fingerjoined Structural Lumber
- SPS 2: NLGA Special Products Standard for Machine Stress Rated Lumber
- SPS 3: NLGA Special Products Standard for Fingerjoined Stud Lumber - Vertical Use Only

APPLICATION

The application for CLSAB approval of a Product Standard shall be submitted to the President & CEO of the CLSAB. The application shall include the following:

- i) A statement indicating the means of financing the continued maintenance of the Product Standard.
- ii) Provisions for periodic review, revision, renewal or withdrawal of the Product Standard.
- iii) An indication that the Product Standard will be made available at a reasonable cost to anyone desiring a copy.
- iv) A description of how the Product Standard was prepared and how it represents a consensus as to the best available current information.
- v) An indication of any other similar or related Product Standards including identification of differences and or similarities.
- vi) An explanation of the National Status of the Product Standard such as extent of the need and use in Canada.

REQUIREMENTS OF PRODUCT STANDARDS

The Product Standard shall include the following:

- a) A statement of the objective and use of the Product Standard.
- b) A reference to the approval of the CLSAB.
- c) Clearly stated and explicit requirements that can be readily enforced.
- d) Provisions for certification and product marking or identification.
- e) Provisions for reinspection
- f) An explanation of the procedure for obtaining interpretations.

- g) The reference date of acceptance of the last revision and identification of any and all previous editions.

FORMAT OF PRODUCT STANDARDS

- 1) The Product Standard shall be structured in general conformance with the following:
- 2) Title
- 3) Approval - Date, CLSAB
- 4) Scope
- 5) Terminology
- 6) Specifications - Product, Equipment
- 7) Procedures for - Qualification, Quality Control
- 8) Provisions for - Grade Stamping or other Certification marking, Reinspection
- 9) Referenced Documents - List
- 10) Annexes and Appendices

COMMENTARY (RATIONALE)

The inclusion of a commentary or rationale section is required to ensure that brief and concise documentation is available to the user to provide traceability of the Product Standard and clarification of past commentary. This shall include:

- i) brief history of the development of a new Product Standard or revision to an existing standard including when and why the endeavor was initiated; and
- ii) reasons and justification for various requirements. Most important is detailing the basis of technical requirements.

SCHEDULE "B": CLSAB POLICY FOR LUMBER GRADING MACHINE APPROVAL**0. GENERAL**

- 0.1 Responsibility for this Policy is vested in the Board of Directors of the CLSAB.
- 0.2 Revisions may be recommended by the Canadian Lumber Standards Operations Committee (CLSOC) or any other appointed committee of the CLSAB.
- 0.3 Additional or modified requirements may be recommended by the CLSOC or any other appointed committee of the CLSAB to ensure consistent application of:
 1. The intent of this Policy to novel grading machines, and
 2. The intent of the CLSAB approved product standard for mechanically graded lumber.¹
- 0.4 Responsibility for evaluation, application and interpretation of this Policy is vested in the CLSOC or any other committee duly appointed by the Board of Directors.

1. SCOPE

- 1.1 This Policy outlines CLSAB criteria for approving mechanical devices (hereinafter referred to as "machine(s)") used a lumber grading process that is under the supervision of a CLSAB accredited grading agencies (hereinafter referred to as the "Agency").
- 1.2 This Policy outlines performance requirements for machines that operate by measuring one or more mechanical or physical wood properties (hereinafter referred to as "indicating properties"), which are used to segregate lumber into classes for purposes of assigning characteristic strength values.
- 1.3 This Policy and the machines approved under this Policy are to be used only in conjunction with a CLSAB approved product standard for mechanically graded lumber (e.g. NLGA SPS2).
- 1.4 This Policy does not apply to mechanical devices used to apply visual grading rules (e.g. NLGA Standard Grading Rules Para. 124).

2. AGENCY RESPONSIBILITIES

- 2.1 The Agency shall be responsible for verifying that the testing and evaluation are carried out as described in the application for approval and in accordance with the requirements of this Policy.
- 2.2 The Agency, upon machine approval, shall ensure that each machine is installed and operated in accordance with the manufacturer's specifications, and any additional requirements identified by this Policy.
- 2.3 Machines shall only be operated in association with a quality control program approved by the Agency for the specified facility and machine.

3. APPLICATION

- 3.1 Application for machine approval shall only be submitted to the CLSAB by an Agency.
- 3.2 The application shall include the following:
 - a) An explanation of the type of machine(s) for which approval is desired and a description of how the machine operates including: installation requirements; maintenance and operating instructions; the frequency, extent and procedures for calibration; property

¹ This includes undertaking lumber testing programs to demonstrate that the lumber grading machine and accompanying visual grading requirements produces lumber that has mechanical property relationships (e.g. tension to bending) that is consistent with that published in the CLSAB approved product standard.

- compensating devices or algorithms²; and the environmental conditions in which the machine will be operating.
- b) The operating range of physical lumber properties over which the machine is capable of segregating with the stated precision including: strength, stiffness, density, sizes (thickness, width and length), surface finish, moisture content, and dimensional variations (i.e. warp).
 - c) For the range of lumber lengths stated in 3.2b), a plot shall be prepared showing the frequency at which each cross-section in a piece of lumber appears in the measurement region³ that is tested for the indicating properties. The test frequency zones⁴, designated as A to D, shall be identified.
 - d) Evidence that the machine's throughput process will not alter the mechanical and physical properties of the lumber.
 - e) A detailed report of the testing program, quality and condition of the sample(s) used, and how the results are interpreted to establish the accuracy and precision of the machine within the operating range stated in 3.2b).⁵
 - f) A machine specific operations Guide developed in accordance with the requirements of and for use in conjunction with the CLSAB approved standard (e.g. NLGA SPS2).⁶ The Guide shall provide, if applicable:
 - i) Additional visual grading requirements;
 - ii) Additional restrictions to qualification and quality control procedures⁷; and
 - iii) Other information necessary to apply the product standard.⁸
 - g) The manufacturer's procedures for documenting and releasing updates/upgrades to the equipment, and operating and maintenance procedures.

4. VERIFICATION

4.1 The applicant shall provide evidence to support the following:

² These include mechanical and electrical devices used to adjust, for example, the measured property for feed speed, temperature, moisture content, or lumber orientation.

³ The "measurement region" is the length, area or volume of lumber that is in the test zone when the indicating properties are determined. For example, in the case of bending type machines, the measurement region is the test span.

⁴ This map shall be used to define the "Untested" and "Partially Tested" portions in a piece, and will be used with the "Visual Grading of Untested Portions". For a given length, Zone "A" is defined as those portions tested at the maximum frequency; Zone "D" as those portions that are not tested; Zone "B" as partially tested areas with test frequency at 50% or more of Zone "A"; and Zone "C" as partially tested areas with test frequency between that of Zone "B" and "D".

⁵ The lumber sample should be representative of or cover the range of lumber quality and characteristics normally processed in a mill. Consideration should be given to the wood species mix, moisture content variations within and between pieces, and wood density. It may be necessary develop a matrix of sub-samples that covers the range of lumber quality and characteristics.

⁶ The guide shall form part of the facilities plant standard.

⁷ This may include, for example, a restriction on the range of lumber length that can be covered in a single qualification test. Traditionally, an "Item" is defined as lumber of a given grade, size, species group and moisture content without reference to length.

⁸ This may include, for example, a description of "Fine-tuning" that is consistent with the intent of the CLSAB approved product standard for mechanically graded lumber.

- a) That the machine is capable of consistently sorting a lumber population described in 3.2(b) into grade classifications that will satisfy the requirements of the CLSAB approved standard (e.g. the NLGA SPS2) to which the lumber will be produced.
- b) That the machine is be capable of measuring the indicating property or properties with sufficient frequency over the length of the piece such that the stated accuracy and precision is maintained over the range of lumber sizes described in 3.2(b).
- c) That visual grade rules have been provided to ensure strength-reducing grade characteristics found in the “Untested” (Zone D) or “Partially Tested” (Zones B and C) sections of the lumber piece do not exceed those found in the “Fully-tested” portions (Zone A).⁹
- d) That the “untested” (Zone D) sections of any piece do not exceed 750 mm in length.¹⁰
- e) That the machine is capable of relating each of its indicating property measurements to pre-set boundary levels corresponding to individual stress grades, and marking each piece of lumber to indicate the grade determined by the machine.
- f) That the machine measurements of each indicating property is within $\pm 1\%$ of the actual indicating property over the upper 95% of the operating range, and can be maintained within $\pm 2\%$ of the actual indicating property while in operation.¹¹
- g) That the standard properties predicted from the indicating properties are within $\pm 3\%$ of the actual standard property¹² over the upper 95% of the operating range for Type I machines, within $\pm 5\%$ for Type II machines, and within $\pm 10\%$ for Type III machines.¹³
- h) That the indicating property or properties recorded for any piece of lumber from within the operating range are within $\pm 3\%$ of the mean value for that indicating property and piece of lumber, with a minimum 95% confidence level when repeatedly passed through the machine.¹⁴

4.2 CLSAB may employ consultants to assist in evaluating the application for approval of machines. The applicant Agency will be responsible to CLSAB for any fees and expenses incurred by the consultant(s).

⁹ A “Partially Tested” section is defined as a section where the frequency of testing for the mechanical and/or physical property is less than that the maximum for the piece (e.g. Zones B and C). An “Untested” section is defined as a section where the mechanical and/or physical property is not measured (e.g. Zone D).

¹⁰ Future policies may consider how often Zone D appears in a piece and how they are spaced within a piece.

¹¹ For the indicating properties, the machine must be capable of being calibrated to within $\pm 1\%$ when installed and maintained at $\pm 2\%$ when in operation. These specifications are consistent with that of load cells used in bending proof-loading test equipment at MSR facilities.

¹² At this time, the “standard property” is the edgewise-bending modulus of elasticity at 15% moisture content and tested at a span-to-depth of 21:1. This definition may be extended to other relevant property such as modulus or rupture or ultimate tensile strength.

¹³ This clause examines the correlation between the “indicating property” and a “standard property”. The intent is for “Type I” machines to be contact type machines that measure bending stiffness (the baseline machine can be the Metriguard CLT or similar), and “Type II” or “Type III” machines to be non-contact type machines that measures one or properties to estimate the bending stiffness (the baseline machine can be the CAE-Newnes XLG or similar). The machine “Type” is not an indication of the reliability of the machine.

¹⁴ This clause assesses the repeatability and reproducibility of the machine (i.e. variations in results from using the same equipment in the same facility). Typically, fine-tuning based is limited to $\pm 3\%$ of the grade boundary settings.

SCHEDULE "C": CLSAB POLICY FOR GRADING AGENCY VERIFICATION OF HEAT CHAMBERS**GENERAL**

This policy establishes minimum criteria to be used by agencies to verify that equipment and heat treating schedules meet the minimum time and temperature requirements defined in the NLGA Standard Grading Rules for Canadian Lumber - Paragraph 715 HEAT TREATMENT.

Responsibility for this policy is vested in the Board of Directors of the CLSAB. Revisions may be recommended by the Canadian Lumber Standards Operations Committee (CLSOC) or any other appointed committee of the CLSAB.

Responsibility for evaluation, application and interpretation of this policy is vested in the CLSOC or any other committee duly appointed by the Board of Directors.

a) REQUIREMENTS FOR THE QUALIFICATION OF A FACILITY:

- 1) All equipment must be in proper working condition.
- 2) The agency shall verify that:
 - i) the heat treating schedules and heat treatment chambers meet the General Conditions of Section (c)(1) and the Specific Heat Treatment Chamber Operating Conditions for Generic Schedules of Section (c)(2) or Section (c)(3) of this policy;or,
 - ii) the specific schedule used by the facility achieves a minimum core temperature of 56° C for a minimum of 30 minutes. The agency shall require that thermocouple(s) be properly located to accurately measure the temperature achieved in the heat chamber. The process for verifying the core temperature must be specified in the facility's quality manual and approved by CLSAB.
- 3) The agency shall require each facility with or without heat treatment chambers to develop a quality manual of the facility's quality system procedures and it shall review and approve each manual. The quality manual shall include:
 - i) a procedure that confirms proper operation of the treatment chamber during heat treatment.
 - ii) procedures for dealing with failure or deficiencies in equipment operation including heat sensors, fans, etc.
 - iii) facilities without heat treatment chambers shall specify in their Quality Manual procedures for segregation of non KD-HT and/or HT products. In addition facilities that purchase material from agency certified KD-HT or HT facilities, rework this material and subsequently mark this material KD-HT or HT; each facility shall maintain an agency approved systematic method of keeping records that identifies if the volumes of KD-HT or HT facilities are adequate to produce the quantities of KD-HT or HT material that are being labeled.

b) MONITORING

- 1) Agencies shall require facilities to monitor temperatures throughout the heat treatment cycle by any of the following options:
 - i) wet and dry bulb temperature
 - ii) dry bulb only
 - iii) direct measurement of wood core temperatures

- 2) If a facility is not in operation for a period of 6 months or longer, the facility must specify steps used in ensuring that the equipment is in normal operating condition before beginning treatments.

c) HEAT TREATMENT CHAMBER OPERATING CONDITIONS AND SCHEDULES

1) General Conditions

The following heat treatment chamber operating conditions apply to all generic schedules, Options A, B, C, D, E & F.

GENERAL HEAT TREATMENT CHAMBER OPERATING CONDITIONS
A minimum air flow of 0.5 meters/second (100 feet/ minute), (measured on the air exit side of the chamber of the load) is required. A zone is an area of 5m (16 feet) long by 2.5m (8 feet) high.
Lumber must be stacked on stickers no less than 9.5mm (3/8 inches) in thickness and in a manner to provide adequate air flow. Wood packaging or other wood products may be piled in a manner to provide good air circulation through and over all wide surfaces of individual boards.
Dry and wet bulb measuring system must accurately measure the temperature within 2.5° C (4.5° F). The verification of the measuring system will be required on an annual basis. This requirement may be removed where the temperature exceeds the requirement for option A-B-D-E-F by at least 5° C and by at least 10° C for option C.
When wet-bulb temperature is monitored, at least 1 wet-bulb temperature sensor that directly measures wet-bulb temperature or provides information from which wet-bulb temperatures can be recorded must be present and in its appropriate location. The system should record temperatures at a minimum of every 30 minutes.

- 2) Specific Heat Treatment Chamber Operating Conditions for Generic Softwood Schedules, Options A, B, C & D

These schedules apply only to native Canadian coniferous (softwood) species grown in Canada and the following deciduous (hardwood) genus/species grown in Canada - aspen (Populus tremuloides), poplar (Populus spp.), Manitoba maple (Acer negundo), basswood (Tilia americana) and red alder (Alnus rubra).

Option A: Heat Treatment without Moisture Reduction

HEAT TREATMENT CHAMBER OPERATING CONDITIONS FOR OPTION A								
Both wet-bulb and dry bulb temperatures are measured.								
Dry bulb temperature sensors must be located on at least one side of the heat treatment chamber and spaced not more than 7 metres (24 feet) apart, with one located no more than 2.5 m (8 feet) from each end of the treatment chamber. The number of dry bulb sensors required will depend on the length of the individual kiln and the above sensor placement scale. The temperatures must be recorded at a minimum of every 30 minutes.								
At least one wet bulb temperature sensor, either measuring wet bulb temperature or providing data to determine the wet bulb temperature must be located near the mid third of the treatment chamber, on any one side. Temperatures must be recorded at a minimum of every 30 minutes.								
Air flow should occur in each two opposite directions within the treatment chamber for half of the time specified at a temperature equal to or exceeding the wet bulb temperature run time (see tables for each option). This requirement may be modified where it can be technically proven by a recognized heat treatment evaluator and when other measures can compensate for deviation. This deviation will be referred to the CLSAB/CFIA Joint Technical Committee for review. Any modifications must be included in the quality manual and account for all the processes used to ensure that the phytosanitary standard is being met.								
The pre-schedule wood core temperature must be equal to or greater than 15°C in order to use the generic schedule for Option A. The pre-schedule wood core temperature can be determined by direct measurement of the wood core temperature or by using the previous night's low temperature as the wood core temperature.								
<p>At wood core temperatures below 15°C the facility must have specifications in the quality manual to pre-heat the wood until the core temperature of at least one piece of lumber of the thickest nominal size reaches 15°C, before starting the generic schedule. Alternatively, the following temperature adjustments may be made:</p> <table style="margin-left: 40px;"> <tr> <td>For wood core temperatures below 15°C,</td> <td>add the temperature adjustment to the "Minimum Heat Treatment Run Time".</td> </tr> <tr> <td>Over 60mm (2¼") to 85 mm (3¼").....</td> <td>add 10.0 minutes per 1°C (5.6 minutes per 1 °F)</td> </tr> <tr> <td>Over 85mm (3¼") to 110 mm (4¼").....</td> <td>add 15.3 minutes per 1°C (8.5 minutes per 1 °F)</td> </tr> <tr> <td>Greater than 110 mm (4 1/4 inches).....</td> <td>Adjustment not available. Direct core measurement is required.</td> </tr> </table> <p>Pre-schedule wood core temperature verification and the pre-heating process is not required for pieces of wood less than or equal to 60 mm (2-1/4 inches)</p>	For wood core temperatures below 15°C,	add the temperature adjustment to the "Minimum Heat Treatment Run Time".	Over 60mm (2¼") to 85 mm (3¼").....	add 10.0 minutes per 1°C (5.6 minutes per 1 °F)	Over 85mm (3¼") to 110 mm (4¼").....	add 15.3 minutes per 1°C (8.5 minutes per 1 °F)	Greater than 110 mm (4 1/4 inches).....	Adjustment not available. Direct core measurement is required.
For wood core temperatures below 15°C,	add the temperature adjustment to the "Minimum Heat Treatment Run Time".							
Over 60mm (2¼") to 85 mm (3¼").....	add 10.0 minutes per 1°C (5.6 minutes per 1 °F)							
Over 85mm (3¼") to 110 mm (4¼").....	add 15.3 minutes per 1°C (8.5 minutes per 1 °F)							
Greater than 110 mm (4 1/4 inches).....	Adjustment not available. Direct core measurement is required.							

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION A			
Lumber Thickness	Minimum Heat Treatment Run Time ¹	Wet Bulb Temperature Run Time > 60°C (140°F) ²	Minimum Final Wet-Bulb Temperature
Up to 60 mm (2 1/4 inches)	6 hrs, 26 mins.	2 hrs, 3 mins.	63°C (145°F)
Up to 85 mm (3 1/4 inches)	7 hrs, 20 mins.	3 hrs, 20 mins.	66°C (151°F)
Up to 110 mm (4 1/4 inches)	10 hrs, 57 mins.	6 hrs, 34 mins.	67°C (153 °F)

Note: ¹ The pre-schedule wood core temperature of at least one piece of wood must be at least 15°C before the treatment run time is measured (see table of "Heat Treatment Chamber Operating Conditions for Option A" above for verification procedures for wood core temperature)

Note: ² "Wet Bulb Temperature Run Time" is the continuous portion of the heat treatment time where the wet bulb temperature measures > 60°C, measured in hours

Generic Phytosanitary Heat Treatment Schedules for Softwood Timbers Thicker Than 110mm (5 inch nominal)

(Options A-1 to A-6)

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION A-1			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time ≥ 70°C/(158°F) ¹	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	9 hrs, 38 minutes	5 hrs, 8 minutes	70°C (158°F)
Up to 152 mm (6 inches)	11 hrs, 16 minutes	6 hrs, 46 minutes	70°C (158°F)
Up to 178 mm (7 inches)	13 hrs, 14 minutes	8 hrs, 44 minutes	70°C (158°F)
Up to 203 mm (8 inches)	15 hrs, 37 minutes	11 hrs, 7 minutes	70°C (158°F)
Up to 228 mm (9 inches)	18 hrs, 25 minutes	13 hrs, 55 minutes	70°C (158°F)
Up to 254 mm (10 inches)	21 hrs, 44 minutes	17 hrs, 14 minutes	70°C (158°F)
Up to 279 mm (11 inches)	25 hrs, 36 minutes	21 hrs, 6 minutes	70°C (158°F)
Up to 305 mm (12 inches)	30 hrs, 4 minutes	25 hrs, 34 minutes	70°C (158°F)

Note ¹: During the "Wet bulb temperature run time", the Dry Bulb temperature must equal or exceed 71°C (160°F)

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION A-2			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time $\geq 69^{\circ}\text{C}/(156^{\circ}\text{F})$¹	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	11 hrs, 10 minutes	6 hrs, 40 minutes	69°C (156 °F)
Up to 152 mm (6 inches)	12 hrs, 16 minutes	8 hrs, 46 minutes	69°C (156°F)
Up to 178 mm (7 inches)	15 hrs, 49 minutes	11 hrs, 19 minutes	69°C (156°F)
Up to 203 mm (8 inches)	18 hrs, 52 minutes	14 hrs, 22 minutes	69°C (156°F)
Up to 228 mm (9 inches)	22 hrs, 29 minutes	17 hrs, 59 minutes	69°C (156°F)
Up to 254 mm (10 inches)	26 hrs, 44 minutes	22 hrs, 14 minutes	69°C (156°F)
Up to 279 mm (11 inches)	31 hrs, 41 minutes	27 hrs, 11 minutes	69°C (156°F)
Up to 305 mm (12 inches)	37 hrs, 24 minutes	32 hrs, 54 minutes	69°C (156°F)

Note¹: During the “Wet bulb temperature run time”, the Dry Bulb temperature must equal or exceed 71°C (160°F).

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION A-3			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time $\geq 68^{\circ}\text{C}/(154^{\circ}\text{F})$¹	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	12 hrs, 18 minutes	7 hrs, 48 minutes	68°C (154 °F)
Up to 152 mm (6 inches)	14 hrs, 45 minutes	10 hrs, 15 minutes	68°C (154 °F)
Up to 178 mm (7 inches)	17 hrs, 44 minutes	13 hrs, 14 minutes	68°C (154 °F)
Up to 203 mm (8 inches)	21 hrs, 17 minutes	16 hrs, 47 minutes	68°C (154 °F)
Up to 228 mm (9 inches)	25 hrs, 30 minutes	21 hrs	68°C (154 °F)
Up to 254 mm (10 inches)	30 hrs, 26 minutes	25 hrs, 56 minutes	68°C (154 °F)
Up to 279 mm (11 inches)	36 hrs, 11 minutes	31 hrs, 41 minutes	68°C (154 °F)
Up to 305 mm (12 inches)	42 hrs, 49 minutes	38 hrs, 19 minutes	68°C (154 °F)

Note¹: During the “Wet bulb temperature run time”, the Dry Bulb temperature must equal or exceed 71°C (160°F).

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION A-4			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time $\geq 67^{\circ}\text{C}/(152^{\circ}\text{F})^1$	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	13 hrs, 14 minutes	8 hrs, 44 minutes	67°C (152°F)
Up to 152 mm (6 inches)	15 hrs, 59 minutes	11 hrs, 29 minutes	67°C (152°F)
Up to 178 mm (7 inches)	19 hrs, 18 minutes	14 hrs, 48 minutes	67°C (152°F)
Up to 203 mm (8 inches)	23 hrs, 16 minutes	18 hrs, 46 minutes	67°C (152°F)
Up to 228 mm (9 inches)	27 hrs, 58 minutes	23 hrs, 28 minutes	67°C (152°F)
Up to 254 mm (10 inches)	33 hrs, 29 minutes	28 hrs, 59 minutes	67°C (152°F)
Up to 279 mm (11 inches)	39 hrs, 53 minutes	35 hrs, 23 minutes	67°C (152°F)
Up to 305 mm (12 inches)	47 hrs, 17 minutes	42 hrs, 47 minutes	67°C (152°F)

Note¹: During the “Wet bulb temperature run time”, the Dry Bulb temperature must equal or exceed 71°C (160°F).

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION A-5			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time $\geq 66^{\circ}\text{C}/(150^{\circ}\text{F})^1$	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	14 hrs, 3 minutes	9 hrs, 33 minutes	66°C (150°F)
Up to 152 mm (6 inches)	17 hrs, 2 minutes	12 hrs, 32 minutes	66°C (150°F)
Up to 178 mm (7 inches)	20 hrs, 39 minutes	16 hrs, 9 minutes	66°C (150°F)
Up to 203 mm (8 inches)	24 hrs, 59 minutes	20 hrs, 29 minutes	66°C (150°F)
Up to 228 mm (9 inches)	30 hrs, 7 minutes	25 hrs, 37 minutes	66°C (150°F)
Up to 254 mm (10 inches)	36 hrs, 7 minutes	31 hrs, 37 minutes	66°C (150°F)
Up to 279 mm (11 inches)	43 hrs, 5 minutes	38 hrs, 35 minutes	66°C (150°F)
Up to 305 mm (12 inches)	51 hrs, 9 minutes	46 hrs, 39 minutes	66°C (150°F)

Note¹: During the “Wet bulb temperature run time”, the Dry Bulb temperature must equal or exceed 71°C (160°F).

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION A-6			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time $\geq 64^{\circ}\text{C}/(148^{\circ}\text{F})$ ¹	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	14 hrs, 46 minutes	10 hrs, 16 minutes	64°C (148°F)
Up to 152 mm (6 inches)	17 hrs, 59 minutes	13 hrs, 29 minutes	64°C (148°F)
Up to 178 mm (7 inches)	21 hrs, 52 minutes	17 hrs, 22 minutes	64°C (148°F)
Up to 203 mm (8 inches)	26 hrs, 31 minutes	22 hrs, 1 minute	64°C (148°F)
Up to 228 mm (9 inches)	32 hrs, 1 minute	27 hrs, 31 minutes	64°C (148°F)
Up to 254 mm (10 inches)	38 hrs, 28 minutes	33 hrs, 58 minutes	64°C (148°F)
Up to 279 mm (11 inches)	45 hrs, 36 minutes	50 hrs, 60 minutes	64°C (148°F)
Up to 305 mm (12 inches)	54 hrs, 36 minutes	50 hrs, 6 minutes	64°C (148°F)

Note¹ : During the “Wet bulb temperature run time”, the Dry Bulb temperature must equal or exceed 71°C (160°F).

Option B and B-1: Heat Treatment with Moisture Reduction (Option B) and Without Moisture Reduction (Option B-1)

<p>HEAT TREATMENT CHAMBER OPERATING CONDITIONS FOR OPTION B</p>
<p>This option can be used by a facility to heat treat the wood during the kiln drying process in order to reduce the moisture content below the fiber saturation point of the wood (approximately 30% MC).</p>
<p>Both wet-bulb and dry bulb temperatures are measured.</p>
<p>The heat treatment chamber must be equipped with at least one dry-bulb temperature sensor. If the air entering/ air exiting plenum is divided into three equal length segments, the temperature sensor(s) must be located as follows: At least one dry-bulb temperature sensor will be located within the mid-third segment of the kiln (on either side). If this condition is met, location of other sensors is not restricted. In lieu of a dry-bulb temperature sensor within the mid-third of the kiln, the kiln can be operated with two (or more) dry-bulb temperature sensors with at least one sensor located in each of the segments located at opposite ends of the kiln (on either side). The dry bulb(s) temperature must exceed the wet bulb temperature during the heat treatment to ensure the uniformity of the heat treatment chamber conditions. Temperatures must be recorded at a minimum of every 30 minutes</p>
<p>At least one dry bulb temperature sensor must be located near the mid third of the heat treatment chamber, on any one side. The temperatures must be recorded at a minimum of every 30 minutes.</p>
<p>At least one wet bulb temperature sensor, either measuring wet bulb temperature or providing data to determine the wet bulb temperature must be located near the mid third of the treatment chamber, on any one side. Temperatures must be recorded at a minimum of every 30 minutes.</p>
<p>Air flow should occur in each two opposite directions within the treatment chamber for half of the time specified at a temperature equal to or exceeding the wet bulb temperature run time (see tables for each option). This requirement may be modified where it can be technically proven by a recognized heat treatment evaluator and when other measures can compensate for deviation. This deviation will be referred to the CLSAB/CFIA Joint Technical Committee for review. Any modifications must be included in the quality manual and account for all the processes used to ensure that the phytosanitary standard is being met.</p>
<p>The pre-schedule wood core temperature must be determined by the facility (e.g. wood core measurements or the previous night's low temperature could be used as methods for determining core temperatures). At temperatures below 15°C the facility must have specifications in the quality manual to pre-heat the wood until a wood core temperature of at least one piece of lumber of the thickest nominal size (i.e. 60mm (2-1/4 inches), 85mm (3-1/4 inches), or 110mm (4-1/4 inches) reaches 15°C, before starting the official heat treatment process. Alternatively, the following temperature adjustment may be made</p> <p>For wood core temperatures below 15°C, add the temperature adjustment to the "Minimum Heat Treatment Run Time".</p> <p>Over 60mm (2¼") to 85 mm (3¼") add 10.0 minutes per 1°C (5.6 minutes per 1°F)</p> <p>Over 85mm (3¼") to 110 mm (4¼") add 15.3 minutes per 1°C (8.5 minutes per 1°F)</p>
<p>Pre-schedule wood core temperature verification and the pre-heating process is not required for pieces of wood less than or equal to 60 mm (2-1/4 inches).</p>

HEAT TREATMENT CHAMBER OPERATING CONDITIONS FOR OPTION B-1
Moisture reduction is not required to use this option.
Both wet-bulb and dry bulb temperatures are measured.
<p>At least three (3) dry bulb temperature sensors must be located on either side of the heat treatment chamber. Sensors must be spaced approximately at equal distance apart, perpendicular to the air flow. One sensor must be located at each end of the treatment chamber. These sensors should be placed closest to the end of the treatment chamber (approximately 5 m). The number of dry bulb sensors required will depend on the length of the individual kiln and the above sensor placement scale. For chamber equal to or less than 17 meters (56 feet) in length (in the direction perpendicular to air flow) the number of dry bulb sensors can be reduced to 2 dry bulb sensors with the above placement criteria. The dry bulb temperature must exceed the wet bulb temperature during the heat treatment to ensure the uniformity of the heat treatment chamber conditions. The temperatures must be recorded at a minimum of every 30 minutes.</p>
<p>At least one wet bulb temperature sensor, either measuring wet bulb temperature or providing data to determine the wet bulb temperature must be located near the mid third of the treatment chamber, on any one side. Temperatures must be recorded at a minimum of every 30 minutes.</p>
<p>Air flow should occur in each two opposite directions within the treatment chamber for half of the time specified at a temperature equal to or exceeding the wet bulb temperature run time (see tables for each option). This requirement may be modified where it can be technically proven by a recognized heat treatment evaluator and when other measures can compensate for deviation. This deviation will be referred to the CLSAB/CFIA Joint Technical Committee for review. Any modifications must be included in the quality manual and account for all the processes used to ensure that the phytosanitary standard is being met.</p>
<p>The pre-schedule wood core temperature must be determined by the facility (e.g. wood core measurements or the previous night's low temperature could be used as methods for determining core temperatures). At temperatures below 15°C the facility must have specifications in the quality manual to pre-heat the wood until a wood core temperature of at least one piece of lumber of the thickest nominal size (i.e. 60mm (2-1/4 inches), 85mm (3-1/4 inches), or 110mm (4-1/4 inches) reaches 15°C, before starting the official heat treatment process. Alternatively, the following temperature adjustment may be made:</p> <p style="padding-left: 40px;">For wood core temperatures below 15 ° C, add the temperature adjustment to the "Minimum Heat Treatment Run Time".</p> <p style="padding-left: 40px;">Over 60mm (2¼") to 85 mm (3¼") add 10.0 minutes per 1°C (5.6 minutes per 1°F)</p> <p style="padding-left: 40px;">Over 85mm (3¼") to 110 mm (4¼") add 15.3 minutes per 1°C (8.5 minutes per 1°F)</p> <p>Pre-schedule wood core temperature verification and the pre-heating process is not required for pieces of wood less than or equal to 60 mm (2-1/4 inches).</p>

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION B AND B-1			
Lumber Thickness	Minimum Heat Treatment Run Time ¹	Wet Bulb Temperature Run Time > 60°C (140F) ²	Minimum Final Wet-Bulb Temperature
Up to 60 mm (2 1/4 inches)	8 hrs. 29 mins.	4 hrs. 6 mins.	63°C (145°F)
Up to 85 mm (3 1/4 inches)	10 hrs. 40 mins.	6 hrs. 40 mins.	66°C (151°F)
Up to 110 mm (4 1/4 inches)	17 hrs. 31 mins.	13 hrs. 8 mins.	67°C (153°F)

Note ¹ :When treating wood greater than 60mm (2-1/4 inches) in thickness, the pre-schedule wood core temperature of at least one piece of wood must be at least 15°C before the treatment run time is measured (see table of "Heat Treatment Chamber Operating Conditions for Option B (or B-1)" for verification procedures for wood core temperature).

Note ² : "Wet Bulb Temperature Run Time" is the continuous portion of the heat treatment time where the wet bulb temperature measures > 60°C, measured in hours.

Option C: Heat Treatment with Moisture Reduction (Dry Bulb Only)

HEAT TREATMENT CHAMBER OPERATING CONDITIONS FOR OPTION C
This option can be used by a facility to heat treat the wood during the kiln drying process in order to reduce the moisture content below the fiber saturation point of the wood (approximately 30% MC).
Only dry bulb measurement is required.
The facility must employ the use of at least two dry bulb temperature sensors. The temperatures must be recorded at a minimum of every 30 minutes.
Air flow should occur in each two opposite directions within the treatment chamber for half of the time specified at a temperature equal to or exceeding the wet bulb temperature run time (see tables for each option). This requirement may be modified where it can be technically proven by a recognized heat treatment evaluator and when other measures can compensate for deviation. This deviation will be referred to the CLSAB/CFIA Joint Technical Committee for review. Any modifications must be included in the quality manual and account for all the processes used to ensure that the phytosanitary standard is being met.

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION C		
Lumber Thickness	Dry-Bulb Temperature Run Time > 52° C (>126° F) ¹	Minimum time at the End of the Treatment with the Dry-Bulb > 60° C (140° F) ²
Up to 28 mm (1 1/8 inches)	8 hrs.	4 hrs.
Up to 60 mm (2 1/4 inches)	18 hrs.	6 hrs.
Up to 60 mm (3 1/4 inches)	45 hrs.	15 hrs.
Up to 110 mm (4 1/4 inches)	72 hrs.	24 hrs.

Note ¹ :Dry bulb temperature run time is the continuous portion of the heat treatment time where the dry bulb temperature measures > 52°C, measured in hours.

Note ² : The "Minimum Time at the End of the Treatment with the Dry-Bulb > 60°C is included in the "Dry-Bulb Temperature Run Time", measured in hours.

Option D: Heat Treatment with Moisture Reduction (Dry Bulb Only)

HEAT TREATMENT CHAMBER OPERATING CONDITIONS FOR OPTION D
This option can be used by a facility to heat treat the wood during the kiln drying process in order to reduce the moisture content below the fiber saturation point of the wood (approximately 30% MC).
Only dry bulb measurement is required.
The facility must employ the use of at least two dry bulb temperature sensors. The temperatures must be recorded at a minimum of every 30 minutes.

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION D		
Lumber Thickness	Heat Treatment Run Time	Minimum time at the End of the Treatment with the Dry-Bulb > 71° C (160°F)¹
Up to 60 mm (2 1/4 inches)	12 hrs.	6 hrs.

Note¹: The “Minimum Time at the End of the Treatment with the Dry-Bulb > 71°C is included in the “Heat treatment Run Time”, measured in hours.

- 3) Specific Heat Treatment Chamber Operating Conditions for Generic Hardwood Schedules, Options E & F
These schedules apply to the following deciduous (hardwood) genera grown in Canada - maple (Acer spp.), alder (Alnus spp.), oak (Quercus spp.), birch (Betula spp.), ash (Fraxinus spp.), beech (Fagus spp.), aspen (Populus spp), poplar (Populus spp.) and basswood (Tilia spp.) .

Option E: Generic Hardwood Phytosanitary Heat Treatment Schedule without Moisture Reduction

Heat Treatment Chamber Operating Conditions for Option E								
Both wet-bulb and dry bulb temperatures are measured.								
Dry bulb temperature sensors must be located on at least one side of the heat treatment chamber and spaced not more than 7 meters (24 feet) apart, with one located no more than 2.5 m (8 feet) from each end of the treatment chamber. The number of dry bulb sensors required will depend on the length of the individual kiln and the above sensor placement scale. The temperatures must be recorded at a minimum of every 30 minutes.								
At least one wet bulb temperature sensor, either measuring wet bulb temperature or providing data to determine the wet bulb temperature must be located near the mid third of the treatment chamber, on any one side. Temperatures must be recorded at a minimum of every 30 minutes.								
Air flow should occur in each two opposite directions within the treatment chamber for half of the time specified at a temperature equal to or exceeding the wet bulb temperature run time (see tables for each option). This requirement may be modified where it can be technically proven by a recognized heat treatment evaluator and when other measures can compensate for deviation. This deviation will be referred to the CLSAB/CFIA Joint Technical Committee for review. Any modifications must be included in the quality manual and account for all the processes used to ensure that the phytosanitary standard is being met.								
<p>The pre-schedule wood core temperature must be determined by the facility (e.g. wood core measurements or the previous night's low temperature could be used as methods for determining core temperatures). At temperatures below 15°C the facility must have specifications in the quality manual to pre-heat the wood until a wood core temperature of at least one piece of lumber of the thickest nominal size (i.e. 60mm (2-1/4 inches), 85mm (3-1/4 inches), or 110mm (4-1/4 inches) reaches 15°C, before starting the official heat treatment process. Alternatively, the following temperature adjustments may be made:</p> <table border="0" data-bbox="243 1176 1421 1459"> <tr> <td data-bbox="243 1176 714 1239">For wood core temperatures below 15 ° C,</td> <td data-bbox="730 1176 1421 1239">add the temperature adjustment to the "Minimum Heat Treatment Run Time".</td> </tr> <tr> <td data-bbox="243 1260 714 1312">Over 60mm (2¼") to 85 mm (3¼").....</td> <td data-bbox="730 1260 1421 1312">add 10.0 minutes per 1°C (5.6 minutes per 1°F)</td> </tr> <tr> <td data-bbox="243 1323 714 1375">Over 85mm (3¼") to 110 mm (4¼").....</td> <td data-bbox="730 1323 1421 1375">add 15.3 minutes per 1°C (8.5 minutes per 1°F)</td> </tr> <tr> <td data-bbox="243 1386 714 1459">Greater than 110 mm (4 1/4 inches).....</td> <td data-bbox="730 1386 1421 1459">Adjustment not available. Direct core measurement is required.</td> </tr> </table> <p>Pre-schedule wood core temperature verification and the pre-heating process is not required for pieces of wood less than or equal to 60 mm (2-1/4 inches).</p>	For wood core temperatures below 15 ° C,	add the temperature adjustment to the "Minimum Heat Treatment Run Time".	Over 60mm (2¼") to 85 mm (3¼").....	add 10.0 minutes per 1°C (5.6 minutes per 1°F)	Over 85mm (3¼") to 110 mm (4¼").....	add 15.3 minutes per 1°C (8.5 minutes per 1°F)	Greater than 110 mm (4 1/4 inches).....	Adjustment not available. Direct core measurement is required.
For wood core temperatures below 15 ° C,	add the temperature adjustment to the "Minimum Heat Treatment Run Time".							
Over 60mm (2¼") to 85 mm (3¼").....	add 10.0 minutes per 1°C (5.6 minutes per 1°F)							
Over 85mm (3¼") to 110 mm (4¼").....	add 15.3 minutes per 1°C (8.5 minutes per 1°F)							
Greater than 110 mm (4 1/4 inches).....	Adjustment not available. Direct core measurement is required.							

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION E			
Lumber Thickness	Minimum Heat Treatment Run Time ¹	Wet Bulb Temperature Run Time > 60°C (> 140°F) ²	Minimum Final Wet-Bulb Temperature
Up to 60 mm (2 1/4 inches)	8 hrs, 2 mins.	2 hrs, 46 mins.	63°C (145°F)
Up to 85 mm (3 1/4 inches)	9 hrs, 10 mins.	4 hrs, 30 mins.	66°C (151°F)
Up to 110 mm (4 1/4 inches)	13 hrs, 40 mins.	8 hrs, 52 mins.	67°C (153°F)

Note ¹: When treating wood greater than 60mm (2-1/4 inches) in thickness, the pre-schedule wood core temperature of at least one piece of wood must be at least 15°C before the treatment run time is measured.

Note ²: "Wet Bulb Temperature Run Time" is the continuous portion of the heat treatment time where the wet bulb temperature measures > 60°C, measured in hours.

Generic Phytosanitary Heat Treatment Schedules for Hardwood Timbers Thicker Than 5"

(Options E-1 to E-6)

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION E-1			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time ≥ 70°C/(158°F) ¹	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	11 hrs, 26 minutes	6 hrs, 56 minutes	70°C (158°F)
Up to 152 mm (6 inches)	13 hrs, 38 minutes	9 hrs, 8 minutes	70°C (158°F)
Up to 178 mm (7 inches)	16 hrs, 17 minutes	11 hrs, 47 minutes	70°C (158°F)
Up to 203 mm (8 inches)	19 hrs, 30 minutes	15 hrs	70°C (158°F)
Up to 228 mm (9 inches)	23 hrs, 17 minutes	18 hrs, 47 minutes	70°C (158°F)
Up to 254 mm (10 inches)	27 hrs, 46 minutes	23 hrs, 16 minutes	70°C (158°F)
Up to 279 mm (11 inches)	32 hrs, 59 minutes	28 hrs, 29 minutes	70°C (158°F)
Up to 305 mm (12 inches)	39 hrs, 1 minute	34 hrs, 31 minutes	70°C (158°F)

Note ¹:: During the "Wet bulb temperature run time", the Dry Bulb temperature must equal or exceed 71°C (160°F).

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION E-2			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time $\geq 69^{\circ}\text{C}/(156^{\circ}\text{F})^1$	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	13 hrs, 30 minutes	9 hrs	69°C (156°F)
Up to 152 mm (6 inches)	16 hrs, 20 minutes	11 hrs, 50 minutes	69°C (156°F)
Up to 178 mm (7 inches)	19 hrs, 47 minutes	15 hrs, 17 minutes	69°C (156°F)
Up to 203 mm (8 inches)	23 hrs, 54 minutes	19 hrs, 24 minutes	69°C (156°F)
Up to 228 mm (9 inches)	28 hrs, 47 minutes	24 hrs, 17 minutes	69°C (156°F)
Up to 254 mm (10 inches)	34 hrs, 31 minutes	30 hrs, 1 minute	69°C (156°F)
Up to 279 mm (11 inches)	41 hrs, 12 minutes	36 hrs, 42 minutes	69°C (156°F)
Up to 305 mm (12 inches)	48 hrs, 55 minutes	44 hrs, 25 minutes	69°C (156°F)

Note¹ : During the “Wet bulb temperature run time”, the Dry Bulb temperature must equal or exceed 71°C (160°F).

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION E-3			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time $\geq 68^{\circ}\text{C}/(154^{\circ}\text{F})^1$	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	15 hrs, 2 minutes	10 hrs, 32 minutes	68°C (154°F)
Up to 152 mm (6 inches)	18hrs, 20 minutes	13 hrs, 50 minutes	68°C (154°F)
Up to 178 mm (7 inches)	22 hrs, 22 minutes	17 hrs, 52 minutes	68°C (154°F)
Up to 203 mm (8 inches)	27 hrs, 9 minutes	22 hrs, 39 minutes	68°C (154°F)
Up to 228 mm (9 inches)	32 hrs, 51 minutes	28 hrs, 21 minutes	68°C (154°F)
Up to 254 mm (10 inches)	39 hrs, 31 minutes	35 hrs, 1 minute	68°C (154°F)
Up to 279 mm (11 inches)	47 hrs, 16 minutes	42 hrs, 46 minutes	68°C (154°F)
Up to 305 mm (12 inches)	56 hrs, 14 minutes	51 hrs, 44 minutes	68°C (154 °F)

Note¹: During the “Wet bulb temperature run time”, the Dry Bulb temperature must equal or exceed 71°C (160 °F).

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION E-4			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time $\geq 67^{\circ}\text{C}/(152^{\circ}\text{F})^1$	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	16 hrs, 17 minutes	11 hrs, 47 minutes	67°C (152°F)
Up to 152 mm (6 inches)	20 hrs	15 hrs, 30 minutes	67°C (152°F)
Up to 178 mm (7 inches)	24 hrs, 29 minutes	19 hrs, 59 minutes	67°C (152°F)
Up to 203 mm (8 inches)	29 hrs, 50 minutes	25 hrs, 20 minutes	67°C (152°F)
Up to 228 mm (9 inches)	36 hrs, 11 minutes	31 hrs, 41 minutes	67°C (152°F)
Up to 254 mm (10 inches)	43 hrs, 38 minutes	39 hrs, 8 minutes	67°C (152°F)
Up to 279 mm (11 inches)	52 hrs, 16 minutes	47 hrs, 46 minutes	67°C (152°F)
Up to 305 mm (12 inches)	62 hrs, 15 minutes	57 hrs, 45 minutes	67°C (152°F)

Note¹ : During the “Wet bulb temperature run time”, the Dry Bulb temperature must equal or exceed 71°C (160°F).

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION E-5			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time $\geq 66^{\circ}\text{C}/(150^{\circ}\text{F})^1$	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	17 hrs, 24 minutes	12 hrs, 54 minutes	66°C (150°F)
Up to 152 mm (6 inches)	21 hrs, 25 minutes	16 hrs, 55 minutes	66°C (150°F)
Up to 178 mm (7 inches)	26 hrs, 18 minutes	21 hrs, 48 minutes	66°C (150°F)
Up to 203 mm (8 inches)	32 hrs, 9 minutes	27 hrs, 39 minutes	66°C (150°F)
Up to 228 mm (9 inches)	39 hrs, 5 minutes	34 hrs, 35 minutes	66°C (150°F)
Up to 254 mm (10 inches)	47 hrs, 11 minutes	42 hrs, 41 minutes	66°C (150°F)
Up to 279 mm (11 inches)	56 hrs, 35 minutes	52 hrs, 5 minutes	66°C (150°F)
Up to 305 mm (12 inches)	67 hrs, 29 minutes	62 hrs, 59 minutes	66°C (150°F)

Note¹ : During the “Wet bulb temperature run time”, the Dry Bulb temperature must equal or exceed 71°C (160°F).

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION E-6			
Lumber Thickness	Minimum Heat Treatment Run Time	Wet Bulb Temperature Run Time $\geq 64^{\circ}\text{C}/(148^{\circ}\text{F})^1$	Minimum Final Wet-Bulb Temperature
Up to 127 mm (5 inches)	18 hrs, 22 minutes	13 hrs, 52 minutes	64°C (148°F)
Up to 152 mm (6 inches)	22 hrs, 42 minutes	18 hrs, 12 minutes	64°C (148°F)
Up to 178 mm (7 inches)	27 hrs, 57 minutes	23 hrs, 27 minutes	64°C (148°F)
Up to 203 mm (8 inches)	34 hrs, 13 minutes	29 hrs, 43 minute	64°C (148°F)
Up to 228 mm (9 inches)	41 hrs, 39 minutes	37 hrs, 9 minutes	64°C (148°F)
Up to 254 mm (10 inches)	50 hrs, 21 minutes	45 hrs, 51 minutes	64°C (148°F)
Up to 279 mm (11 inches)	60 hrs, 27 minutes	55 hrs, 57 minutes	64°C (148°F)
Up to 305 mm (12 inches)	72 hrs, 8 minutes	67 hrs, 38 minutes	64°C (148°F)

Note¹: During the “Wet bulb temperature run time”, the Dry Bulb temperature must equal or exceed 71°C (160°F).

Option F: Generic Hardwood Phytosanitary Heat Treatment Schedule with Moisture Reduction

<p>SPECIFIC HEAT TREATMENT CHAMBER OPERATING CONDITIONS FOR OPTION F</p>						
<p>This option can be used by a facility to heat treat the wood during the kiln drying process in order to reduce the moisture content below the fiber saturation point of the wood (approximately 30% MC).</p>						
<p>Both wet-bulb and dry bulb temperatures are measured.</p>						
<p>The heat treatment chamber must be equipped with at least one dry-bulb temperature sensor. If the air entering/ air exiting plenum is divided into three equal length segments, the temperature sensor(s) must be located as follows: At least one dry-bulb temperature sensor will be located within the mid-third segment of the kiln (on either side). If this condition is met, location of other sensors is not restricted. In lieu of a dry-bulb temperature sensor within the mid-third of the kiln, the kiln can be operated with two (or more) dry-bulb temperature sensors with at least one sensor located in each of the segments located at opposite ends of the kiln (on either side). The dry bulb(s) temperature must exceed the wet bulb temperature during the heat treatment to ensure the uniformity of the heat treatment chamber conditions. Temperatures must be recorded at a minimum of every 30 minutes</p>						
<p>At least one dry bulb temperature sensor must be located near the mid third of the heat treatment chamber, on any one side. The temperatures must be recorded at a minimum of every 30 minutes.</p>						
<p>At least one wet bulb temperature sensor, either measuring wet bulb temperature or providing data to determine the wet bulb temperature must be located near the mid third of the treatment chamber, on any one side. Temperatures must be recorded at a minimum of every 30 minutes.</p>						
<p>Air flow should occur in each two opposite directions within the treatment chamber for half of the time specified at a temperature equal to or exceeding the wet bulb temperature run time (see tables for each option). This requirement may be modified where it can be technically proven by a recognized heat treatment evaluator and when other measures can compensate for deviation. This deviation will be referred to the CLSAB/CFIA Joint Technical Committee for review. Any modifications must be included in the quality manual and account for all the processes used to ensure that the phytosanitary standard is being met.</p>						
<p>The pre-schedule wood core temperature must be determined by the facility (e.g. wood core measurements or the previous night's low temperature could be used as methods for determining core temperatures). At temperatures below 15 °C the facility must have specifications in the quality manual to pre-heat the wood until a wood core temperature of at least one piece of lumber of the thickest nominal size (i.e. 60mm (2-1/4 inches), 85mm (3-1/4 inches), or 110mm (4-1/4 inches) reaches 15°C, before starting the official heat treatment process. Alternatively, the following temperature adjustment may be made:</p> <table border="0" data-bbox="243 1512 1421 1638"> <tr> <td style="padding-left: 40px;">For wood core temperatures below 15 ° C,</td> <td>add the temperature adjustment to the “Minimum Heat Treatment Run Time”.</td> </tr> <tr> <td style="padding-left: 40px;">Over 60mm(2¼”) to 85mm (3¼”).....</td> <td>add 12.7 minutes per 1°C (7.1 minutes per 1°F)</td> </tr> <tr> <td style="padding-left: 40px;">Over 85mm(3¼”) to 110 mm (4¼”).....</td> <td>add 19.3 minutes per 1°C (10.7 minutes per 1°F)</td> </tr> </table> <p>Pre-schedule wood core temperature verification and the pre-heating process is not required for pieces of wood less than or equal to 60 mm (2-1/4 inches).</p>	For wood core temperatures below 15 ° C,	add the temperature adjustment to the “Minimum Heat Treatment Run Time”.	Over 60mm(2¼”) to 85mm (3¼”).....	add 12.7 minutes per 1°C (7.1 minutes per 1°F)	Over 85mm(3¼”) to 110 mm (4¼”).....	add 19.3 minutes per 1°C (10.7 minutes per 1°F)
For wood core temperatures below 15 ° C,	add the temperature adjustment to the “Minimum Heat Treatment Run Time”.					
Over 60mm(2¼”) to 85mm (3¼”).....	add 12.7 minutes per 1°C (7.1 minutes per 1°F)					
Over 85mm(3¼”) to 110 mm (4¼”).....	add 19.3 minutes per 1°C (10.7 minutes per 1°F)					

GENERIC PHYTOSANITARY HEAT TREATMENT SCHEDULE FOR OPTION F			
Lumber Thickness	Minimum Heat Treatment Run Time ¹	Wet Bulb Temperature Run Time > 60°C (140°F) ²	Minimum Final Wet-Bulb Temperature
Up to 60 mm (2 1/4 inches)	10 hrs, 36 mins.	5 hrs, 32 mins.	63°C (145°F)
Up to 85 mm (3 1/4 inches)	13 hrs, 20 mins.	9 hrs, 0 mins.	66°C (151°F)
Up to 110 mm (4 1/4 inches)	21 hrs, 54 mins.	17 hrs, 44 mins.	67°C (153°F)

Note¹ : When treating wood greater than 60mm (2-1/4 inches) in thickness, the pre-schedule wood core temperature of at least one piece of wood must be at least 15° C before the treatment run time is measured.

Note² : "Wet Bulb Temperature Run Time" is the continuous portion of the heat treatment time where the wet bulb temperature measures > 60°C, measured in hours

d) VERIFICATION OF COMPLIANCE**1) LABELING**

All softwood lumber which has been treated to meet the General Conditions of Section (c)(1) and the specific conditions one of the options in Section (c)(2) or (c)(3) may be identified as follows:

- i) All pieces of lumber which have achieved both the required moisture content and undergone the appropriate heat treatment schedule may be affixed with a Grading Agency stamp approved by CLSAB bearing the letters KD-HT or HT. The KD-HT or HT stamp shall be positioned on each piece of lumber in accordance with the current CLSAB Regulations.
- ii) Lumber which has been heat treated without moisture content reduction but has undergone the required heat treatment schedule may be labeled as HT. The HT stamp shall designate the Agency, and the Mill Number and shall be positioned on each piece of lumber in accordance with current CLSAB Regulations.
- iii) KILN WETS (Pieces of lumber that do not achieve the desired moisture content in the drying process). Randomly occurring pieces of lumber which have been processed in the same kiln drying charge, but do not achieve the desired moisture content of 19% or less may be marked with an HT stamp, which will designate that the lumber has undergone "Heat Treatment" in accordance with the NLGA Grading Rules Definition. The HT stamp shall designate the Agency and the Mill Number and shall be positioned on each piece of lumber in accordance with current CLSAB Regulations.

2) CERTIFICATE ISSUANCE

All softwood lumber which has been treated to meet the General Conditions of Section (c)(1) and the specific conditions of one of the options in Section (c)(2) or (c)(3) may be identified by:

- i) an industry issued certificate stating that material has met the requirements of the HT designation or,
- ii) a phytosanitary certificate issued by CFIA

In either case, the facility producing or certifying the material shall be under the jurisdiction of the CLSAB and its accredited agencies.

e) RECORDS & REPORTING

- 1) All records shall be in compliance with the general CLSAB "Regulations".
- 2) An audit checklist, as shown in Schedule "D" shall be completed by the agency.
- 3) Agencies shall make their records available to CLSAB in compliance with CLSAB "Regulations" and as required by the Board.

SCHEDULE "D": CLSAB "KD-HT" CHECK LIST

Agency / L'agence	Company / Entreprise Mill #/ Numéro d'usine	Location / Location Date / Date	Y	N	N/A
<p>1. PHYTOSANITARY QUALITY MANUAL / Manuel de qualité phytosanitaire</p> <p>a) Is a current CLSAB approved Phytosanitary Quality Manual (PQM) on file and available. / Un manuel de qualité phytosanitaire (MQS), à jour et approuvé par le CLSAB, est-il sur place et disponible?</p> <p>b) Have there been any changes since last visit? / Y-a-t-il apporté des modifications depuis la dernière visite?</p> <p>ii) If yes, have the changes made by the facility been submitted to the grading agency responsible for overseeing the program? / Si oui, les modifications effectuées par l'établissement ont-elles été soumises à l'agence responsable pour la vérification de ce programme?</p> <p>COMMENTS/ COMMENTAIRES: -----</p>					
<p>2. KILN SCHEDULES / Programmes de séchage</p> <p>a) Do their records conform to their PQM/ Les documents de l'établissement sont-ils conformes avec leur MQS/ Les documents de l'établissement sont-ils conformes avec leur MQS?</p> <p>b) Is the facility using a generic schedule as per CLSAB Schedule C/ L'établissement a-t-il utilisé un programme générique selon la Schedule C du CLSAB?</p> <p>i) If yes, is the option utilized indicated? / Si oui, est l'option utilisée indiquée?</p> <p>ii) If no, is the facility using a schedule verified by a third party/ Si non, l'établissement utilise-t-il un programme vérifié par une tierce partie?</p> <p>iii) If no, is the facility using direct measurement of wood core temperatures/ Si non, l'établissement mesure-t-il de façon directe les températures au cœur du bois?</p> <p>c) If Option A, B, E or F are used, did the WB reach 140° F (60°C) for the minimum required time/ Si les options A, B, E ou F sont utilisées, le thermomètre humide (TH) a-t-il atteint 60C (140F) pour la durée requise?</p> <p>d) Have the pre-schedule wood core temperature requirements (Pre-heat or run time adjustment) (if applicable)/ Les exigences minimales pour la température interne du bois avant le traitement sont-elles respectées? (préchauffage ou prolongation du programme de traitement, s'il y a lieu)</p> <p>e) If Option Cor D are used, did the DB reach the applicable time/ température/ Si les options C ou D sont utilisées, le TS a-t-il atteint la température nécessaire et la durée de temps appropriée?</p> <p>COMMENTS/ COMMENTAIRES: -----</p>					
<p>3. OPERATING CONDITIONS / Conditions d'opération</p> <p>a) Are the operating conditions in compliance with their PQM/ Les conditions d'opération sont-elles conformes avec le MQS de l'établissement?</p> <p>i) Are packages well prepared for treatment (sticker size, placement etc.) / Les paquets sont-ils bien préparés pour le traitement (dimension des baguettes, emplacement, etc.)?</p> <p>b) Have any treatment records been found to be non-compliant/ Est-ce qu'il y a des documents de traitement en non-conformité?</p> <p>i) If yes, has appropriate action been taken (comment)/ Si oui, est-ce que les mesures appropriées ont été prises? (commentaire)?</p> <p>COMMENTS/ COMMENTAIRES: -----</p>					
<p>4. INVENTORY CONTROL / Contrôle des inventaires</p> <p>a) Is KD-HT or HT material segregated from non-KD-HT or HT material/ Le matériel KD-HT ou HT est-il bien séparé du matériel qui n'a pas subi de traitement?</p> <p>b) Is the material traceable to kiln charges(s) or (Bill of Lading)/ Le matériel est-il retraçable aux chargements(s) de/ des séchoir(s) de?</p> <p>c) Has the facility issued any domestic HT Certificates since last visit/ L'établissement a-t-il émis des certificats HT pour le territoire canadien depuis la dernière visite?</p> <p>COMMENTS/ COMMENTAIRES: -----</p>					
<p>5. MATERIAL PACKAGED FOR EXPORT/ Matériel emballé pour l'exportation</p> <p>i) Is there any off-shore material available for inspection/ Y-a-t-il du matériel destiné pour l'outre-mer de disponible??</p> <p>a) CERTIFICATES/ Certificats</p> <p>i) Has the facility issued certificates since last visit/ L'établissement a-t-il émis des certificats depuis la dernière visite?</p> <p>If yes, are certificates completed correctly, including, / Si oui, ont-ils été complétés correctement, incluant</p> <p>Address / l'adress,</p> <p>Lot Numbers / les numéros des lots</p> <p>Certificate # / les numéros de certificat et</p> <p>Product Description / description du produit</p> <p>Signature / une signature</p> <p>ii) Are the certificates signed by approved personnel listed on the facility's Heat Treatment Certificate Signing Authority/ Si oui, ont-ils été complétés</p> <p>correctement, incluant: la liste du personnel autorisé à signer un certificat de traitement pour cet établissement?</p> <p>iii) Are issued certificates traceable to a certified treatment facility's KD-HT or HT sont-ils retraçables aux chargements de séchoir appropriés??</p> <p>iv) Are the certificates traceable to a certified treatment facility's KD-HT or HT mark/ Les certificats sont-ils retraçables à la marque certifiée KD-HT ou HT de l'établissement?</p> <p>COMMENTS/ COMMENTAIRES: -----</p>					
<p>b) Package Labeling/ Etiquetage des paquets</p> <p>i) Does the label identify/ Est-ce que l'étiquette identifie:</p> <p>CA-XXXXX/ le numéro CA-XXXXX or Agency Mill number/ l'agence or Agency Mill number/ KD-HT ou HT</p> <p>c) Attached Damage/ Bois de calage attaché</p> <p>i) Is the attached damage HT compliant/ Le bois de calage est-il en conformité en regard au traitement HT?</p> <p>ii) Is it legibly marked/ La marque est-elle lisible</p> <p>COMMENTS/ COMMENTAIRES: -----</p>					
<p>6. FURTHER PROCESSING OF HT WOOD/ Transformation supplémentaire de bois HT:</p> <p>a) Does this facility have kilns/ L'établissement a-t-il des séchoirs?</p> <p>i) If no, is the HT material traceable to a specific HT certified facility/ Si non, le matériel HT est-il retraçable à un établissement spécifique étant certifié pour le traitement HT?</p> <p>COMMENTS/ COMMENTAIRES: -----</p>					
<p>7. CONTROL OF ISPM NO. 15 MARK/ Contrôle de la marque ISPM No 15</p> <p>a) Is the facility registered to use the ISPM mark? / L'établissement est-il enregistré pour l'utilisation de la marque ISPM No 15</p> <p>b) Is the facility using the ISPM mark/ Est-ce que l'établissement utilise la marque ISPM No 15?</p> <p>i) If yes, is the mark legible/ Si oui, la marque est-elle lisible?</p> <p>COMMENTS/ COMMENTAIRES: -----</p>					