| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| [1] | G | Substantive | In general, EPPO supports the approval of dielectric heating as a treatment for WPM. However, EPPO has some specific concerns which may need further consideration. Therefore, EPPO requests the IPPC Technical Panels to review the existing scientific evidence in order to verify whether all aspects important for the effective application of the dielectric heat treatment have been sufficiently addressed in the current draft revision of Annex to ISPM 28.<br>Some specific concerns relate to the final distribution of temperature throughout the profile of the wood as a result of the application of the dielectric heat treatment, e.g. whether the surface of wood will always be the coldest, which relates further to the placement of temperature sensors during the treatment (e.g. should they be placed on two opposite sides of the wood or inside the piece of wood).<br>Specific attention may also be needed to the application of the dielectric heating to frozen wood or to dry wood that has become wet at the surface.<br>Another aspect that may require further consideration is the possible need to specify requirements for the uniformity of the electromagnetic field during the treatment and methods or standards relating to its measuring and verification. The ability of microwaves to penetrate stacks of wood may also need to be further considered to clarify whether there is a need for requirements for spacing of wood during the treatment. | The EPPO Panel on CPM Affairs has received a scientific paper (Henin et al., under submission) which presents the results of the application of dielectric heating to frozen wood; the results show that in some cases the surface of wood reached the required temperature while the temperature of the core was lower than required. | EPPO,Norway ,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |
| [2] | G | Substantive | The proposed treatment should be significantly revised. | 1. Dielectric heating may make for a viable phytosanitary treatment of timber. However, there are concerns with the proposed treatment particularly in relation to the feasibility of using this process of treatment delivery to achieve the desired phytosanitary outcome consistently. Australia is of the view that the application of heat treatments through dielectric processes in full scale commercial operations is still developing, and while the processes are effective in laboratory situations its translation to commercial operations are limited. Of specific technical concern to Australia is that the feasibility for delivery of the desired outcomes is poor as with microwave heating the distribution of heat in the timber is uneven in a manner that is not easily predictible which makes monitoring difficult and phytosanitary outcomes uncertain. Real time monitoring of internal | Australia |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | wood temperature during treatment that accounts for temperature variability doesn't seem practical outside of laboratory scale treatments. ISPM 28 requires that the data supporting the treatment should be verifiable, reproducible and that "3. Requirements for Phytosanitary Treatments For the purpose of this standard, phytosanitary treatments should fulfil the following requirements: - be effective in killing, inactivating or removing pests, or rendering pests infertile or for devitalization associated with a regulated article. The level of efficacy of the treatment should be stated (quantified or expressed statistically). Where experimental data is unavailable or insufficient, other evidence that supports the efficacy (i.e. historical and/or practical information/experience) should be provided. - be well documented to show that the efficacy data has been generated using appropriate scientific procedures, including where relevant an appropriate experimental design. The data supporting the treatment should be verifiable, reproducible, and based on statistical methods and/or on established and accepted international practice; preferably the research should have been published in a peer-reviewed journal. - be feasible and applicable for use primarily in international trade or for other purposes (e.g. to protect endangered areas domestically, or for research)." 2. For PWN the efficacay has been proved and supported by the references. However for ALHB the references do not support the claim for efficacy nor the extrapolation to other timber pests. A number of references are provided that may assist the TPPT in its review of this technology and application. As a consequence of these technical concerns, Australia | |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | requests that the proposed treatment is significantly revised. While Australia appreciates that the annexes to ISPM 28 do not contain significant detail on the operational processes for delivering the treatment, comments by Australia on the existing text are made with the intent of providing the TPPT with information that may assist it in addressing Australia's concerns. In summary, Australia's major focus in requesting revision revolves around the introduction of a new technology for delivering phytosanitary treatment that must be sufficiently proven in commercial operation to provide confidence that it is both feasible and will deliver the treatment consistently to achieve the required level of phytosanitary security required. | |
| [3] | G | Substantive | | The amount of information evaluated by the TPPT is not reflected in the information presented following the format adopted for phytosanitary treatments. Altough references are cited in the document, frequently it is difficult to get them or they are unavailable, not having enough information for the application of the treatment in practice. This is specially important for treatments like this which is not a conventional treatment, where guidance on the application may be needed for NPPos. The draft should explain with more detail the operational procedure of the treatment. This comment should be considered for all the treatments including the treatments already adopted. | Costa Rica ,Mexico ,Nicaragua |
| [4] | G | Substantive | | The amount of information evaluated by the TPPT is not reflected in the information presented following the format adopted for phytosanitary treatments. Although references are cited in the document, frequently it is difficult to get | Uruguay |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | them or they are unavailable, not having enough information for the application of the treatment in practice. This is especially important for treatments like this which is not a conventional treatment, where guidance on the application may be needed for NPPOs. This comment should be considered for all treatments, including treatments already adopted | |
| [5] | G | Substantive | | The amount of information evaluated by the TPPT is not reflected in the information presented following the format adopted for phytosanitary treatments. Although references are cited in the document, frequently it is difficult to get them or they are unavailable, not having enough information for the application of the treatment in practice. This is especially important for treatments like this which is not a conventional treatment, where guidance on the application may be needed for NPPOs. | COSAVE,Paraguay ,Chile,Brazil |
| [6] | G | Substantive | | GENERAL COMMENTS • It would be more appropriate to put this Annex into ISPM 15. Treatment details should be removed and placed in ISPM 15 with a reference to ISPM 15 added in ISPM 28. Both the addition to ISPM 15 and the Draft Annex to ISPM 28 have very similar information and text when discussing treatments. It is repetitive to have this information in more than one place. If the ISPM 28 Annex is supposed to be a treatment schedule, then it should be treated like other treatment schedules. Having the same information in different places may be confusing to countries looking for certain treatments as ISPM 28 only has some treatments described while ISPM 15 has them all. If this treatment cannot be moved to ISPM 15, then each Annex should reference the other document (i.e. “Additional treatments can | United States of America |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | be found in ISPM 15/ISPM 28"). • This Draft Annex should explain how the microwave treatment is set up, where the probes are placed, what research was used, what type of wood is being used, and how this treatment is going to be performed. This is important information that adds to the understanding and credibility of the Draft Annex. • The paper should state what type of microwave is being used. Microwaves can differ, so the type used should be specified. | |
| [7] | G | Substantive | EU and its 27 Member States (hereinafter referred to as the 'EU') support the adoption of dielectric heating as a treatment for WPM. However, EU has some specific concerns which may need further consideration. Therefore, we request that the existing scientific evidence is reviewed in order to verify whether all aspects important for the effective application of the dielectric heat treatment have been sufficiently addressed in the current draft revision of Annex to ISPM<br>28 and that the draft is modofied accordingly, if deemed necessary.<br>Some specific concerns relate to the final distribution of temperature throughout the profile of the wood as a result of the application of the dielectric heat treatment, e.g. whether the surface of wood will always be the coldest, which relates further to the placement of temperature sensors during the treatment (e.g. should they be placed on two opposite sides of the wood or inside the piece of wood).<br>Specific attention may also be needed to the application of the dielectric heating to frozen wood or to dry wood that has become wet at the surface.<br>Another aspect that may require further consideration is the possible need to specify requirements for the uniformity of the electromagnetic field during the treatment and methods or standards relating to its measuring and verification. The ability of microwaves to penetrate stacks of wood may also need to be further considered to clarify whether there is a need for requirements for spacing of wood during the treatment. | The EU has received a scientific paper [Henin, J.M. et al.: Implementing a Microwave Irradiation Treatment of Wood Packaging Material in ISPM15: Practical Issues of Concern (under submission to the Forest Products Journal)], which presents the results of the application of dielectric heating to frozen wood; the results show that in some cases the surface of wood reached the required temperature while the temperature of the core was lower than required. | European Union |
| [8] | G | Substantive | | The amount of information evaluated by the TPPT is not reflected in the information presented following the format adopted for phytosanitary treatments. Although references are cited in the document, frequently it is difficult to get them or they are unavailable, not having enough information for the application of | Argentina |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | the treatment in practice. This is especially important for treatments like this which is not a conventional treatment, where guidance on the application may be needed for NPPOs. | |
| [9] | G | Substantive | The amount of information evaluated by the TPPT is not reflected in the information presented following the format adopted for phytosanitary treatments. Although references are cited in the document, frequently it is difficult to get them or they are unavailable, not having enough information for the application of the treatment in practice. This is especially important for treatments like this which is not a conventional treatment, where guidance on the application may be needed for NPPOs.<br>The draft should explain with more detail the operational procedure of the treatment. This comment should be considered for all treatments including treatments already adopted | | El Salvador |
| [10] | G | Substantive | The amount of information evaluated by the TPPT is not reflected in the information presented following the format adopted for phytosanitary treatments. Although references are cited in the document, frequently it is difficult to get them or they are unavailable, not having enough information for the application of the treatment in practice. This is especially important for treatments like this which is not a conventional treatment, where guidance on the application may be needed for NPPOs.<br>The draft should explain with more detail the operational procedure of the treatment. This comment should be considered for all treatments including treatments already adopted | | OIRSA |
| [11] | G | Technical | The standard are difficulty to implement. | 1) hard to test the temperature on surface when the treated consignment are moving. 2) hard to make sure where is the coldest part, which need to reach target temperature. 3) facilities are expensive. 4)during treatment, some part of consignment are very high temperature(almost burning), some part still very cool. | China |
| [12] | 3 | Technical | **7. Draft ANNEX: Heat treatment of wood packaging material using dielectric heating, ISPM 28:2007** | For consistency, 'heating' instead of 'heat'. Also physically speaking, it is really the heating process that is dielectric, not the heat itself. | EPPO,Norway ,Russian Federation ,European Union ,Ukraine ,Morocco ,Uzbekistan |
| [13] | 3 | Technical | **7. Draft ANNEX: Heat treatment of wood packaging material** | Heating is achieved using dielectric | Costa Rica ,Uruguay |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | **using dielectric radiation ~~heat~~, ISPM 28:2007** | radiation. To be consistent with comments on ISPM 15:2009 Draft revision of Annex 1. | ,Mexico ,Nicaragua ,El Salvador |
| [14] | 3 | Technical | **7. Draft ANNEX: Heat treatment of wood packaging material using dielectric ~~heat~~radiation , ISPM 28:2007** | Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of Annex 1 | COSAVE,Paraguay ,Chile,Brazil |
| [15] | 3 | Technical | **7. Draft ANNEX: Heat treatment of wood packaging material using dielectric radiation ~~heat~~, ISPM 28:2007** | Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of Annex 1 | Argentina |
| [16] | 3 | Technical | **7. Draft ANNEX: Heat treatment of wood packaging material using dielectric radiation~~heat,~~ ISPM 28:2007** | Heating is achieved using dielectric radiation. To be consistent with comments on ISPM 15:2009 draft revision of Annex 1 | OIRSA |
| [17] | 7 | Editorial | This treatment applies to the heat treatment of wood packaging material using dielectric heat to reduce the risk of introduction and spread of those pests associated with wood packaging in international trade including Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)~~1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15.~~ | ISPM 15 is to reduce the pests associated with wood packaging in international trade. The criteria for treatment is not complete yet. | New Zealand |
| [18] | 7 | Editorial | This ~~treatment applies to~~ annex describes the heat treatment of wood packaging material using dielectric heating to reduce the risk of introduction and spread of ~~Asian longhorned beetle (~~*Anoplophora glabripennis*) ~~(ALB)~~, ~~pinewood nematode (~~*Bursaphelenchus xylophilus*~~) (PWN)1~~ and ~~those~~ other pests required to meet the criteria for treatment as prescribed in ISPM 15 [FOOTNOTE 1]. | - Better English and 'Heating' instead of 'heat' for consistency. As for the names of pests, ISPMs should use scientific names only instead of names used in one or some countries only. - The footnote after (PWN) should be moved to the end of the sentence - Insertion of 'other': to clarify that also ALB and PWN are pests that are required to meet criteria for treatment in ISPM 15 | EPPO,Norway ,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |
| [19] | 7 | Editorial | This treatment applies to ~~the heat treatment of~~ wood packaging material using dielectric heat to prevent ~~reduce~~ the ~~risk of~~ introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | Deleted beacuse it is redundant. "Reduce" was replaced with "Prevent" to clarify. | Costa Rica ,Mexico ,Nicaragua ,El Salvador |
| [20] | 7 | Editorial | This treatment applies to ~~the heat treatment of~~ wood packaging material using dielectric heat to ~~reduce~~ prevent the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | 1) Text deleted because it is redundant. 2) “reduce” was replaced by “prevent” to clarify | Uruguay |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| [21] | 7 | Editorial | This treatment applies to ~~the heat treatment of~~ wood packaging material using dielectric heat to ~~reduce~~ prevent the ~~risk of~~ introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | Text "the heat treatment of " was deleted because is redundant. “reduce” was replaced by “prevent” to clarify | COSAVE,Paraguay ,Argentina ,Chile,Brazil |
| [22] | 7 | Editorial | This ~~treatment applies to~~ annex describes the heat treatment of wood packaging material using dielectric heating to reduce the risk of introduction and spread of ~~Asian longhorned beetle (~~*Anoplophora glabripennis*~~) (ALB)~~, ~~pinewood nematode (~~*Bursaphelenchus xylophilus*~~) (PWN)1~~ and ~~those~~ other pests required to meet the criteria for treatment as prescribed in ISPM 15 [FOOTNOTE 1]. | - Better English - 'Heating' instead of 'heat' for consistency. - As for the names of pests, ISPMs should use scientific names only instead of names used in one or some countries only. - The footnote after (PWN) should be moved to the end of the sentence - Insertion of 'other': to clarify that also ALB and PWN are pests that are required to meet criteria for treatment in ISPM 15 | European Union |
| [23] | 7 | Editorial | This treatment applies to ~~the heat treatment of~~ wood packaging material using dielectric heat to ~~reduce~~ prevent the ~~risk of~~ introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | 1) Deleted because it is redundant. 2) “reduce” was replaced with “prevent” to clarify | OIRSA |
| [24] | 7 | Substantive | This treatment applies to the heat treatment of wood packaging material using dielectric heat in the following radio frequency and microwave frequency bands (list of bands) to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | Specify the frequencies this standard applies to. The published data referred to in the references appears to relate only to dielectric heating using microwaves at a frequency of 2.45 GHz, further information is needed to support a heat treatment using other frequencies. Torgovnikov (1993) lists the frequency bands in the electromagnetic spectrum that can be used for Industrial, Scientific and Medical purposes both worldwide and in particular countries. It is conceivable that some countries may choose to use frequencies other than 2.45 GHz. One of the factors influencing the penetration depth of the electric field into the wood is frequency (Torgovnikov 1993, his Figures 9.2 & 9.3 for example). Ref: Torgovnikov G. I. 1993. Dielectric Properties of Wood and Wood-Based Materials. New York: Springer-Verlag. | Australia |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| [25] | 7 | Substantive | This treatment applies to the heat treatment of wood packaging material using dielectric heat to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and other quarantine pests ~~those pests required~~ to meet the criteria for treatment as prescribed in ISPM 15. | The treatment should be effective against all pests associated with wood packaging material as prescribed in ISPM 15. | Costa Rica ,Nicaragua ,El Salvador |
| [26] | 7 | Substantive | This treatment applies to the heat treatment of wood packaging material using dielectric heat to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and ~~those~~ other quarantine pests ~~required~~ to meet the criteria ~~for treatment as~~ prescribed in ISPM 15. | The treatment should be effective against all the pests associated with wood packaging material as prescribed in ISPM 15 | Uruguay |
| [27] | 7 | Substantive | This treatment applies to the heat treatment of wood packaging material using dielectric heat to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and ~~those pests required~~other quarantine pests to meet the criteria ~~for treatment as~~ prescribed in ISPM 15. | The treatment should be effective against all the pests associated with wood packaging material as prescribed in ISPM 15. | COSAVE,Paraguay ,Argentina ,Chile,Brazil |
| [28] | 7 | Substantive | This treatment applies to the heat treatment of wood packaging material using dielectric heat to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | The scope should specify whether this treatment is supposed to be equivalent or different from the previous heat treatments. This item should be addressed as it states in the scope that this treatment also applies to “those pests required to meet the criteria for treatment as prescribed in ISPM 15”. | United States of America |
| [29] | 7 | Substantive | This treatment applies to the heat treatment of wood packaging material using dielectric heat to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and other quarantine pests ~~those pests required~~ to meet the criteria for treatment as prescribed in ISPM 15. | The treatment should be effective against all the pests associated with wood packaging material as prescribed in ISPM 15. | OIRSA |
| [30] | 7 | Technical | This treatment applies to the heat treatment of wood packaging material using dielectric heat to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | To put footnote [24] on the first page | EPPO,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |
| [31] | 7 | Technical | This treatment applies to the heat treatment of wood packaging material using dielectric heat to reduce the risk of introduction and spread of all pests of wood including Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | Of all pests, ALB and PNW are the most tolerant to heat treatment. | Philippines ,Japan ,Korea, Republic of ,Viet Nam ,India |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| [32] | 7 | Technical | This treatment applies to the heat treatment of wood packaging material using dielectric radiation ~~heat~~ to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | Heating is achieved using dielectric radiation. To be consistent with comments on ISPM 15:2009 draft revision of Annex 1. | Costa Rica ,Nicaragua ,El Salvador |
| [33] | 7 | Technical | This treatment applies to the heat treatment of wood packaging material using dielectric ~~heat~~ radiation to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of Annex 1 | Uruguay |
| [34] | 7 | Technical | This treatment applies to the heat treatment of wood packaging material using dielectric ~~heat~~radiation to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of Annex 1 | COSAVE,Paraguay ,Argentina ,Chile,Brazil |
| [35] | 7 | Technical | This treatment applies to the heat treatment of wood packaging material using dielectric heat to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), ~~pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1~~ and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | PWN are more tolerant that ALB, and also it is hard to evaluate the results of treatment. | China |
| [36] | 7 | Technical | This treatment applies to the heat treatment of wood packaging material using dielectric heat to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | To put footnote [24] on the first page | European Union |
| [37] | 7 | Technical | This treatment applies to the heat treatment of wood packaging material using dielectric radiation ~~heat~~ to reduce the risk of introduction and spread of Asian longhorned beetle (*Anoplophora glabripennis*) (ALB), pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)1 and those pests required to meet the criteria for treatment as prescribed in ISPM 15. | | OIRSA |
| [38] | 9 | Substantive | **Name of treatment** Heat treatment of wood packaging material using dielectric heat in the following radio frequency and microwave frequency bands [list of bands] | Specify the frequencies this standard applies to. The published data referred to in the references appears to relate only to dielectric heating using microwaves at a frequency of 2.45 GHz, further information is needed to support a heat treatment using other frequencies. Torgovnikov (1993) lists the frequency bands in the electromagnetic spectrum that can be | Australia |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | used for Industrial, Scientific and Medical purposes both worldwide and in particular countries. It is conceivable that some countries may choose to use frequencies other than 2.45 GHz. One of the factors influencing the penetration depth of the electric field into the wood is frequency (Torgovnikov 1993, his Figures 9.2 & 9.3 for example). Ref: Torgovnikov G. I. 1993. Dielectric Properties of Wood and Wood-Based Materials. New York: Springer-Verlag. | |
| [39] | 9 | Technical | **Name of treatment** Heat treatment of wood packaging material using dielectric heating [FOOTNOTE 2]<br>Add a footnote 2: "Dielectric heating is based on the alternating electrical field of the electromagnetic wave emitted by the dielectric radiation source (e.g. microwave or radio frequency). Chemical compounds with asymmetric charge distribution (dipole characters (e.g. water)) orientate and oscillate with the electric field. The friction generated through this process converts electric energy to heat." | correct term: 'heating' Insertion of footnote: more appropriate place for text proposed for deletion from draft Annex 1 to ISPM 15 | EPPO,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |
| [40] | 9 | Technical | **Name of treatment** Heat treatment of wood packaging material using dielectric radiation ~~heat~~ | Heating is achieved using dieletric radiation. To be consistent with comments to ISPM 15:2009 draft revision of Annex 1. | Costa Rica ,Uruguay ,Nicaragua ,El Salvador |
| [41] | 9 | Technical | **Name of treatment** Heat treatment of wood packaging material using dielectric ~~heat~~radiation | Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of Annex 1 | COSAVE,Paraguay ,Chile,Brazil |
| [42] | 9 | Technical | **Name of treatment** Heat treatment of wood packaging material using dielectric heating [FOOTNOTE 2]<br>Add a footnote 2: "Dielectric heating is based on the alternating electrical field of the electromagnetic wave emitted by the dielectric radiation source (e.g. microwave or radio frequency). Chemical compounds with asymmetric charge distribution (dipole characters (e.g. water)) orientate and oscillate with the electric field. The friction generated through this process converts electric energy to heat." | correct term: 'heating' Insertion of footnote: more appropriate place for the text proposed for deletion from draft Annex 1 to ISPM 15. | European Union |
| [43] | 9 | Technical | **Name of treatment** Heat treatment of wood packaging material using dielectric ~~heat~~ radiation | Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of Annex 1 | Argentina |
| [44] | 9 | Technical | **Name of treatment** Heat treatment of wood packaging material using dielectric radiation ~~heat~~ | Heating is achieved using dielectric radiation. To be consistent with comments | OIRSA |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | to ISPM 15:2009 draft revision of Annex 1 | |
| [45] | 11 | Editorial | **Treatment type** Heating | To clarify what is meant with the word "Heat", as heat is difficult to understand. | EPPO,Russian Federation ,European Union ,Ukraine ,Morocco ,Uzbekistan |
| [46] | 11 | Editorial | **Treatment type** ~~Heat~~ Dielectric heat | More specific to the process as there are various heat treatments | Australia |
| [47] | 11 | Substantive | **Treatment type** Heat | Include what type of heat. The draft does not state what type of heat. | United States of America |
| [48] | 12 | Editorial | **Target pest** ~~Asian longhorned beetle (~~*Anoplophora glabripennis*~~)~~ ~~(ALB)~~Motschulsky (Coleoptera: Cerambycidae) and ~~pinewood nematode (~~*Bursaphelenchus xylophilus*~~) (PWN)~~(Steiner & Buhrer) Nickle (Nematoda: Aphelenchoididae). | In consistency with other treatments, in section 'Target pest' the name of a pest should be accompanied by the name of the author of pest's Latin name along with the names of the family and the order. Common names shouldn't be used. | EPPO,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |
| [49] | 12 | Editorial | **Target pest** ~~Asian longhorned beetle (~~*Anoplophora glabripennis*~~)~~ ~~(ALB)~~Motschulsky (Coleoptera: Cerambycidae) and ~~pinewood nematode (~~*Bursaphelenchus xylophilus*~~) (PWN)~~(Steiner & Buhrer) Nickle (Nematoda: Aphelenchoididae). | In consistency with other treatments, in section 'Target pest' the name of a pest should be accompanied by the name of the author of pest's Latin name along with the names of the family and the order. Common names shouldn't be used. | European Union |
| [50] | 12 | Substantive | **Target pest** ~~Asian longhorned beetle (*Anoplophora glabripennis*) (ALB) and pinewood nematode (*Bursaphelenchus xylophilus*) (PWN).~~ | This limited pest list is not consistent with the draft IPPC document: "Submission of new treatments for inclusion in ISMP 15" released for comment in 2010, the draft IPPC document identifies many more pest groups that need to be considered. At a minimum, a reference is necessary that indicates that the data based on these two taxa is representative of the efficacy of the treatment against all pest groups of concern. | Australia |
| [51] | 12 | Substantive | **Target pest** Asian longhorned beetle (*Anoplophora glabripennis*) (ALB) and pinewood nematode (*Bursaphelenchus xylophilus*) (PWN) and those pests required to meet the criteria for treatment as prescribed in ISPM 15.. | To be consistent with paragraph 7 | Yemen ,Oman |
| [52] | 12 | Substantive | **Target pest** Asian longhorned beetle (*Anoplophora glabripennis*) (ALB) ~~and~~ pinewood nematode (*Bursaphelenchus xylophilus*) (PWN)~~.~~and other quarantine pests associated with wood packaging material. | The treatment should be effective against all the pests associated with wood packaging material as prescribed in ISPM | Costa Rica ,Uruguay ,Nicaragua ,El Salvador |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
|---|---|---|---|---|---|
| | | | | 15. | |
| [53] | 12 | Substantive | **Target pest** Asian longhorned beetle (*Anoplophora glabripennis*) (ALB) ~~and~~ pinewood nematode (*Bursaphelenchus xylophilus*) (PWN) and other quarantine pests associated with packaging material. | The treatment should be effective against all the pests associated with wood packaging material as prescribed in ISPM 15. | COSAVE,Paraguay ,Chile,Brazil |
| [54] | 12 | Substantive | **Target pest** Larvae and pupae of Asian longhorned beetle (*Anoplophora glabripennis (Motschulsky)*) (ALB) and all stages of the pinewood nematode (*Bursaphelenchus xylophilus (Steiner & Buhrer) Nickle*) (PWN). | Describing authority of pests should be included for consistency with other ISPMs. Life stages that the treatment affects should be included as it adds consistency to other parts of the document that mention this (paragraph 16). | United States of America |
| [55] | 12 | Substantive | **Target pest** Asian longhorned beetle (*Anoplophora glabripennis*) (ALB) and pinewood nematode (*Bursaphelenchus xylophilus*) (PWN).and other quarantine pests associated with packaging material. | The treatment should be effective against all the pests associated with wood packaging material as prescribed in ISPM 15. | Argentina |
| [56] | 12 | Substantive | **Target pest** Asian longhorned beetle (*Anoplophora glabripennis*) (ALB) ~~and~~ pinewood nematode (*Bursaphelenchus xylophilus*) (PWN) and other quarantine pests associated with wood packaging material.. | The treatment should be effective against all the pests associated with wood packaging material as prescribed in ISPM 15. | OIRSA |
| [57] | 12 | Technical | **Target pest** Asian longhorned beetle (*Anoplophora glabripennis*) (ALB) and pinewood nematode (*Bursaphelenchus xylophilus*) (PWN). | This heat treatment is only target Asian longhorned beetle and PNW? | Korea, Republic of |
| [58] | 13 | Substantive | **Target regulated articles** ~~Debarked w~~Wood packaging material ~~not exceeding 20 cm in cross-section~~ | Not to provide any conditions - as this kind of regulated article is called WPM. The condition that the wood should be debarked before the treatment is contradictory to Annex 1 to ISPM 15. | EPPO,Norway ,Russian Federation ,European Union ,Ukraine ,Morocco ,Uzbekistan |
| [59] | 13 | Substantive | **Target regulated articles** ~~Debarked wood not exceeding 20 cm in cross-section~~ | This dimensional limitation is not supported by the references provided, and some explanation is needed as it is not apparent if this restriction is based the on capacity of equipment currently available or on some theoretical consideration. Penetration of microwave power and extent of its attenuation is dependent on a number of interacting parameters including frequency, and wood density, moisture content, temperature, and alignment of the electric field relative to fibre direction (Torgovnikov 1993). | Australia |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| [60] | 13 | Substantive | **Target regulated articles** ~~Debarked w~~Wood not exceeding 20 cm in cross-section | ISPM 15 states that wood can be debarked before or after heat treatment, so this treatment can be carried out on barked wood as long as the bark is removed after treatment. The term is not justified in the way it is used. | United States of America |
| [61] | 13 | Technical | **Target regulated articles** ~~Debarked w~~Wood not exceeding 20 cm in cross-section | It does not affect the efficacy of the treatment whether the wood is debarked or not. ( see Hoover et al., 2010) | Japan |
| [62] | 13 | Technical | **Target regulated articles** Debarked wood not exceeding 20 cm in cross-section | The specifiaction on the size of the wood (not exceeding 20cm in cross section) needs to be clarified with the TPPT. | Philippines ,Viet Nam ,India |
| [63] | 13 | Technical | **Target regulated articles** Debarked wood not exceeding 20 cm in cross-section | The specification on the size of the wood (not exceeding 20cm in cross section) needs to have technical justification. | Korea, Republic of |
| [64] | 13 | Technical | **Target regulated articles** Debarked wood packaging material not exceeding 20 cm in cross-section | The treatment was developed for wood packaging material and was also included in Annex 1 of ISPM 15. | Costa Rica ,Uruguay ,Mexico ,Nicaragua ,El Salvador ,OIRSA |
| [65] | 13 | Technical | **Target regulated articles** Debarked wood packaging material not exceeding 20 cm in cross-section | This treatment was developed for wood packaging material and was also included in annex 1 of the ISPM 15 | COSAVE,Paraguay ,Chile,Brazil |
| [66] | 13 | Technical | **Target regulated articles** Debarked wood packaging material not exceeding 20 cm in cross-section | This treatment was developed for wood packaging material and was also included in annex 1 of the ISPM 15. | Argentina |
| [67] | 15 | Editorial | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood, including the surface. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | the surface is the important measuring spot for microwave treatment | New Zealand |
| [68] | 15 | Editorial | Where the application of heat treatment is undertaken using dielectric ~~radiation~~ heating (e.g. using microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | Consistency | EPPO,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| [69] | 15 | Editorial | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material ~~composed~~ consists of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | better English | Australia |
| [70] | 15 | Editorial | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. ~~Heating to the prescribed temperature must occur within 30 minutes from ambient temperature.~~ Heating from ambient temperature to the prescribed temperature must occur within 30 minutes. | For better understanding. | Costa Rica ,Nicaragua ,El Salvador ,OIRSA |
| [71] | 15 | Editorial | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood in which the widest part of the cross-section does not exceed~~ing~~ 20 cm ~~in cross-section when measured across the smallest dimension of the piece~~ must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | For clarity. | United States of America |
| [72] | 15 | Editorial | Where the application of heat treatment is undertaken using dielectric ~~radiation~~ heating (e.g. using microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | Consistency | European Union |
| [73] | 15 | Substantive | ~~Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature~~.complete redraft required to support 20 cm limit | This dimensional limitation is not supported by the references provided, and some explanation is needed as it is not apparent if this restriction is based the on capacity of equipment currently available or on some theoretical consideration. Penetration of microwave power and extent of its attenuation is dependent on a number of interacting parameters including frequency, and wood density, moisture content, temperature, and alignment of the electric field relative to fibre direction (Torgovnikov 1993). | Australia |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | Additionally it is unclear as to what is meant 'in cross section when measured across the smallest dimension of the piece". Cross section has a particular meaning. Does it mean that the cross section must not exceed 20 cm but any length ok? One dictionary definition gives "a section made by a plane cutting anything transversely, especially at right angles to the longest axis" so don't need the extra text | |
| [74] | 15 | Substantive | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile (inlcuding its surface) of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | The text in brackets added to be consistent with paragraphs 20-23 of Annex 1 of ISPM 15. | Costa Rica ,Nicaragua ,El Salvador |
| [75] | 15 | Substantive | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile (including its surface) of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | Text in brackets added to be consistent with paragraphs 20 and 23 of annex 1 of ISPM 15 | Uruguay |
| [76] | 15 | Substantive | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile (including its surface) of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | Text in brackets added to be consistent with para 20 and 23 of annex 1 of ISPM 15. | COSAVE,Paraguay ,Chile,Brazil |
| [77] | 15 | Substantive | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes ~~from ambient temperature~~. | Is this treatment (60°C at 1 minute) meant to be an equivalent to the other heat treatment (56°C at 30 seconds)? It appears to be more efficacious because it can kill most stages of ALB. Delete "from ambient temperature". It is unclear what ambient temperature means in this instance. Technically, the ambient temperature could be freezing. "Heating to | United States of America |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | the prescribed temperature must occur within 30 minutes" needs to be clarified. | |
| [78] | 15 | Substantive | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood (including its surface). Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | For consistency with the 1st sentence of para14 in the Draft revision of Annex1 of ISPM No.15. | Japan |
| [79] | 15 | Substantive | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated ~~to achieve a minimum of 60 ˚C for 1 minute~~ throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | it is hard to make sure all part have been heated to a minimum of 60 ˚C for 1 minute | China |
| [80] | 15 | Substantive | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile (including its surface) of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | Text in brackets added to be consistent with paragraphs 20 and 23 of annex 1 of ISPM 15. | OIRSA |
| [81] | 15 | Substantive | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile (including its surface) of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | Text in brackets added to be consistent with para 20 and 23 of annex 1 of ISPM 15. | Argentina |
| [82] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material co~~mposed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece~~ must be heated to achieve a minimum of 60 ˚C continuously for 1 minute throughout the entire profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ~~ambient temperature~~ the start of the treatment. Wood packaging material composed of wood exceeding 20 cm in cross-section should not be treated using dielectric heating. | In consistency with Annex 1 to ISPM 15 and better description of the requirement. | EPPO,Norway ,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |
| [83] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not | This time limitation is not supported by the references provided and some | Australia |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. ~~Heating to the prescribed temperature must occur within 30 minutes from ambient temperature.~~redraft to provide suport for 30 minute timeframe | explanation is needed. If it is believed that the organisms being subjected to the treatment might adjust their physiology to be resistant to the treatment, such as through the production of heat shock proteins during a slow ramp-up of temperature, then appropriate references need to be provided. | |
| [84] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | The specifiaction on the size of the wood (not exceeding 20cm in cross section) needs to be clarified with the TPPT. | Philippines ,Japan ,Viet Nam ,India |
| [85] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | The specification on the size of the wood (not exceeding 20cm in cross section) needs to have technical justification. | Korea, Republic of |
| [86] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | Treatment requires that the wood must be heated to achieve 60°C for one minute. So, it is not clear why this requirement must occur within 30 minutes for ambient temperature. Does it mean that if this is not achieved, the treatment schuld be reinitiated? If not, clarified. This sentence should be deleted. | Costa Rica ,Nicaragua ,El Salvador |
| [87] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | Last sentence should be clarified. Treatment requires that the wood must be heated to achieve 60°C for one minute. So, it is not clear why this requirement must occur within 30 minutes from ambient temperature. Does it mean that if this is not achieved, the treatment should be reinitiated?. If not clarified, this sentence should be deleted. | Uruguay |
| [88] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest | Treatment requires that the wood must be heated to achieve 60°C for one minute. So, it is not clear why this requirement | COSAVE,Paraguay ,Chile,Brazil |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | must occur within 30 minutes from ambient temperature. Does it mean that if this is not achieved, the treatment should be reinitiated? If not clarified, this sentence should be deleted. | |
| [89] | 15 | Technical | ~~Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature.~~Treatment provider has to be approved by NPPO. When approving and auditing a heat treatment provider, the National Plant Protection Organization (NPPO) shall ensure that the following factors are appropriately addressed by those involved in treatment: | | China |
| [90] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material co~~mposed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece~~ must be heated to achieve a minimum of 60 ˚C continuously for 1 minute throughout the entire profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ~~ambient temperature~~ the start of the treatment. Wood packaging material composed of wood exceeding 20 cm in cross-section should not be treated using dielectric heating. | In consistency with Annex 1 to ISPM 15 and better description of the requirement. Re 20 cm sentence: see the explanation for the same modification in the draft revision of ISPM 15. | European Union |
| [91] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile (including its surface) of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | Treatment requires that the wood must be heated to achieve 60°C for one minute. So, it is not clear why this requirement must occur within 30 minutes from ambient temperature. Does it mean that if this is not achieved, the treatment should be reinitiated? [9] If not clarified, this sentence should be deleted. | Argentina |
| [92] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves, radio frequency, etc), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | Suggested change is reflective that other options are available for achieving heat treatment through dielectric heat. This comment is also consistent with the comment made to paragraph 19 of the proposed changes to Annex 1 of ISPM 15. | Canada |
| [93] | 15 | Technical | Where the application of heat treatment is undertaken using dielectric | Heating from ambient temp to the | OIRSA |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating from ambient temperature to the prescribed temperature must occur within 30 minutes ~~from ambient temperature~~. | prescribed temperature must occur within 30 minutes. Treatment requires that the wood must be heated to achieve 60°C for one minute. So, it is not clear why this requirement must occur within 30 minutes from ambient temperature. Does it mean that if this is not achieved, the treatment should be reinitiated?. If not clarified, this sentence should be deleted. | |
| [94] | 15 | Translation | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | In the Spanish version this paragraph reads: "Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood exceeding 20 cm in cross-section ..." , which is contrary to the English version. | Costa Rica ,Uruguay ,Nicaragua ,El Salvador |
| [95] | 15 | Translation | Where the application of heat treatment is undertaken using dielectric radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | In the spanish version is this: Cuando se aplique el tratamiento térmico utilizando radiación dieléctrica (por ejemplo, microondas), el embalaje de madera que contenga madera que exceda los 20 cm en sección cruzada, cuando se mida a lo largo de la dimensión más pequeña del pedazo, debe calentarse hasta alcanzar como mínimo 60 ˚C durante 1 minuto en todo el perfil de la madera. El calentamiento a la temperatura prescrita debe ocurrir dentro de los 30 minutos de la temperatura ambiente. Shoul d be read this: Cuando se aplique el tratamiento térmico utilizando radiación dieléctrica (por ejemplo, microondas), el embalaje de madera no debe de exceder los 20 cm en sección cruzada, cuando se mida a lo largo de la dimensión más pequeña del pedazo, debe calentarse hasta alcanzar como mínimo 60 ˚C durante 1 minuto en todo el perfil de la madera. El calentamiento a la temperatura prescrita debe ocurrir dentro de los 30 minutos de la temperatura ambiente. | Mexico |
| [96] | 15 | Translation | Where the application of heat treatment is undertaken using dielectric | In the Spanish version this paragraph | OIRSA |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | radiation (e.g. microwaves), wood packaging material composed of wood not exceeding 20 cm in cross-section when measured across the smallest dimension of the piece must be heated to achieve a minimum of 60 ˚C for 1 minute throughout the profile of the wood. Heating to the prescribed temperature must occur within 30 minutes from ambient temperature. | reads “Where the application of heat treatment is undertaken using dielectric radiation, wood packaging material composed of wood exceeding 20 cm in cross-section…”, which is contrary to English version | |
| [97] | 16 | Substantive | Efficacy and confidence level of the treatment to kill ~~the larvae and pupae of *Anoplophora glabripennis* and~~ all life stages of *Bursaphelenchus xylophilus* are greater than ED99.99683 at the 95% confidence level. | Redraft required to use references that support efficacy claim for insects. The references listed do not demonstrate the claimed efficacy for larvae and pupae of Anoplophora glabripennis the reference used by the TPPT as a basis for this (Fleming et al., 2003, see paragraph 21 below) The Fleming et al., 2003 paper reports a study that involved in total 90 larvae and 7 pupae of the Asian longhorned beetle placed into holes drilled into wooden blocks - these numbers are far too small to demonstrate efficacy at an ED99.99683 at the 95% confidence level, nor was there any modelling done based on the data obtained. Nzokou et al. (2008, his Table 2) reported that emerald ash borer adults emerged from naturally infested small logs after heating to 65˚C in a microwave. It is not possible to determine how long the temperature was maintained or how even its distribution was in the log from the information provided in their paper. Ref: Nzokou P, Tourtellot S, Kamdem D (2008) Kiln and microwave heat treatment of logs infested by the emerald ash borer (Agrilus planipennis Fairmaire) (Coleoptera : Buprestidae). Forest Products Journal 58 (7-8): 68-72. | Australia |
| [98] | 16 | Substantive | Efficacy and confidence level of the treatment to kill the larvae and pupae of *Anoplophora glabripennis* and all life stages of *Bursaphelenchus xylophilus* are greater than ED99.99683 at the 95% confidence level. | The Draft Annex should not apply Probit 9 or greater than Probit 9 to B. xylophilus. This is unreasonable as pine wood nematode can only be surveyed for visually. This work implies that Probit 9 would be criteria that could be used for treatment of this pest. This is not a | United States of America |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | reasonable criterion. | |
| [99] | 17 | Substantive | When approving and auditing a heat treatment provider, the National Plant Protection Organization (NPPO) ~~shall~~must ensure that the following factors are appropriately addressed by those involved in treatment: | 'shall' is convention language and this is not part of the Convention text. Replace with must or should | Australia |
| [100] | 17 | Substantive | The dielectric heat treatment provider must be approved by the NPPO. When approving and auditing a heat treatment provider, the National Plant Protection Organization (NPPO) shall ensure that the following factors are appropriately addressed by those involved in treatment: | Clarification | Philippines ,Korea, Republic of ,Japan ,Viet Nam ,India |
| [101] | 17 | Substantive | ~~When approving and auditing a heat treatment provider, the National Plant Protection Organization (NPPO) shall ensure that the following factors are appropriately addressed by those involved in treatment:~~Treatment provider has to be approved by NPPO. When approving and auditing a heat treatment provider, the National Plant Protection Organization (NPPO) shall ensure that the following factors are appropriately addressed by those involved in treatment: | | China |
| [102] | 18 | Editorial | • The treatment needs to be monitored where the temperature is likely to be the coldest in the commodity to ensure the target temperature is maintained.<br>• Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated ~~at a frequency specified by the NPPO.~~as per manufactures instructions. ~~-~~ | dot point 1 - Need to add if this refers to the commodity or chamber as it is ambiguous. There is also no reference how this is recorded for auditing purposes. last dot point To save the introduction of varying requirements between NPPOs and added complexity name the timeframe. last dot point - To save the introduction of varying requirements between NPPOs and added complexity name the timeframe. | Australia |
| [103] | 18 | Editorial | • The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained.<br>• Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the | For purpose of clarity | Singapore |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
|---|---|---|---|---|---|
| | | | prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute throughout the profile of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO. | | |
| [104] | 18 | Substantive | • The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained based on guidance provided by the IPPC.<br>• ~~Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile of the wood.~~<br>• ~~For measuring the surface temperature at least two temperature sensors should be used.~~Temperature readings must be recorded on the treatment records.<br>• ~~For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.~~<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO. | dot point 1 - The point that this misses is that unless the load is uniform in every way (size, shape, density, moisture content, temperature) from one piece or batch to the next then the coldest area associated with the load will change and not necessarily in any easily predictable way. dot point 2 - redraft to specify how volidation of temperature monitoring should occur. Specify how this should be done as it is not apparent that the standard appreciates the complexity of this task. Some of the challenges associated with monitoring the treatment temperature are identified below. Monitoring treatment temperature. Penetration of microwave power and extent of its attenuation is dependent on a number of interacting parameters including frequency, and wood density, moisture content, temperature, and alignment of the electric field relative to fibre direction (Torgovnikov 1993). The interaction of these parameters will be one factor determining the temperature achieved at any point in the heated timber. Moisture content, density, temperature and fibre direction can vary within a length of timber or between pieces of timber. The distribution of power in a microwave | Australia |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | system is not even (eg Bradshaw et al. 1997), it is also influenced by shape (Chamchong and Datta 1999), size and placement of the load in the system. Wood is not a perfect load and some power is reflected from the wood, this energy bounces off the wood on to, and then off the walls of the chamber setting up standing waves. The resultant interference pattern creates uneven energy distribution as waves of energy add and cancel out at different points in the chamber including in the wood. Hence energy will not be distributed evenly in the wood and therefore hot and cold areas will occur during heating. In laboratory experiments involving microwave heating, temperatures are either measured at the surface or internally. 1. Surface temperatures – experimenters usually measure one or more surfaces with probes (there seems to be no obvious approach for determining the optimal places for attaching probes), or with forward looking infrared technology (FLIR). 2. Internal temperatures – inferred from surface temperature measurements, or measured by probes inserted into the wood (there seems to be no obvious approach for determining the optimal places spatially for inserting probes), or potentially measured by magnetic resonance imaging (see Amin et al. 2007, Nott et al. 1999 although it seems unlikely this could be applied outside of a research laboratory). The industrial/commercial application of microwave dielectric heating seems likely to use one of three process scenarios. 1. Batch processing in a multimode chamber, potentially in equipment such as shown for example made by Ferrite Microwave Technologies http://www.ferriteinc.com/products_multimode.html 2. Conveyor processing through | |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | a multimode chamber eg Bisceglia et al. 2010 3. Conveyor processing through a waveguide applicator eg systems described in Torgovnikov & Vinden (2009, 2010) To gain the best chance of having an even and repeatable distribution of heat in the wood using any of the process scenarios identified, it seems likely that timber of uniform dimensions and quality be treated in batches. Sending timber of different moisture contents, density and thickness through a commercial process line seems likely to achieve uneven heating and potentially poor treatment of the timber. Given the often poor quality and high variability in dimensions and composition of wood packing material it seems critical that some form of effective temperature monitoring be implemented. However, it is not obvious how this can be done at the scale it is needed. It is also not obvious from the experimental data how much tolerance exists around the 60˚C for 1 minute requirement before treatment ceases to be effective. Amin MHG, Nott KP, Hall LD (2007) Quantification by magnetic resonance imaging of heating commercial baby foods in glass jars. International Journal of Food Science and Technology 42: 1408-1415. Bisceglia B, De Leo R, Diaferia N (2010) MW pallets disinfestations. Journal of Microwave Power and Electromagnetic Energy 43: 4-16. Bradshaw S, Delport S, Wyk E.van (1997). Qualitative measurement of heating uniformity in a multimode microwave cavity. Journal of Microwave power and electromagnetic energy 32 (2) 87-95. Chamchong M, Datta AK (1999) Thawing of foods in a microwave oven: II Effect of load geometry and dielectric properties. Journal of Microwave power and electromagnetic energy 34 (1) 22-32. Nott | |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | KP, Hall LD, Bows JR, Hale M, Patrick ML (1999) Three-dimensional MRI mapping of microwave induced heating patterns. International Journal of Food Science and Technology 34: 305-315. Torgovnikov G, Vinden P (2009) High-intensity microwave wood modification for increasing permeability. Forest Products Journal 59 (4): 84-92. Torgovnikov G, Vinden P (2010) Microwave wood modification technology and its applications. Forest Products Journal 60 (2): 173-182. 3rd dot point - complete redrafting required to account for complexity to be found in distribution of temperatures in wood heated by microwaves. This might be fine if the wood is a small uniform sphere and only one surface is present, but with a rough sawn piece of green wood with variable: density (heartwood - sapwood, branch insertions); thickness; moisture content; and a metre or more long being used as dunnage, where on which of the six sides would the two temperature sensors be placed? Some of the challenges associated with monitoring the treatment temperature are identified below. Monitoring treatment temperature. Penetration of microwave power and extent of its attenuation is dependent on a number of interacting parameters including frequency, and wood density, moisture content, temperature, and alignment of the electric field relative to fibre direction (Torgovnikov 1993). The interaction of these parameters will be one factor determining the temperature achieved at any point in the heated timber. Moisture content, density, temperature and fibre direction can vary within a length of timber or between pieces of timber. The distribution of power in a microwave system is not even (eg Bradshaw et al. 1997), it is also influenced by shape | |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | (Chamchong and Datta 1999), size and placement of the load in the system. Wood is not a perfect load and some power is reflected from the wood, this energy bounces off the wood on to, and then off the walls of the chamber setting up standing waves. The resultant interference pattern creates uneven energy distribution as waves of energy add and cancel out at different points in the chamber including in the wood. Hence energy will not be distributed evenly in the wood and therefore hot and cold areas will occur during heating. In laboratory experiments involving microwave heating, temperatures are either measured at the surface or internally. 3. Surface temperatures – experimenters usually measure one or more surfaces with probes (there seems to be no obvious approach for determining the optimal places for attaching probes), or with forward looking infrared technology (FLIR). 4. Internal temperatures – inferred from surface temperature measurements, or measured by probes inserted into the wood (there seems to be no obvious approach for determining the optimal places spatially for inserting probes), or potentially measured by magnetic resonance imaging (see Amin et al. 2007, Nott et al. 1999 although it seems unlikely this could be applied outside of a research laboratory). The industrial/commercial application of microwave dielectric heating seems likely to use one of three process scenarios. 4. Batch processing in a multimode chamber, potentially in equipment such as shown for example made by Ferrite Microwave Technologies http://www.ferriteinc.com/products_multimode.html 5. Conveyor processing through a multimode chamber eg Bisceglia et al. 2010 6. Conveyor processing through a | |

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| | | | | waveguide applicator eg systems described in Torgovnikov & Vinden (2009, 2010) To gain the best chance of having an even and repeatable distribution of heat in the wood using any of the process scenarios identified, it seems likely that timber of uniform dimensions and quality be treated in batches. Sending timber of different moisture contents, density and thickness through a commercial process line seems likely to achieve uneven heating and potentially poor treatment of the timber. Given the often poor quality and high variability in dimensions and composition of wood packing material it seems critical that some form of effective temperature monitoring be implemented. However, it is not obvious how this can be done at the scale it is needed. It is also not obvious from the experimental data how much tolerance exists around the 60˚C for 1 minute requirement before treatment ceases to be effective. References as for previous point Dot point 3 add sentence - For the purposes of auditing the process records should be kept to validate the treatment success. 4th dot point - Complete redrafting required as proposal will not guarantee uniform heating. There is no apparent reason as to why 2.45 GHZ has been singled out or what the 5 cm dimensional limit is based on. Is there a reason why this frequency and this frequency only has been singled out? Why doesn't the part in the following sentence of this paragraph also apply to wood exceeding 5 cm "uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating"? What is the 5 cm size limit based on? The paper by Bisceglia et al. (2009) appears to show uneven temperature distribution among pallets (his Figure 1) using both multiple | |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | waveguides (separate magnetrons) and a mode stirrer (his Figures 2-4) in an attempt to even-out microwave power distribution in the chamber. Ref: Bisceglia B, De Leo R, Diaferia N (2010) MW pallets disinfestations. Journal of Microwave Power and Electromagnetic Energy 43 4-16. Vinden et al. (2010) heated wood 130 x 220 x 2700 mm using a four port system and measured cross-sectional temperature distribution differences of up to 15 ˚C (their Figure 5). Ref: Vinden P, Torgovnikov G, Hann J (2010) Microwave modification of Radiata pine railway sleepers for preservative treatment. Eur. J. Wood. Prod. DOI 10.1007/s00107-010-0428-8. 4th dot point 2nd sentence - redraft required based on guidance provided by the ippc on how this testing should be done as NPPOs are going to need some detailed guidance on how this should be done, it seems desirable that approaches used be consistent across NPPOs to help provide some surety in the application of the standard across countries. Also what is the process of recording the changes as this could impact upon future treatments if machines are readily changed? It would be easier to have a specific machine fit for a single purpose. | |
| [105] | 18 | Substantive | • The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained.<br>• Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz may require bidirectional application or multiple waveguides for the | There are instances that the NPPO is not the agency conducting calibration. | Philippines ,Korea, Republic of ,Japan ,Viet Nam ,India |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO or its accredited agency. | | |
| [106] | 18 | Substantive | • The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained. The coldest part of the wood will differ depending on the energy sources or processes applied. When using microwaves as a heating source, the coldest part of the wood is the surface.<br>• Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz may require ~~bi~~multidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating.<br>• For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated at intervals~~a frequency~~ specified by the NPPO. | First dashpoint: sentence moved from paragraph 20 to add clarification. Third dashpoint, split into two dashpoints: these are two different thoughts that should be separated. Fourth (new 5th dashpoint): In this instance, this term means something different than the way it is used in other parts of the document regarding microwaves. Use of this term may lead to confusion. | United States of America |
| [107] | 18 | Substantive | ~~• The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained.Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile of the wood. For measuring the surface temperature at least two temperature sensors should be used.For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the~~ | 1)how to monitoring in work? 2) suggest to make a table to show the relationship between what size consignment and the energy of microwave. | China |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | ~~chamber should be tested and equipment modified as needed to ensure uniform heating.Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO.~~<br>• The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained. •<br>• Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile of the wood. For measuring the surface temperature at least two temperature sensors should be used. •<br>• For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating. •<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO. | | |
| [108] | 18 | Technical | • The treatment needs to be monitored where the temperature is likely to be the coldest (usually the surface) to ensure the target temperature is maintained.<br>• Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through ~~the profile of~~ the wood profile. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO or the manufacturer. | reads better | New Zealand |
| [109] | 18 | Technical | • The treatment needs to be monitored at the part of the wood where | - Improved explanation of requirements. - | EPPO,Russian |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | the temperature is likely to be the ~~cold~~lowest (i.e. on the surface of the wood) to ensure the target temperature is maintained.<br>• Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to ~~estimate~~ ensure compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile of the wood including its surfaces. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz ~~may~~ requires bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors ~~including~~ as well as the measurement and recording equipment are calibrated at a frequency specified by the NPPO. | Bullet point 2 - If we say that for wood exceeding 5 cm it "may require" then actually the 1st and the 2nd sentence have the same meaning! - Bullet point 3 - The equipment is not included in the sensors. The opposite is true. | Federation ,Ukraine ,Morocco ,Uzbekistan |
| [110] | 18 | Technical | • The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained.<br>• Irrespective of whether the ~~dielectric~~ heat treatment using dielectric radiation is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile (including its surface) of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric radiation ~~heating~~ at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO.<br>• For purposes of auditing the treatment provider, records of heat treatments and calibration should be retained by treatment providers for a period of time specified by the NPPO. | Heating is achieved using dielectric radiation to be cosistent with comments to ISPM 15:2009 draft revision of Annex 1. Text in brackets added to be consistent to paragraphs 20-23 of annex 1 of ISPM 15:2009. Heating is achieved using dielectric radiation to be cosistent with comments to ISPM 15:2009 draft revision of Annex 1. To be consisten with comments with paragraph 23 of ISPM 15:2009 draft revision of Annex 1. | Costa Rica ,Nicaragua ,El Salvador |
| [111] | 18 | Technical | • The treatment needs to be monitored where the temperature is likely | Heating is achieved using dielectric | Uruguay |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | to be the coldest to ensure the target temperature is maintained.<br>• Irrespective of whether the ~~dielectric~~ heat treatment using dielectric radiation is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile (including its surface) of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric ~~heating~~ radiation at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO.<br>• For purposes of auditing the treatment provider, records of heat treatments and calibration should be retained by treatment providers for a period of time specified by the NPPO | radiation. To be consistent with comments to ISPM 15:2009 draft revision of annex 1 Text in brackets (2nd. bullet) added to be consistent with para 20 and 23 of annex 1 of ISPM 15. New bullet added at the end, to be consistent with comments to paragraph 23 of ISPM 15:2009 draft revision of Annex 1 | |
| [112] | 18 | Technical | • The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained.<br>• Irrespective of whether the ~~dielectric~~ heat treatment using dielectric radiation is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile (including its surface) of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric ~~heating~~ radiation at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO.<br>• For purposes of auditing the treatment provider, records of heat treatments and calibration should be retained by treatment providers for a period of time specified by the NPPO. | "dielectric" was deleted and "using dielectric radiation" added to be consistent with comments to ISPM 15:2009 draft revision of Annex 1 Text in brackets " (including its surface)" was added to be consistent with para 20 and 23 of annex 1 of ISPM 15. Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of annex 1 Text "For purposes of auditing the treatment provider, records of heat treatments and calibration should be retained by treatment providers for a period of time specified by the NPPO" was added to be consistent with comments to para 23 of ISPM 15:2009 draft revision of Annex 1 | COSAVE,Paraguay ,Chile,Brazil |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | | | |
| [113] | 18 | Technical | • The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained.<br>• Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO.<br>• For purpose of auditing the treatment provider, records of heat treatments and calibration should be retained by treatment providers for a period of time specified by the NPPO. | For consistency with the indent 4 of para23 in the Draft revision of Annex 1 of ISPM No.15. | Japan |
| [114] | 18 | Technical | • The treatment needs to be monitored at the part of the wood where the temperature is likely to be the ~~cold~~lowest (i.e. on the surface of the wood) to ensure the target temperature is maintained.<br>• Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to ~~estimate~~ ensure compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile of the wood including its surfaces. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz ~~may~~ requires bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment ~~modified as needed to~~ should ensure uniform heating.<br>• Temperature sensors ~~including~~ as well as the measurement and recording equipment are calibrated at a frequency specified by the NPPO. | - Improved explanation of requirements. - Bullet point 2 - If we say that for wood exceeding 5 cm it "may require" then actually the 1st and the 2nd sentence have the same meaning! - Bullet point 3 - The equipment is not included in the sensors. The opposite is true. | Norway |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| [115] | 18 | Technical | • The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained.<br>• Irrespective of whether the ~~dielectric~~ heat treatment using dialectric radiation is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile (including its surface)<br>•<br>• of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric radiation ~~heating~~ at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO.<br>• For purposes of auditing the treatment provider, records of heat treatments and calibration must be keeping by the treatment providers for the period of time that the NPPO establish.<br>• | According with ISPM 15 draft revision of Annex 1. To be consistent with paragraph 20-23 of annex 1 of ISPM 15. To be consistent with paragraph 23 of ISPM 15 draft revision of annex 1. | Mexico |
| [116] | 18 | Technical | • The treatment needs to be monitored at the part of the wood where the temperature is likely to be the ~~cold~~lowest to ensure the target temperature is maintained.<br>• Irrespective of whether the dielectric heat treatment is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to ~~estimate~~ ensure compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile of the wood including its surfaces. For measuring the surface temperature at least two temperature sensors should be used.<br>• Uniformity of heating for the chamber should be tested and the equipment should ensure uiform heating. For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz ~~may~~ requires bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. ~~For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed~~ | Bullet points 1 and 2: Improved explanation of requirements. Bullet point 3: Changed order of sentences to put the more general requirement first. If we say that for wood exceeding 5 cm it "may require" then actually the 1st and the 2nd sentence have the same meaning! The second sentence may need to be modified pending the result of the review of the scientific evidence (see our general comment). Bullet point 4: The equipment is not included in the sensors. The opposite is true. | European Union |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | ~~to ensure uniform heating.~~<br>• Temperature sensors ~~including~~ as well as the measurement and recording equipment are calibrated at a frequency specified by the NPPO. | | |
| [117] | 18 | Technical | • The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained.<br>• Irrespective of whether the ~~dielectric~~ heat treatment using dielectric radiation is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile (including its surface) of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric radiation ~~heating~~ at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating.<br>• Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO.<br>• - For purposes of auditing the treatment provider, records of heat treatments and calibration should be retained by treatment providers for a period of time specified by the NPPO. | To be consistent with comments to ISPM 15:2009 draft revision of Annex 1 Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of annex 1 Text in brackets added to be consistent with para 20 and 23 of annex 1 of ISPM 15. To be consistent with comments to para 23 of ISPM 15:2009 draft revision of Annex 1 | Argentina |
| [118] | 18 | Technical | • The treatment needs to be monitored where the temperature is likely to be the coldest to ensure the target temperature is maintained.<br>• Irrespective of whether the ~~dielectric~~ heat treatment using dielectric radiation is conducted as a batch process or as a continuous (conveyor) process, if the operator is measuring the surface temperature to estimate compliance with the prescribed standard, the operator should have initially validated through testing that the internal wood temperatures meet or exceed 60 ˚C for 1 minute through the profile (including surface) of the wood. For measuring the surface temperature at least two temperature sensors should be used.<br>• For wood exceeding 5 cm in thickness, dielectric radiation ~~heating~~ at 2.45 GHz may require bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating. For wood less than 5 cm in thickness, uniformity of heating for the chamber should be tested and equipment modified as needed to ensure uniform heating. | 1) Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of annex 1 2) Text in brackets added to be consistent with paragraphs 20 and 23 of annex 1 of ISPM 15. 3) Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of annex 1 4) New bullet added to be consistent with comments to para 23 of ISPM 15:2009 draft revision of Annex 1 | OIRSA |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | • Temperature sensors including the measurement and recording equipment are calibrated at a frequency specified by the NPPO.<br>• For purposes of auditing the treatment provider, records of heat treatments and calibration should be retained by treatment providers for a period of time specified by the NPPO. | | |
| [119] | 19 | Technical | **Other relevant information** | Additional information on monitoring methods and appropriate equipment for measurement should be added.. | Malaysia |
| [120] | 19 | Technical | **Other relevant information** | Additional information on the treatment process, appropriate equipment for measurement, monitoring methods, considerations on wood moisture content, etc. should be requested to the TPPT and should be included in this annex. | Philippines ,Korea, Republic of ,Japan ,Viet Nam ,India |
| [121] | 20 | Editorial | The point at which the wood is coldest ~~part of the wood~~ will ~~differ~~ vary depending on the energy sources or processes applied. When using microwaves as a heating source, the surface is the coldest part of the wood ~~is the surface~~. | More precise and better English | EPPO,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |
| [122] | 20 | Editorial | ~~The coldest part of the wood will differ depending on the energy sources or processes applied. When using microwaves as a heating source, the coldest part of the wood is the surface.~~ | move to paragraph 18 | United States of America |
| [123] | 20 | Technical | The coldest part of the wood will differ depending on the energy sources or processes applied. When using microwaves as a heating source, the coldest part of the wood is generally the surface. | Effect of microwave depends on the water content of the wood. | Philippines ,Korea, Republic of ,Japan ,Viet Nam ,India |
| [124] | 20 | Technical | ~~The coldest part of the wood will differ depending on the energy sources or processes applied~~. When using ~~microwaves~~ dielectric radiation as a heating source, the coldest part of the wood is the surface. | It is not relevant information for this treatment. Heating is achieved using dielectric radiation to be cosistent with comments to ISPM 15:2009 draft revision of Annex 1. | Costa Rica ,Nicaragua ,El Salvador |
| [125] | 20 | Technical | The coldest part of the wood will differ depending on the energy sources or processes applied. When using ~~microwaves~~ dielectric radiation as a heating source, the coldest part of the wood is the surface. | Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of annex 1 | Uruguay |
| [126] | 20 | Technical | The coldest part of the wood will differ depending on the energy sources or processes applied. When using ~~microwaves~~ dielectric radiation as a heating source, the coldest part of the wood is the surface. | Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of annex 1 | COSAVE,Paraguay ,Argentina ,Chile,Brazil |
| [127] | 20 | Technical | ~~The coldest part of the wood will differ depending on the energy sources or processes applied~~. When using ~~microwaves~~ dialectric radiation as a heating | It is not relevant information of this treatment. Heating is aciving using | Mexico |

| Comment no. | Paragraph no. | Comment type | Comment | Explanation | Country |
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| | | | source, the coldest part of the wood is the surface. | dialectric radiation to be consistent with comment of ISPM 15: 2009 draft revision of Annex 1. | |
| [128] | 20 | Technical | The point sat which the wood is coldest ~~part of the wood~~ will vary~~differ~~ depending on the energy sources or processes applied. When using microwaves as a heating source, the surface is usually the coldest part of the wood ~~is the surface~~. | More precise and better English. This point may need to be modified pending the outcome of the review of the scientific evidence (see our general comment). | European Union |
| [129] | 20 | Technical | ~~The coldest part of the wood will differ depending on the energy sources or processes applied.~~ When using ~~microwaves~~ dielectric radiation as a heating source, the coldest part of the wood is the surface. | 1) It is not relevant information for this treatment 2) Heating is achieved using dielectric radiation. To be consistent with comments to ISPM 15:2009 draft revision of Annex 1 | OIRSA |
| [130] | 21 | Editorial | The TPPT based its evaluation of this treatment for ~~ALB~~ *Anoplophora glabripennis* and ~~PWN~~ *Bursaphelenchus xylophilus* on the research work reported respectively by Fleming *et al.*, 2003, and Hoover *et al.*, 2010. | See comment to para 7 | EPPO,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |
| [131] | 21 | Editorial | The Technical Panel on Phytosanitary Treatments (TPPT) based its evaluation of this treatment for ALB and PWN on the research work reported respectively by Fleming *et al.*, 2003, and Hoover *et al.*, 2010. | For clarification | Yemen ,Oman |
| [132] | 21 | Editorial | The TPPT based its evaluation of this treatment for ~~ALB~~ *Anoplophora glabripennis* and ~~PWN~~ *Bursaphelenchus xylophilus* on the research work reported respectively by Fleming *et al.*, 2003, and Hoover *et al.*, 2010. | See comment to para 7 | European Union |
| [133] | 21 | Technical | ~~The TPPT based its evaluation of this treatment for ALB and PWN on the research work reported respectively by Fleming *et al.*, 2003, and Hoover *et al.*, 2010.~~ | Is the TPPT content to admit its evaluation of this entire treatment standard is based on these two references alone? the Hoover et al., 2010 paper is very good but only applies to Bursaphelenchus xylophilus. | Australia |
| [134] | 22 | Editorial | The general effectiveness of this treatment against other pests was supported by Fleming *et al.*, 2004; Henin et al., 2008; Soma *et al.*, 2002, 2003; Tomminen~~, J., Halik, S. and Bergdahl, D.R.~~ *et al.* ,1991 and Tomminen~~, J.~~ and Nuorteva~~, M.~~, 1992. | Put the second "et al." in italics, replace two co-authors by "et al.", and delete initials of the firstnames when existing. | EPPO,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |
| [135] | 22 | Editorial | The general effectiveness of this treatment against other pests was supported by Fleming *et al.*, 2004; Henin et al., 2008; Soma *et al.*, 2002, 2003; Tomminen, J., ~~Halik, S. and Bergdahl, D.R~~et al. ,1991 and Tomminen, J. and Nuorteva, M., 1992. | For consistency | United States of America |

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| [136] | 22 | Editorial | The general effectiveness of this treatment against other pests was supported by Fleming *et al.*, 2004; Henin et al., 2008; Soma *et al.*, 2002, 2003; Tomminen~~, J., Halik, S. and Bergdahl, D.R.~~ *et al.* ,1991 and Tomminen~~, J.~~ and Nuorteva~~, M.~~, 1992. | Put the second "et al." in italics, replace two co-authors by "et al.", and delete initials of the firstnames when existing. | European Union |
| [137] | 22 | Technical | The general effectiveness of this treatment against other pests was supported by Fleming *et al.*, 2004~~;~~ and Henin et al., 2008~~; Soma *et al.*, 2002, 2003; Tomminen, J., Halik, S. and Bergdahl, D.R. ,1991 and Tomminen, J. and Nuorteva, M., 1992~~. | Of these references, only those of Fleming et al., 2004; Henin et al., 2008 are related to dielectric heating, the remaining references do not support the general effectiveness of this treatment against other pests as claimed. There is probably enough evidence from the food industry, research on stored products and other research on timber to show 2.45 GHz microwave energy of sufficient intensity can be used under the appropriate circumstances to kill timber pests and a thorough review of this existing work is needed in the absence specifically targeted work on timber. However, to be an effective treatment for quarantine purposes there needs to be evidence of the efficacy of the concept when it is applied in real world operational conditions such as treating dunnage, pallets, crates etc and being able to cope with the variability in quality of the timber used in ISMP 15 materials. In addition, a reliable method of monitoring of the internal and external temperature is needed for NPPOs to be confident that the treatment has been effectively carried out. A careful reading of the paper by Henin et al. (2008), particularly page 76 and their conclusions will reveal many of the unresolved issues associated with microwave heating. | Australia |
| [138] | 22 | Technical | The general efficacy ~~effectiveness~~ of this treatment against other pests was supported by Fleming *et al.*, 2004; Henin et al., 2008; Soma *et al.*, 2002, 2003; Tomminen, J., Halik, S. and Bergdahl, D.R. ,1991 and Tomminen, J. and Nuorteva, M., 1992. | Efficacy is already defined in ISPM 5. | Costa Rica ,Uruguay ,Nicaragua ,El Salvador |
| [139] | 22 | Technical | The general ~~effectiveness~~ efficacy of this treatment against other pests was supported by Fleming *et al.*, 2004; Henin et al., 2008; Soma *et al.*, 2002, | Efficacy is already defined in ISPM N° 5. | COSAVE,Paraguay |

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| | | | 2003; Tomminen, J., Halik, S. and Bergdahl, D.R. ,1991 and Tomminen, J. and Nuorteva, M., 1992. | | ,Chile,Brazil |
| [140] | 22 | Technical | The general efficacy ~~effectiveness~~ of this treatment against other pests was supported by Fleming *et al.*, 2004; Henin et al., 2008; Soma *et al.*, 2002, 2003; Tomminen, J., Halik, S. and Bergdahl, D.R. ,1991 and Tomminen, J. and Nuorteva, M., 1992. | Efficacy is already define in ISPM 5. | Mexico |
| [141] | 22 | Technical | The general efficacy ~~effectiveness~~ of this treatment against other pests was supported by Fleming *et al.*, 2004; Henin et al., 2008; Soma *et al.*, 2002, 2003; Tomminen, J., Halik, S. and Bergdahl, D.R. ,1991 and Tomminen, J. and Nuorteva, M., 1992. | Efficacy is already defined in ISPM N° 5. | Argentina |
| [142] | 22 | Technical | The general efficacy ~~effectiveness~~ of this treatment against other pests was supported by Fleming *et al.*, 2004; Henin et al., 2008; Soma *et al.*, 2002, 2003; Tomminen, J., Halik, S. and Bergdahl, D.R. ,1991 and Tomminen, J. and Nuorteva, M., 1992. | Efficacy is already defined in ISPM N° 5. | OIRSA |
| [143] | 23 | Editorial | **References**<br>~~**Dubois, T., Hajek, A.E. & Smith, S.** 2002. Methods for rearing the Asian longhorned beetle (Coleoptera: Cerambycidae) on artificial diet. Annals of the Entomological Society of America, 95: 223.~~<br>**Fleming, M., Hoover, K., Janowiak, J., Fang, Y., Wang, X., Liu, W., Wang, Y., Hang, X., Agrawal, D., Mastro, V. & Roy, R.** 2003. Microwave irradiation of solid wood packing material ~~(pallet and crate lumber): An effective technique~~ to destroy the Asian longhorned beetle ~~(Anoplophora glabripennis) hitchhiking to the United States~~. Forest Products Journal, ~~52~~: ~~1–7~~ 53 (1): 46-52.<br>**Fleming, M.R., Janowiak, J.J., Kearns, J., Shield, J.E., Roy, R., Agrawal, D.K., Bauer, L.S., Miller, D.L. & Hoover, K.** 2004. Parameters for scale-up of microwave treatment to eradicate cerambycid larvae infesting solid wood packing materials. Forest Products Journal, 54 (7/8): 80–84.<br>**Henin, J.-M., Charron, S., Luypaert, P.J., Jourez, B. & Hebert, J**. 2008. Strategy to control the effectiveness of microwave treatment of wood in the framework of the implementation of ISPM 15. Forest Products Journal, 58 (12): 75–81.<br>**Hoover, K., Uzunovic, A., Gething, B., Dale, A., Leung, K., Ostiguy, N. & Janowiak, J.J.**2010. Lethal temperature for pinewood nematode, Bursaphelenchus xylophilus, in infested wood using microwave energy. ~~In press~~Journal of Nematology 2010, vol. 42, no2, pp. 101-110 .<br>**Soma, Y., H. Naito, H., Misumi, T., Tsuchiya, Y., Mizobuchi, M., Matsuoka, I., Kawakami, F., Hirata, K. & Komatsu, H.** 2002. Effects of some fumigants on pine wood nematode, Bursaphelenchus xylophilus | Dubois reference - Delete It is not cited in the text and has no relevance to dielectric heating. Fleming 2003 reference - amend, Vol52 is 2002 and the article is as amended Henin reference - need part number of volume Hoover reference - give publication details Journal of Nematology 2010, vol. 42, no2, pp. 101-110 Soma reference - it has no relevance to dielectric heating and its use in the text does not require inclusion here Stamps reference - not cited in text and has no relevance to dielectric heating Tomminen references - no relevance to dielectric heating and its use in the text doesn't require its use here | Australia |

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| | | | infecting wooden packages. 2. Mortality of pine wood nematode by methyl bromide tent fumigation. Research Bulletin of the Plant Protection Service Japan, 38: 13–19.<br>~~**Soma, Y., Goto, M., Naito, H., Ogawa, N., Kawakami, F., Hirata, K., Komatsu, H. & Matsumoto, Y.**2003. Effects of some fumigants on mortality of pine wood nematode, Bursaphelenchus xylophilus infecting wooden packages. 3. Mortality and fumigation standards for pine wood nematode by methyl bromide. Research Bulletin of the Plant Protection Service Japan, 39: 7–14.~~<br>~~**Stamps, W.T. & Linit, M.J.**1995. A rapid and simple method for staining lipid in fixed nematodes. Journal of Nematology, 27: 244–247.**Tomminen, J., Halik, S. & Bergdahl, D.R.** 1991. Incubation temperature and time effects on life stages of Bursaphelenchus xylophilus in wood chips. Journal of Nematology, 23: 477–484.**Tomminen, J. & Nuorteva, M.**1992. Pinewood nematode, Bursaphelenchus xylophilus in commercial sawn wood and its control by kiln-heating. Scandinavian Journal of Forest Research 7: 113–120.~~ | | |
| [144] | 23 | Editorial | **References**<br>**Dubois, T., Hajek, A.E. & Smith, S.** 2002. Methods for rearing the Asian longhorned beetle (Coleoptera: Cerambycidae) on artificial diet. Annals of the Entomological Society of America, 95: 223.<br>**Fleming, M., Hoover, K., Janowiak, J., Fang, Y., Wang, X., Liu, W., Wang, Y., Hang, X., Agrawal, D., Mastro, V. & Roy, R.** 2003. Microwave irradiation of solid wood packing material (pallet and crate lumber): An effective technique to destroy the Asian longhorned beetle (Anoplophora glabripennis) hitchhiking to the United States. Forest Products Journal, 52: 1–7.<br>**Fleming, M.R., Janowiak, J.J., Kearns, J., Shield, J.E., Roy, R., Agrawal, D.K., Bauer, L.S., Miller, D.L. & Hoover, K.** 2004. Parameters for scale-up of microwave treatment to eradicate cerambycid larvae infesting solid wood packing materials. Forest Products Journal, 54 (7/8): 80–84.<br>**Henin, J.-M., Charron, S., Luypaert, P.J., Jourez, B. & Hebert, J**. 2008. Strategy to control the effectiveness of microwave treatment of wood in the framework of the implementation of ISPM 15. Forest Products Journal, 58: 75–81.<br>**Hoover, K., Uzunovic, A., Gething, B., Dale, A., Leung, K., Ostiguy, N. & Janowiak, J.J.**2010. Lethal temperature for pinewood nematode, Bursaphelenchus xylophilus, in infested wood using microwave energy. ~~In press.~~<br>**Soma, Y., H. Naito, H., Misumi, T., Tsuchiya, Y., Mizobuchi, M., Matsuoka, I., Kawakami, F., Hirata, K. & Komatsu, H.** 2002. Effects of some fumigants on pine wood nematode, Bursaphelenchus xylophilus | Is this (Hoover, K.....et al) published yet? This may need to be updated. | United States of America |

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| | | | infecting wooden packages. 2. Mortality of pine wood nematode by methyl bromide tent fumigation. Research Bulletin of the Plant Protection Service Japan, 38: 13–19.<br>**Soma, Y., Goto, M., Naito, H., Ogawa, N., Kawakami, F., Hirata, K., Komatsu, H. & Matsumoto, Y.**2003. Effects of some fumigants on mortality of pine wood nematode, Bursaphelenchus xylophilus infecting wooden packages. 3. Mortality and fumigation standards for pine wood nematode by methyl bromide. Research Bulletin of the Plant Protection Service Japan, 39: 7–14.<br>**Stamps, W.T. & Linit, M.J.**1995. A rapid and simple method for staining lipid in fixed nematodes. Journal of Nematology, 27: 244–247.<br>**Tomminen, J., Halik, S. & Bergdahl, D.R.** 1991. Incubation temperature and time effects on life stages of Bursaphelenchus-xylophilus in wood chips. Journal of Nematology, 23: 477–484.<br>**Tomminen, J. & Nuorteva, M.**1992. Pinewood nematode, Bursaphelenchus xylophilus in commercial sawn wood and its control by kiln-heating. Scandinavian Journal of Forest Research 7: 113–120. | | |
| [145] | 23 | Technical | **References**<br>**Dubois, T., Hajek, A.E. & Smith, S.** 2002. Methods for rearing the Asian longhorned beetle (Coleoptera: Cerambycidae) on artificial diet. Annals of the Entomological Society of America, 95: 223.<br>**Fleming, M., Hoover, K., Janowiak, J., Fang, Y., Wang, X., Liu, W., Wang, Y., Hang, X., Agrawal, D., Mastro, V. & Roy, R.** 2003. Microwave irradiation of solid wood packing material (pallet and crate lumber): An effective technique to destroy the Asian longhorned beetle (Anoplophora glabripennis) hitchhiking to the United States. Forest Products Journal, 52: 1–7.<br>**Fleming, M.R., Janowiak, J.J., Kearns, J., Shield, J.E., Roy, R., Agrawal, D.K., Bauer, L.S., Miller, D.L. & Hoover, K.** 2004. Parameters for scale-up of microwave treatment to eradicate cerambycid larvae infesting solid wood packing materials. Forest Products Journal, 54 (7/8): 80–84.<br>**Henin, J.-M., Charron, S., Luypaert, P.J., Jourez, B. & Hebert, J**. 2008. Strategy to control the effectiveness of microwave treatment of wood in the framework of the implementation of ISPM 15. Forest Products Journal, 58: 75–81.<br>**Hoover, K., Uzunovic, A., Gething, B., Dale, A., Leung, K., Ostiguy, N. & Janowiak, J.J.**2010. Lethal temperature for pinewood nematode, Bursaphelenchus xylophilus, in infested wood using microwave energy. ~~In press.~~Journal of Nematology 42 (2), 101-110.<br>**Soma, Y., H. Naito, H., Misumi, T., Tsuchiya, Y., Mizobuchi, M.,** | - Reference "Hoover et al.": Update this reference as this article has been published now: add "Journal of Nematology 42 (2), 101-110". - Reference "Tomminen et al.": Delete the "-" between "Bursaphelenchus" and "xylophilus" and replace it by a blank. | EPPO,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |

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| | | | **Matsuoka, I., Kawakami, F., Hirata, K. & Komatsu, H.** 2002. Effects of some fumigants on pine wood nematode, Bursaphelenchus xylophilus infecting wooden packages. 2. Mortality of pine wood nematode by methyl bromide tent fumigation. Research Bulletin of the Plant Protection Service Japan, 38: 13–19.<br>**Soma, Y., Goto, M., Naito, H., Ogawa, N., Kawakami, F., Hirata, K., Komatsu, H. & Matsumoto, Y.**2003. Effects of some fumigants on mortality of pine wood nematode, Bursaphelenchus xylophilus infecting wooden packages. 3. Mortality and fumigation standards for pine wood nematode by methyl bromide. Research Bulletin of the Plant Protection Service Japan, 39: 7–14.<br>**Stamps, W.T. & Linit, M.J.**1995. A rapid and simple method for staining lipid in fixed nematodes. Journal of Nematology, 27: 244–247.<br>**Tomminen, J., Halik, S. & Bergdahl, D.R.** 1991. Incubation temperature and time effects on life stages of Bursaphelenchus- xylophilus in wood chips. Journal of Nematology, 23: 477–484.<br>**Tomminen, J. & Nuorteva, M.**1992. Pinewood nematode, Bursaphelenchus xylophilus in commercial sawn wood and its control by kiln-heating. Scandinavian Journal of Forest Research 7: 113–120. | | |
| [146] | 23 | Technical | **References**<br>~~**Dubois, T., Hajek, A.E. & Smith, S.** 2002. Methods for rearing the Asian longhorned beetle (Coleoptera: Cerambycidae) on artificial diet. Annals of the Entomological Society of America, 95: 223.~~<br>**Fleming, M., Hoover, K., Janowiak, J., Fang, Y., Wang, X., Liu, W., Wang, Y., Hang, X., Agrawal, D., Mastro, V. & Roy, R.** 2003. Microwave irradiation of solid wood packing material (pallet and crate lumber): An effective technique to destroy the Asian longhorned beetle (Anoplophora glabripennis) hitchhiking to the United States. Forest Products Journal, 52: 1–7.<br>**Fleming, M.R., Janowiak, J.J., Kearns, J., Shield, J.E., Roy, R., Agrawal, D.K., Bauer, L.S., Miller, D.L. & Hoover, K.** 2004. Parameters for scale-up of microwave treatment to eradicate cerambycid larvae infesting solid wood packing materials. Forest Products Journal, 54 (7/8): 80–84.<br>**Henin, J.-M., Charron, S., Luypaert, P.J., Jourez, B. & Hebert, J**. 2008. Strategy to control the effectiveness of microwave treatment of wood in the framework of the implementation of ISPM 15. Forest Products Journal, 58: 75–81.<br>**Hoover, K., Uzunovic, A., Gething, B., Dale, A., Leung, K., Ostiguy, N. & Janowiak, J.J.**2010. Lethal temperature for pinewood nematode, Bursaphelenchus xylophilus, in infested wood using microwave energy. ~~In~~ | - There is no reference in the text to the two papers proposed for delition - Reference "Hoover et al.": Update this reference as this article has been published now: add "Journal of Nematology 42 (2), 101-110". - Reference "Tomminen et al.": Delete the "-" between "Bursaphelenchus" and "xylophilus" and replace it by a blank. | European Union |

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| | | | press.Journal of Nematology 42 (2), 101-110.<br>**Soma, Y., H. Naito, H., Misumi, T., Tsuchiya, Y., Mizobuchi, M., Matsuoka, I., Kawakami, F., Hirata, K. & Komatsu, H.** 2002. Effects of some fumigants on pine wood nematode, Bursaphelenchus xylophilus infecting wooden packages. 2. Mortality of pine wood nematode by methyl bromide tent fumigation. Research Bulletin of the Plant Protection Service Japan, 38: 13–19.<br>**Soma, Y., Goto, M., Naito, H., Ogawa, N., Kawakami, F., Hirata, K., Komatsu, H. & Matsumoto, Y.**2003. Effects of some fumigants on mortality of pine wood nematode, Bursaphelenchus xylophilus infecting wooden packages. 3. Mortality and fumigation standards for pine wood nematode by methyl bromide. Research Bulletin of the Plant Protection Service Japan, 39: 7–14.<br>**Stamps, W.T. & Linit, M.J.**1995. A rapid and simple method for staining lipid in fixed nematodes. Journal of Nematology, 27: 244–247.<br>**Tomminen, J., Halik, S. & Bergdahl, D.R.** 1991. Incubation temperature and time effects on life stages of Bursaphelenchus- xylophilus in wood chips. Journal of Nematology, 23: 477–484.<br>**Tomminen, J. & Nuorteva, M.**1992. Pinewood nematode, Bursaphelenchus xylophilus in commercial sawn wood and its control by kiln-heating. Scandinavian Journal of Forest Research 7: 113–120. | | |
| [147] | 24 | Technical | 1 The scope of phytosanitary treatments does not include issues related to pesticide registration or other domestic requirements for approval of treatments. Treatments also do not provide information on specific effects on human health or food safety, which should be addressed using domestic procedures prior to approval of a treatment. In addition, potential effects of treatments on product quality are considered for some host commodities before their international adoption. However, evaluation of any effects of a treatment on the quality of commodities may require additional consideration. There is no obligation for a contracting party to approve, register or adopt the treatments for use in its territory. | To put footnote on the first page | EPPO,Russian Federation ,Ukraine ,Morocco ,Uzbekistan |
| [148] | 24 | Technical | 1 The scope of phytosanitary treatments does not include issues related to pesticide registration or other domestic requirements for approval of treatments. Treatments also do not provide information on specific effects on human health or food safety, which should be addressed using domestic procedures prior to approval of a treatment. In addition, potential effects of treatments on product quality are considered for some host commodities before their international adoption. However, evaluation of any effects of a treatment on the quality of commodities may require additional consideration. There is no obligation for a contracting party to approve, register or adopt the | Put the footnote on the first page | European Union |

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| | | | treatments for use in its territory. | | |