



**[1]Draft revision of Annex 1 (Approved treatments associated with wood packaging material) and Annex 2 (The mark and its application) to ISPM 15 (Regulation of wood packaging material in international trade): inclusion of the phytosanitary treatment Sulphuryl fluoride fumigation and Revision of the dielectric heating section (2006-010A&B)**

<b>[2]Status box</b>	
<b>[3]</b> <i>This is not an official part of the standard and it will be modified by the IPPC Secretariat after adoption.</i>	
<b>[4]Date of this document</b>	<b>[5]</b> 2017-11-24
<b>[6]Document category</b>	<b>[7]</b> Draft revision of Annexes 1 and 2 to ISPM 15 ( <i>Regulation of wood packaging material in international trade</i> )
<b>[8]Current document stage</b>	<b>[9]</b> From Standards Committee (SC) November 2017 to CPM-13 (2018)
<b>[10]Major stages for the phytosanitary treatment Sulphuryl fluoride fumigation</b>	<p><b>[11]</b>2006-09 <i>Sulfuryl fluoride fumigation of wood packaging material treatment</i> (2007-101) submitted</p> <p><b>[12]</b>2006-12 Technical Panel on Phytosanitary Treatments (TPPT) reviewed treatment</p> <p><b>[13]</b>2007-07 Revised text considered by Technical Panel on Forest Quarantine (TPFQ)</p> <p><b>[14]</b>2007-12 Further revised text submitted to TPPT</p> <p><b>[15]</b>2008-12 TPFQ discussion</p> <p><b>[16]</b>2009-01 TPPT reviewed treatment</p> <p><b>[17]</b>2009-07 Amended text considered by TPFQ</p> <p><b>[18]</b>2010-07 Text updated and recommended to SC</p> <p><b>[19]</b>2010-09 TPFQ discussion</p> <p><b>[20]</b>2011-04 SC e-decision</p> <p><b>[21]</b>2011-05 SC via e-discussion returned to TPPT</p> <p><b>[22]</b>2011-07 TPPT revised text based on SC comments</p> <p><b>[23]</b>2011-10 TPPT reviewed treatment</p> <p><b>[24]</b>2012-02 TPFQ discussion</p> <p><b>[25]</b>2012-12 TPPT reviewed treatment</p> <p><b>[26]</b>2014-06 TPPT recommended treatment to SC for approval for consultation</p> <p><b>[27]</b>2014-09 SC approved for consultation via e-decision</p> <p><b>[28]</b>2014-11 SC agreed to split <i>Sulfuryl fluoride fumigation of wood packaging material</i> (2007-101) into two separate topics: <i>Sulfuryl fluoride fumigation of insects in debarked wood</i> (2007-101A) and <i>Sulfuryl fluoride fumigation of nematodes and insects in debarked wood</i> (2007-101B) and recommended to CPM to include a new topic: Revision of dielectric heating section (Annex 1 (<i>Approved treatments associated with wood packaging material</i>) to ISPM 15 (<i>Regulation of wood packaging material in international trade</i>))</p> <p><b>[29]</b>2014-12 TPFQ reviewed the draft treatment <i>Sulfuryl fluoride fumigation of nematodes and insects in debarked wood</i> (2007-101B) for inclusion to ISPM 15 (2006-010A)</p> <p><b>[30]</b>2015-05 SC reviewed and approved draft revision to ISPM 15 in relation to topics 2006-010A and 2007-101B for consultation.</p> <p><b>[31]</b>2015-07 Consultation for draft ISPMs</p> <p><b>[32]</b>2016-01 TPFQ inputs to the draft and steward</p> <p><b>[33]</b>2016-05 SC-7 asked the TPPT to better assess the treatments</p> <p><b>[34]</b>2017-05 SC-7 2017-07 Second consultation 2017-10 Steward revised the draft based on consultation comments 2017-11 SC revised in meeting and approved the draft for adoption by CPM</p>
<b>[35]Steward's history</b>	<p><b>[36]</b>2006-05 SC: Mr Greg WOLFF (CA, Lead Steward)</p> <p><b>[37]</b>2010-04 SC: Mr Thomas SCHRODER (DE, Lead Steward)</p> <p><b>[38]</b>2011-11 SC: Mr Piotr WLODARCZYK (PL, Lead Steward)</p> <p><b>[39]</b>2016-05 SC: Ms Marina ZLOTINA (US, Lead Steward)</p> <p><b>[40]</b>2016-05 SC: Mr Ezequiel FERRO (AR, Assistant steward)</p>

[41]Major stages for the revision of the dielectric heating section	[42]2014-10 TPFQ reviewed draft treatment for <i>Heat treatment of wood using dielectric heating</i> (2007-114) and suggested changes to the dielectric heating section of Annex 1 to ISPM 15
[43]Secretariat notes	<p>[44]2015-02 This document combines two topics:</p> <p>[45]Inclusion of the phytosanitary treatment Sulphuryl fluoride fumigation of wood packaging material in Annexes 1 and 2 to ISPM 15</p> <p>[46]Revision of dielectric heating section (Annex 1 (<i>Approved treatments associated with wood packaging material</i>) to ISPM 15 (<i>Regulation of wood packaging material in international trade</i>)) (2006-010B)</p> <p>[47]Grey text was not open for comments and was only changed for consistency with the revised text, indicated in black.</p> <p>Edited 2017-11</p> <p><i>The text will be formatted after adoption.</i></p>

[48]This revised Annex 1 was adopted by the XXth Session of the Commission on Phytosanitary Measures in [month] [year].

[49]The annex is a prescriptive part of the standard.

[50]ANNEX 1: Approved treatments associated with wood packaging material (2013)

[51]The approved treatments may be applied to units of wood packaging material or to pieces of wood that are to be made into wood packaging material.

[52]Use of debarked wood

[53]Irrespective of the type of treatment applied, wood packaging material must be made of debarked wood. For this standard, any number of visually separate and clearly distinct small pieces of bark may remain if they are:

[54]- less than 3 cm in width (regardless of the length) or

[55]- greater than 3 cm in width, with the total surface area of an individual piece of bark less than 50 square cm.

[56]For methyl bromide and sulphuryl fluoride treatments, the removal of bark must be carried out before treatment as the presence of bark on the wood may affect treatment efficacy. For heat treatment, the removal of bark may be carried out before or after treatment. When a dimension limitation is specified for a certain type of heat treatment (e.g. dielectric heating), any bark must be included in the dimension measurement.

[57]Heat treatment

[58]Various energy sources or processes may be suitable to achieve the required treatment parameters. For example, conventional steam heating, kiln-drying, heat-enabled chemical pressure impregnation and dielectric heating (microwave, radio frequency) may all be considered heat treatments provided they meet the heat treatment parameters specified in this standard.

[59]NPPOs should ensure that treatment providers monitor the treatment temperature at a location likely to be the coldest, which will be the location taking the longest time to reach the target temperature in the wood, to ensure that the target temperature is maintained for the duration of treatment throughout the batch of wood being treated. The point at which a piece of wood is the coldest may vary depending on the energy source or process applied, the moisture content and the initial temperature distribution in the wood.

[60]When using dielectric heating as a heat source, the coldest part of the wood during treatment is usually the surface. In some situations (e.g. dielectric heating of wood of large dimensions that has been frozen and until the wood has thawed) the core may be the coldest part of the wood.

[61]Heat treatment using a conventional steam or dry kiln heat chamber (treatment code for the mark: HT)

[62] When using conventional heat chamber technology, the fundamental requirement is to achieve a minimum temperature of 56 °C for a minimum duration of 30 continuous minutes throughout the entire profile of the wood (including its core).

[63] This temperature can be measured by inserting temperature sensors in the core of the wood. Alternatively, when using kiln-drying heat chambers or other heat treatment chambers, treatment schedules may be developed based on a series of test treatments during which the core temperature of the wood at various locations inside the heat chamber has been measured and correlated with chamber air temperature, taking into account the moisture content of the wood and other substantial parameters (such as species and thickness of the wood, air flow rate and humidity). The test series must demonstrate that a minimum temperature of 56 °C is maintained for a minimum duration of 30 continuous minutes throughout the entire profile of the wood.

[64] Treatment schedules should be specified or approved by the NPPO.

[65] Treatment providers should be approved by the NPPO. NPPOs should consider the following factors that may be required for a heat chamber to meet the treatment requirements:

[66]- The heat chamber is sealed and well insulated, including insulation in the floor.

[67]- The heat chamber is designed in a manner that permits uniform flow of air around and through the wood stack. Wood to be treated is loaded into the chamber in a manner that ensures adequate air flow around and through the wood stack.

[68]- Air deflectors in the chamber area and spacers in the stack of the wood are used as required to ensure adequate air flow.

[69]- Fans are used to circulate air during treatment, and air flow from these fans is sufficient to ensure the core temperature of the wood is maintained at the specified level for the required duration.

[70]- The coldest location within the chamber is identified for each load and temperature sensors are placed there, either in the wood or in the chamber.

[71]- Where the treatment is monitored using temperature sensors inserted into the wood, at least two temperature sensors are recommended. These temperature sensors should be suitable for measuring wood core temperature. The use of multiple temperature sensors ensures that any failure of a temperature sensor is detected during the treatment process. The temperature sensors are inserted at least 30 cm from the end of a piece of wood and penetrate to the centre of the wood. For shorter boards or pallet blocks, temperature sensors are also inserted in the piece of wood with the largest dimensions in a manner that ensures the temperature at the core is measured. Any holes drilled in the wood to place the temperature sensors are sealed with appropriate material to prevent interference in temperature measurement by convection or conduction. Special attention should be paid to external influences on the wood such as nails or metal insertions that may lead to incorrect measurements.

[72]- Where the treatment schedule is based on monitoring chamber air temperature and is used for treatment of different wood types (e.g. specific species and sizes), the schedule takes into account the species, moisture content and thickness of the wood being treated. At least two temperature sensors are recommended for monitoring the air temperature in the chamber treating wood packaging according to treatment schedules.

[73]- If the air flow in the chamber is routinely reversed during treatment, a greater number of temperature sensors may be needed to account for a possible change in the location of the coldest point.

[74]- Temperature sensors and data recording equipment are calibrated in accordance with the manufacturer's instructions at a frequency specified by the NPPO.

[75]- Temperatures are monitored and recorded during each treatment to ensure that the prescribed minimum temperature is maintained for the required period of time. If the minimum temperature is not maintained, corrective action needs to be taken to ensure that all wood is treated according to heat treatment requirements (30 continuous minutes at 56 °C); for example, the treatment is restarted or the treatment time extended and, if necessary, the temperature raised. During the treatment period, the frequency of temperature readings is sufficient to ensure that treatment failures can be detected.

[76]- For the purpose of auditing, the treatment provider keeps records of heat treatments and calibrations for a period of time specified by the NPPO.

**[77]Heat treatment using dielectric heating (treatment code for the mark: DH)**

[78]Where dielectric heating ~~is used (e.g. microwaves or radio waves) is used~~, wood packaging material ~~composed of wood not exceeding 20 cm<sup>1</sup> when measured across the smallest dimension of the piece or the stack~~ must be heated to achieve a minimum temperature of 60 °C for 1 continuous minute throughout the entire profile of the wood (including its surface). ~~The prescribed temperature must be reached within 30 minutes from the start of the treatment<sup>2</sup>. Treatment providers using dielectric heating must verify that their schedules achieve specified treatment parameters (taking into account the moisture content of the wood, its size and density, and the frequency of microwaves or radio waves).~~

[79]Treatment schedules should be specified or approved by the NPPO.

[80]Treatment providers should be approved by the NPPO. NPPOs should consider the following factors that may be required for a dielectric heating chamber to meet the treatment requirements:-

[81]- Irrespective of whether dielectric heating is conducted as a batch process or as a continuous (conveyor) process, the treatment is monitored in the wood where the temperature is likely to be the coldest (normally on the surface) to ensure the target temperature is maintained. For measuring the temperature, at least two temperature sensors are recommended to ensure that any failure of a temperature sensor is detected.

[82]- The treatment provider has initially validated that the wood temperatures reach or exceed 60 °C for 1 continuous minute throughout the entire profile of the wood (including its surface).

[83]- For wood exceeding 5 cm in thickness, dielectric heating at 2.45 GHz requires bidirectional application or multiple waveguides for the delivery of microwave energy to ensure uniformity of heating.

[84]- Temperature sensors and data recording equipment are calibrated in accordance with the manufacturer's instructions at a frequency specified by the NPPO.

[85]- For the purpose of auditing, the treatment provider keeps records of heat treatments and calibrations for a period of time specified by the NPPO.

**[86]Methyl bromide treatment (treatment code for the mark: MB)**

[87]NPPOs are encouraged to promote the use of alternative treatments approved in this standard<sup>13</sup>. Use of methyl bromide should take into account the CPM recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM, 2008).

[88]Wood packaging material containing a piece of wood exceeding 20 cm in cross-section at its smallest dimension must not be treated with methyl bromide.

[89]The fumigation of wood packaging material with methyl bromide must be in accordance with a schedule specified or approved by the NPPO that achieves the minimum concentration-time product<sup>24</sup> (CT) over 24 hours at the temperature and final residual concentration specified in Table 1. This CT must be achieved throughout the profile of the wood, including its core, although the concentration ~~s would be~~ is measured in the ambient atmosphere. The minimum temperature of the wood and its surrounding atmosphere must not be less than 10 °C and the minimum exposure time must not be less than 24 hours. Monitoring of gas concentrations must be carried out at a minimum at 2, 4 and 24 hours from the beginning of the treatment. In the case of longer exposure times and weaker concentrations, additional measurement of the gas concentrations should be recorded at the end of fumigation.

[90]If the CT is not achieved over 24 hours, corrective action needs to be taken to ensure the CT is reached; for example, the treatment is restarted or the treatment time extended for a maximum of two hours without adding more methyl bromide to achieve the required CT (see the footnote to Table 1).

<sup>1</sup> Contracting parties to the IPPC may also have obligations under the Montreal Protocol on Substances that Deplete the Ozone Layer (UNEP, 2000).

<sup>2</sup> The CT utilized for methyl bromide and sulphuryl fluoride treatments in this standard is the sum of the products of the concentration (g/m<sup>3</sup>) and time (h) over the duration of the treatment.

**[91]Table 1.** Minimum required CT over 24 hours for wood packaging material fumigated with methyl bromide

[92]Temperature (°C)	[93]Minimum required CT (g·h/m <sup>3</sup> ) over 24 h	[94]Minimum final concentration (g/m <sup>3</sup> ) after 24 h <sup>#</sup>
[95]21.0 or above	[96]650	[97]24
[98]16.0 – 20.9	[99]800	[100]28
[101]10.0 – 15.9	[102]900	[103]32

[104]# In circumstances when the minimum final concentration is not achieved after 24 hours, a deviation in the concentration of ~5% is permitted provided additional treatment time is added to the end of the treatment to achieve the prescribed CT.

[105]One example of a schedule that may be used for achieving the specified requirements is shown in Table 2.

**[106]Table 2.** Example of a treatment schedule that achieves the minimum required CT for wood packaging material treated with methyl bromide (initial doses may need to be higher in conditions of high sorption or leakage)

[107]Temperature (°C)	[108]Dosage (g/m <sup>3</sup> )	[109]Minimum concentration (g/m <sup>3</sup> ) at:		
		[112]2 h	[113]4 h	[114]24 h
[115]21.0 or above	[116]48	[117]36	[118]31	[119]24
[120]16.0 – 20.9	[121]56	[122]42	[123]36	[124]28
[125]10.0 – 15.9	[126]64	[127]48	[128]42	[129]32

[130]Treatment providers should be approved by the NPPO. NPPOs should consider the following factors that may be required for methyl bromide fumigation to meet the treatment requirements:-

[131]- Fans are used as appropriate during the gas distribution phase of fumigation to ensure equilibrium is reached, and they are positioned to make certain the fumigant is rapidly and effectively distributed throughout the fumigation enclosure (preferably within the first hour of application).

[132]- The fumigation enclosure is not loaded beyond 80% of its volume.

[133]- The fumigation enclosure is well sealed and as gas tight as possible. If fumigation is to be carried out under sheets, these are made of gas-proof material and sealed appropriately at the seams and at floor level.

[134]- The fumigation site floor is impermeable to the fumigant; if it is not, gas-proof sheets are laid on the floor.

[135]- The use of a vaporizer to apply methyl bromide (“hot gassing”) in order to fully volatilize the fumigant prior to its entry into the fumigation enclosure is recommended.

[136]- Methyl bromide treatment is not carried out on stacked wood packaging material exceeding 20 cm in cross-section at its smallest dimension. Therefore, stacked wood packaging material may need separators to ensure adequate methyl bromide circulation and penetration.

[137]- The concentration of methyl bromide in the air space is always measured at a location furthest from the insertion point of the gas as well as at other locations throughout the enclosure (e.g. at front bottom, centre middle and back top) to confirm that uniform distribution of the gas is reached. Treatment time is not calculated until uniform distribution has been reached.

[138]- When calculating methyl bromide dosage, compensation is made for any gas mixtures (e.g. 2% chloropicrin) to ensure that the total amount of methyl bromide applied meets required dose rates.

[139]- Initial dose rates and post-treatment product handling procedures take account of likely methyl bromide sorption by the treated wood packaging material or associated product (e.g. polystyrene boxes).

[140]- The measured or expected temperature of the product or the ambient air immediately before or during treatment (whichever is the lowest) is used to calculate the methyl bromide dose.

[141]- Wood packaging material to be fumigated is not wrapped or coated in materials impervious to the fumigant.

[142]- Temperature and gas concentration sensors and data recording equipment are calibrated in accordance with the manufacturer's instructions at a frequency specified by the NPPO.

[143]- For the purposes of auditing, the treatment provider keeps records of methyl bromide treatments and calibrations for a period of time specified by the NPPO.

**[144] Sulphuryl fluoride treatment (treatment code for the mark: SF)**

[145] Wood packaging material containing a piece of wood exceeding 20 cm in cross-section at its smallest dimension must not be treated with sulphuryl fluoride. Wood packaging material with a moisture content higher than 75% (dry basis) must not be treated with sulphuryl fluoride.

[146] The fumigation of wood packaging material with sulphuryl fluoride must be in accordance with a schedule specified or approved by the NPPO that achieves the minimum CT<sup>2</sup> over 24 or 48 hours at the target temperature and final residual concentration specified in Table 3. This CT must be achieved throughout the profile of the wood, including its core, although the concentration is measured in the ambient atmosphere. Small increases in the treatment time (not more than two hours) may be permitted to achieve the required CT if the minimum final concentration is not reached. The minimum temperature of the wood must not be lower than 20 °C and the minimum exposure time must not be less than the time stated for each temperature in Table 3. Monitoring of gas concentration must be carried out at a minimum of 2, 4, 24 and, when appropriate, 48 hours from the beginning of the treatment. In the case of longer exposure times and weaker concentrations, additional measurements of the gas concentrations should be recorded at the end of fumigation.

[147] If the CT is not achieved within a single 24 or 48 hour period (even if the minimum final concentration is achieved), corrective action should be taken. The treatment time may be extended for a maximum of two hours without adding more sulphuryl fluoride, or it may be restarted.

[148] Table 3. Minimum required CT over 24 or 48 hours for wood packaging material fumigated with sulphuryl fluoride

[149] Temperature (°C)	[150] Minimum required CT (g·h/m <sup>3</sup> )	[151] Minimum final concentration (g/m <sup>3</sup> ) <sup>†</sup>
[152] 30 or above for 24 h	[153] 1 400	[154] 41
[155] 20 or above for 48 h	[156] 3 000	[157] 29

[158]

[159]<sup>†</sup> If the minimum final concentration is not achieved after 24 or 48 hours by the end of the treatment, a deviation in the concentration of ~5% is permitted, provided additional treatment time is added at the end of the treatment to achieve the prescribed CT.

[160] One example of a schedule that may be used for achieving the specified requirements is shown in Table 4.

[161] Table 4. Example of a treatment schedule that achieves the minimum required CT for wood packaging material treated with sulphuryl fluoride (initial dosage may need to be higher in conditions of high sorption or leakage)

			[165] Minimum concentration (g/m <sup>3</sup> ) at:
--	--	--	---

[162]Temperature (°C)	[163]Minimum required CT (g·h/m <sup>3</sup> )	[164]Dosage (g/m <sup>3</sup> )	[169]0.5 h	[170]2 h	[171]4 h	[172]12 h	[173]24 h	[174]36 h	[175]48 h
[176]30 or above	[177]1 400	[178]82	[179]87	[180]78	[181]73	[182]58	[183]41	[184]n/a <sup>†</sup>	[185]n/a <sup>†</sup>
[186]20 or above	[187]3 000	[188]120	[189]124	[190]112	[191]104	[192]82	[193]58	[194]41	[195]29

[196]<sup>†</sup> n/a. Not applicable.

[197]Treatment providers should be approved by the NPPO. NPPOs should consider the following factors that may be required for sulphuryl fluoride fumigation to meet the treatment requirements.

- [198]Fans are used as appropriate during the gas distribution phase of fumigation to ensure equilibrium is reached, and they are positioned to make certain that the fumigant is rapidly and effectively distributed throughout the fumigation enclosure (preferably within the first hour of application).
- [199]The fumigation enclosure is not loaded beyond 80% of its volume.
- [200]The fumigation enclosure is well sealed and as gas tight as possible. If fumigation is to be carried out under sheets, these must be made of gas-proof material and sealed appropriately at the seams and at floor level.
- [201]The fumigation site floor is either impermeable to the fumigant or gas-proof sheets are laid on the floor.
- [202]Wood stacks need separators at least every 20 cm to ensure adequate sulphuryl fluoride circulation and penetration.
- [203]When calculating sulphuryl fluoride dosage, compensation is made for any gas mixtures (e.g. carbon dioxide) to ensure that the total amount of pure fumigant applied meets the requirements prescribed in the standard.
- [204]The concentration of sulphuryl fluoride in the air space is always measured at a location furthest from the insertion point of the gas as well as at other locations throughout the enclosure (e.g. at front bottom, centre middle and back top) to confirm that uniform distribution of the gas is reached. Treatment time is not calculated until uniform distribution has been reached.
- [205]Initial dosage and post-treatment product handling procedures take into account likely sulphuryl fluoride sorption by the treated wood packaging material or associated product.
- [206]The measured temperature of the product or the ambient air (whichever is lower) is used to calculate the sulphuryl fluoride dosage, and the temperature of the product must be at least 20 °C (including at the wood core) throughout the duration of the treatment.
- [207]Wood packaging material to be fumigated is not wrapped or coated in materials impervious to the fumigant.
- [208]Temperature and gas concentration sensors and data recording equipment are calibrated in accordance with the manufacturer's instructions at a frequency specified by the NPPO. Instruments used for measuring the concentration of sulphuryl fluoride may be affected by altitude, water vapour, carbon dioxide or temperature. These instruments need to be calibrated specifically for sulphuryl fluoride.

- [\[209\]](#)For the purpose of auditing, the treatment provider keeps records of sulphuryl fluoride treatments and calibrations for a period of time specified by the NPPO.
- [\[210\]](#)Personnel applying fumigation treatment should follow the label requirements for use of sulphuryl fluoride.

[\[211\]](#)**Adoption of alternative treatments and revisions of approved treatment schedules**

[\[212\]](#)As new technical information becomes available, existing treatments may be reviewed and modified, and alternative treatments or **a** new treatment schedule for wood packaging material may be adopted by the CPM. If a new treatment or a revised treatment schedule is adopted for wood packaging material and incorporated into this ISPM, material treated under the previous treatment and/or schedule does not need to be re-treated or re-marked.



This revised Annex 2 was adopted by the XXth Session of the Commission on Phytosanitary Measures in [month] [year].

**[213] ANNEX 2: The mark and its application**

The annex is a prescriptive part of the standard.

[214] A mark indicating that wood packaging material has been subjected to approved phytosanitary treatment in accordance with this standard<sup>35</sup> comprises the following required components:

[215]- the symbol

[216]- a country code

[217]- a producer/treatment provider code

[218]- a treatment code using the appropriate abbreviation according to Annex 1 (HT, DH, MB or SF).

**[219] Symbol**

[220] The design of the symbol (which may have been registered under national, regional or international procedures, as either a trademark or a certification/collective/guarantee mark) must resemble closely that shown in the examples illustrated below and must be presented to the left of the other components.

**[221] Country code**

[222] The country code must be the International Organization for Standards (ISO) two-letter country code (shown in the examples as "XX"). It must be separated by a hyphen from the producer/treatment provider code.

**[223] Producer/treatment provider code**

[224] The producer/treatment provider code is a unique code assigned by the NPPO to the producer of the wood packaging material or treatment provider who applies the marks or the entity otherwise responsible to the NPPO for ensuring that appropriately treated wood is used and properly marked (shown in the examples as "000"). The number and order of digits and/or letters are assigned by the NPPO.

**[225] Treatment code**

[226] The treatment code is an IPPC abbreviation as provided in Annex 1 for the approved measure used and shown in the examples as "YY". The treatment code must appear after the combined country and producer/treatment provider codes. It must appear on a separate line from the country code and producer/treatment provider code, or be separated by a hyphen if presented on the same line as the other codes.

[227] Treatment code	[228] Treatment type
[229] HT	[230] Heat treatment
[231] DH	[232] Dielectric heating
[233] MB	[234] Methyl bromide
[235] SF	[236] Sulphuryl fluoride

<sup>3</sup> At import, countries should accept previously produced wood packaging material carrying a mark consistent with earlier versions of this standard.

**[237]Application of the mark**

[238]The size, font types used, and position of the mark may vary, but its size must be sufficient to be both visible and legible to inspectors without the use of a visual aid. The mark must be rectangular or square in shape and contained within a border line with a vertical line separating the symbol from the code components. To facilitate the use of stencilling, small gaps in the border, the vertical line, and elsewhere among the components of the mark, may be present.

[239]No other information shall be contained within the border of the mark. If additional marks (e.g. trademarks of the producer, logo of the authorizing body) are considered useful to protect the use of the mark on a national level, such information may be provided adjacent to but outside of the border of the mark.

[240]The mark must be:

[241]- legible

[242]- durable and not transferable

[243]- placed in a location that is visible when the wood packaging is in use, preferably on at least two opposite sides of the wood packaging unit.

[244]The mark must not be hand drawn.

[245]The use of red or orange should be avoided because these colours are used in the labelling of dangerous goods.

[246]Where various components are integrated into a unit of wood packaging material, the resultant composite unit should be considered as a single unit for marking purposes. On a composite unit of wood packaging material made of both treated wood and processed wood material (where the processed component does not require treatment), it may be appropriate for the mark to appear on the processed wood material components to ensure that the mark is in a visible location and is of a sufficient size. This approach to the application of the mark applies only to composite single units, not to temporary assemblies of wood packaging material.

[247]Special consideration of legible application of the mark to dunnage may be necessary because treated wood for use as dunnage may not be cut to final length until loading of a conveyance takes place. It is important that shippers ensure that all dunnage used to secure or support commodities is treated and displays the mark described in this annex, and that the marks are clear and legible. Small pieces of wood that do not include all the required elements of the mark should not be used for dunnage. Options for marking dunnage appropriately include:

[248]- application of the mark to pieces of wood intended for use as dunnage along their entire length at very short intervals (NB: where very small pieces are subsequently cut for use as dunnage, the cuts should be made so that an entire mark is present on the dunnage used.)

[249]- additional application of the mark to treated dunnage in a visible location after cutting, provided that the shipper is authorized in accordance with section 4.

[250]The examples below illustrate some acceptable variants of the required components of the mark that is used to certify that the wood packaging material that bears such a mark has been subjected to an approved treatment. No variations in the symbol should be accepted. Variations in the layout of the mark should be accepted provided that they meet the requirements set out in this annex.