THAI AGRICULTURAL STANDARD

TAS 9535 – 2004

REQUIREMENTS FOR EXPORTED WOOD PACKAGING MATERIALS

National Bureau of Agricultural Commodity and Food Standards

Ministry of Agriculture and Cooperatives

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Thailand uses packaging material to protect and support the exported goods from damages, as well as to facilitate transportation. Most packaging materials are produced from local woods as they are strong and available at reasonable prices. In order to provide member countries with guidelines to control the spread of plant pests associated with wood packaging materials, the Food and Agriculture Organisation issued the International Standards for Phytosanitary Measures No.15.

To ensure that exported goods associated with wood packaging materials are not quarantined by importing countries, it is therefore necessary for the Thai Ministry of Agriculture and Cooperatives to establish the requirements for wood packaging materials used in export which will become the central standard for producers of wood packaging materials and for the product quality certification body.

The provisions of this standard are based upon the following source materials:

Department of Agriculture. 2000 Manual and Procedures for Agricultural Commodity Export Services, Ministry of Agriculture and Cooperatives.

Department of Agriculture. 2002 Fumigation Techniques for Agricultural Products Insect Pest Control, Ministry of Agriculture and Cooperatives.

The Office of Industrial Products Standards. 1997 TACFS 5065 – 1997: General Guidelines for Product Quality Certification Body: ISO / IEC GUIDE 65: 1996. Ministry of Industry.

FAO/IPPC. 2002: International Standards for Phytosanitary Measures No. 15: Guidelines for Regulating Wood Packaging Materials in International Trade.

Prat. GH., 1974: Timber Drying Manual. Her Majesty's Stationery Office, London.

Stevens, W.C. and G.H. Pratt., 1961: Kiln Operator's Handbook. A Guide to the Kiln Drying of Timber. Her Majesty's Stationery Office, London.

Remark:
The standard title has been revised from "Thai Agricultural Commodity and Food Standard (TACFS)" to "Thai Agricultural Standard (TAS)" in accordance with the application of the Agricultural Standard Act B.E. 2551 (2008)

NOTIFICATION OF THE NATIONAL COMMITTEE ON AGRICULTURAL COMMODITY AND FOOD STANDARDS SUBJECT: THAI AGRICULTURAL COMMODITY AND FOOD STANDARD REQUIREMENTS FOR EXPORTED WOOD PACKAGING MATERIALS B.E. 2547 (2004)

By virtue of the Cabinet Resolution on Appointment and Authorization of the National Committee on Agricultural Commodity and Food Standards, the Notification on Thai Agricultural Commodity and Food Standard entitled Requirements for Exported Wood Packaging Materials is hereby issued as voluntary standard, the details of which are attached herewith.

Notified on the 25 March B.E. 2547 (2004)

Mr. Somsak Tepsuthin
Minister of Agriculture and Cooperatives
Chairperson of the National Committee
on Agricultural Commodity and Food Standards

THAI AGRICULTURAL STANDARD

REQUIREMENTS FOR EXPORTED WOOD PACKAGING MATERIALS

1 SCOPE

This Thai Agricultural Commodity and Food Standard describes phytosanitary measures to control and eradicate the spread of plant pests associated with wood packaging materials in use in international trade as well as the practical guidelines to acquire official certificate and/or to obtain official certification stamps regarding wood packaging materials.

2 DEFINITIONS

The terminology used in this Thai Agricultural Commodity and Food Standard is defined as follows:

2.1 ISPM NO.15 is the International Standard for Phytosanitary Measures No.15 for Regulating Wood Packaging Materials in International Trade.

2.2 PROCESSED WOOD refers to the wood that has undergone processing or treatment using gum, heat, pressure or a combination thereof.

2.3 RAW WOOD refers to that which has not undergone wood protection process or treatment.

2.4 WOOD PACKAGING MATERIAL is the material or a wooden part of material (excluding paper product) used as package or equipment part used in the export of goods.

2.5 CERTIFICATION BODY (CB) is the agency officially recognized by the National Bureau of Agricultural Commodity and Food Standards for this specific standard and is approved by the National Bureau of Agricultural Commodity and Food Standards

3 GENERAL GUIDELINES

3.1 WOOD PACKAGING MATERIALS

3.1.1 Wood packaging materials covered under this standard are those made from raw wood and recyclable wood packaging material such as crating, packing block, drums, pallet, dunnage, case, pallet collars, skids and load boards.

3.1.2 This standard does not cover wood packaging materials made from processed wood or raw wood of not more than 6 millimetre in thickness or wood by-products such as veneer peeler cores, sawdust, wood wool and shaving as these materials offer less chance for insects and pests to enter the importing countries.

3.2 PLANT PESTS ASSOCIATED WITH WOOD PACKAGING MATERIALS
The International Standards for Phytosanitary Measures No.15 provides a list of important plant insect pests associated with wood packaging materials which can be controlled by the certified methods (Annex 1).

4 MEASURES FOR WOOD PACKAGING MATERIALS

4.1 CERTIFIED MEASURES

Any of the treatments or processes described in the International Standards for Phytosanitary Measures No. 15 can be applied for the control of plant insect pest control in wood packaging materials as follows:

4.1.1 Heat Treatment

Raw material to be used as wood packaging material should be heated until the wood core achieves a minimum temperature of 56º Celsius for a minimum of 30 minutes. If the Kiln-drying (KD), or the Chemical Pressure Impregnation (CPI), or any other treatment is considered, the wood core must be heated to a minimum temperature of 56º Celsius for a minimum of 30 minutes in order to meet the heat treatment specifications.

4.1.2 Methyl Bromide Fumigation

The wood packaging material should be fumigated with methyl bromide at the temperature, dosage, timing and concentration as indicated in Table 1.

Table 1 Temperature, Dosage, Timing and Methyl bromide Concentration

Temperature	Dosage (g/m^3)	Minimum Concentration (g/m^3) at:			
		½ hr.	2 hrs.	4 hrs.	16 hrs.
21º C or above	48	36	24	17	14
16º C or above	56	42	28	20	17
11º C or above	64	48	32	22	19

The minimum temperature should not be less than 10º C and the minimum exposure time should not be less than 16 hours.

4.2 OTHER MEASURES

Other treatments set in the International Standards for Phytosanitary Measures No.15 may be applied if they are technically justified in controlling plant insect pests associated with wood packaging materials, as follows:

4.2.1 Fumigation treatment with phosphine, sulfuryl fluoride, and carboryl sulphide.

4.2.2 Chemical Pressure Impregnation using different process such as high-pressure / vacuum process, double vacuum process, hot and cold open tank process, and sap displacement method.

4.2.3 Irradiation using gamma radiation, X-rays, Microwave, Infra red, and Electron beam treatment.

4.2.4 Controlled atmosphere

5 REGULATORY REQUIREMENTS FOR PRODUCERS OF WOOD PACKAGING MATERIALS

Wood packaging material producers wanting to obtain a certification on the wood packaging materials and a certified mark (Annex 2) under this standard must carry out the following:

5.1 Submit a request to become a registered wood packaging material producer with the official product certification body.

5.2 Assign operators for 4.1 and 4.2 above with one of the following qualifications:

5.2.1 Be capable of and have been trained on heat treatment from a government body or an officially certified private sector.

5.2.2 Be capable of and have been trained on methyl bromide fumigation from a government body or an officially certified private sector.

5.2.3 Be capable of and have been trained on fumigation, chemical impregnation, irradiation, and controlled atmosphere from a government body or an officially certified private sector.

5.3 If the treatment outlined in 4.1.2 is applied, a notification of possession of hazardous substances is required as per the Hazardous Substance Act 1992 (B.E. 2535).

5.4 Produce an operating manual and record operating data during the operations as well as the steps taken for the control of plant insect pests in wood packaging materials.

5.5 Allocate sufficient space within the warehouse to separately store wood packaging materials successfully treated with 4.1 or 4.2 from those not treated with 4.1 or 4.2.

6 REQUIREMENTS FOR OBTAINING A CERTIFICATE AND A CERTIFIED MARK

6.1 Producers of wood packaging materials wanting to obtain a certificate and/or certified marks to demonstrate to the imported countries that the wood packaging materials used in goods transportation have undergone treatments described in 4.1 can submit their request through a certified product quality certification unit.

6.2 Producers of wood packaging materials applying treatments described in 4.2 can only use certified marks only when the International Standards for Phytosanitary Measures No.15 allows such certification in the particular cases.

ANNEX 1

LIST OF SIGNIFICANT PLANT INSECT PESTS ASSOCIATED WITH WOOD PACKAGING MATERIALS CONTROLLABLE BY THE CERTIFIED TREATMENTS

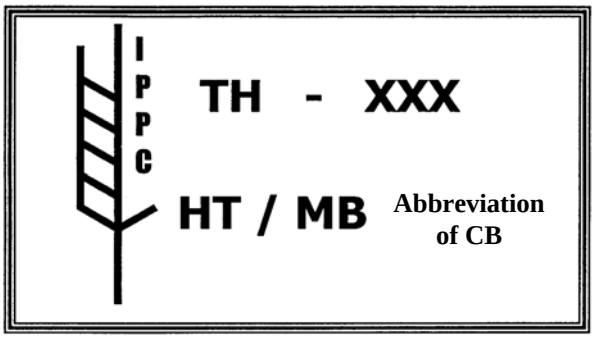
Insect of the following families:

- Anobiidae, such as tobacco weevil, etc.
- Bostrichidae, such as lesser grain borrer, etc.
- Buprestidae, such as buprestis beetle, wood borer, etc.
- Cerambycidae, such as stem-boring grub (beetle), etc.
- Curculionidae, such as snout beetle, etc.
- Isoptera, such as termite, etc.
- Lyctidae, such as power post beetle, etc.
- Oedemeridae, such as wharf borer, etc.
- Scolytidae, such as wood borer, etc.
- Siricidae, such as horntails, etc.

Nematode species *Bursaphelenchus xylophilus*

ANNEX 2

MARKING FOR CERTIFIED WOOD PACKAGING MATERIALS



IPPC	means	Internationally recognised symbol based on ISPM 15
TH	means	Thailand
xxx	means	Registered number of the wood packaging material producer
HT	means	Heat treatment
MB	means	Methyl bromide treatment
CB	means	Certification body for product quality

Markings should be:

1. Must be clear
2. Permanently placed on the article being certified
3. Placed in a visible location, preferably on at least two opposite sides of the article being certified
4. The use of red and orange must be avoided. Dark colours should be used.

GUIDELINES ON HEAT TREATMENT FOR WOOD PACKAGING MATERIALS

1 WOOD PREPARATION

Wood should be cut into pieces and should not be stored for more than 3 days to prevent fungal and insect damage. The wood should be arranged for heat treatment.

2 WOOD PACKAGING MATERIAL HEATH TREATMENT

2.1 Hot steam system

Required equipment

2.1.1 Incinerator

2.1.2 Energy source

2.1.3 Steam producing drum

2.1.4 Wood steam compartment

2.1.5 Steel pipe carrying hot steam to treatment chamber

2.1.6 Fan

2.1.7 Steam controlling valve

2.1.8 Wet and dry bulbs

2.1.9 Thermometer

2.2 Solar Energy System

Required equipment

2.3 Solar incinerator

3 WOOD HEAT TREATMENT PROCESS

Prior to the treatment, all equipment must be inspected to ensure their ‘ready-to-use’ condition.

3.1 Wood Heat Treatment Procedure

3.2 Wood should be placed in the steam compartment in a pattern that allows heat to penetrate through the lower parts.

3.3 The steam compartment must be completely sealed to prevent heat from escaping in order to maintain a required temperature.

3.4 Maintain heat in the incinerator at the temperature and timing set in this standard.

4 WOOD HEAT TREATMENT TIMING

Wood of different thickness contains different levels of moisture content and thus requires different heating timing. This is to ensure that heat can penetrate through the wood evenly.

Wood of 1 inch thick	at least 3 hours
Wood of 2 inches thick	at least 5 hours
Wood of 3 inches thick	at least 7 hours

The wood of three sizes undergoing heat treatment should not contain more than 15% - 20% moisture content and the temperature on dry and wet bulbs should be 60º Celsius and 56º Celsius respectively.

***Remark*:** The above timing already indicates an extended period to ensure that each piece of wood, no matter their position in the compartment, receives heat evenly especially the hard-to-reach and the wood core. However, heat treatment under this set condition will not prevent insect pests to cause damage after the treatment, but will kill wood borers, eggs and insect larva present in the wood while being treated.

5 HEAT TREATMENT COMPLETION

Upon reaching the pre-set timing, turn off the fan to allow the temperature in the compartment to cool down and reaches a room temperature before removing the treated wood.

GUIDELINES ON METHYL BROMIDE TREATMENT FOR WOOD PACKAGING MATERIALS

Methyl bromide is commercially known as 'bromomethene'. It is a colourless, odourless and non-flammable gas. Methyl bromide exists in a form of liquid if stored under low temperature and pressure. It is presently commercially available in two formula, i.e. purified methyl bromide 99.9% and methyl bromide 98% (mixed with Chloropicrin, which is a tear gas 2%). Methyl bromide has TLV-TWA (Threshold Limit Value – Time Weight Average) of 5 ppm.[1]

1 METHYL BROMIDE HEAT TREATMENT ON WOOD PACKAGING MATERIALS

Required equipment

1.1 Tarpaulin sheet
1.2 Sand snake or water snake
1.3 Methyl bromide
1.4 Measurement tape
1.5 Calculator
1.6 Gloves
1.7 Methyl bromide releasing device
1.7.1 Methyl bromide tube
1.7.2 Dispenser
1.7.3 Scale
1.7.4 Joints connecting gas tank and methyl bromide tube
1.8 Gas suction tube, for gas intensity measurement
1.9 Gas intensity gauge, such as Fumiscope, Riken, Detector tube
1.10 Gas leak detector, such as Halide Detector Lamp, Gas Leak Detector
1.11 Gas mask and canister, Self-contained breathing apparatus; SCBA
1.12 Vaporizer
1.13 Fan
1.14 2-inch wide sticky tape to seal leaking holes
1.15 Torch lamp
1.16 Tool box which includes screwdriver, pliers, spanner, tying belts.
1.17 Rope and warning signs

2 PRE TREATMENT PREPARATION

2.1 Inspect carefully the location and position of the wood packaging materials to be fumigated. The concrete floor must be free from cracks or leaks, and if cracks are found thick tarpaulin sheet must be laid first before piling the materials. The wood should be placed at about 1 meter away from each side of the walls, or from another wood pile to allow easy access of the operator.

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[1] TLV-TWA (Threshold Limit Value – Time Weight Average) 5 ppm. means the gas intensity average set as a safe standard for operators who work 8 hours per day, 5 days a week without causing any harm to health.

2.2 Inspect the tarpaulin sheet before covering the wood pile to ensure that there is no hole or tear, and if any holes are found it should be fixed.

2.3 Materials and equipment listed in section 1. should be adequate for each batch of fumigation.

3 FUMIGATION PROCESS

3.1 Place the methyl bromide releasing tube under the pile of material, by releasing about 1 meter from the floor. Position the fan at the end of the tube to ensure even gas current within the compartment.

3.2 Place gas suction tubes for gas intensity measurements at 3 positions (top, middle and bottom parts of the pile). Position these tubes in a diagonally opposite position.

3.3 Place material like hemp sack on corners of the material piles to prevent the tarpaulin sheet from being torn.

3.4 Cover the wood packaging material pile with tarpaulin sheet, with at least 50 centimeters of each end of the sheet to cover the floor.

3.5 Arrange the tarpaulin sheet neatly and correctly especially on corners, and place two rows of sand snakes around the pile.

3.6 Measure the size of the wood packaging material pile (width x length x height) in order to calculate the quantity of fumigant to be used.

3.7 Turn on the ventilator

3.8 Place the rope around and put on warning signs around the fumigation areas.

3.9 Release methyl bromide through vaporizer as per calculated quantity.

3.10 Inspect carefully the gas leak using gas leak detector at the sheet ends and repaired spots.

3.11 Measure the gas intensity using gas intensity gauge described in section 4.

3.12 Allow the fumigation to continue for at least 16 hours

3.13 Upon completion, remove the tarpaulin sheet and turn on the ventilator to blow out the gas from the wood packaging materials.

3.14 Measure the gas intensity around the pile using a detector tube and the operator is allowed in only if the intensity is not more than 5 ppm.

4 THE INTENSITY OF METHYL BROMIDE DURING FUMIGATION

While the fumigation treatment is in progress, the intensity of Methyl Bromide in the pile of wood packaging materials must be measured using the gas intensity gauge after the gas is released for ½ hour, 2 hours, 4 hours and 16 hours. Table 1 below provides indicative gas intensity against timings:

Table 1: Acceptable Minimum Methyl Bromide Gas Intensity (g/m^3) after released

Temperature	Dosage (g/m^3)	Minimum Concentration (g/m^3) at:			
		½ hr.	2 hrs.	4 hrs.	16 hrs.
21º C or above	48	36	24	17	14
16º C or above	56	42	28	20	17
11º C or above	64	48	32	22	19

The minimum temperature should not be less than 10º C and the minimum exposure time should not be less than 16 hours.

5 FUMIGATION TREATMENT COMPLETION

Upon reaching the pre-set fumigation timing, the operator must take the following steps:

5.1 Put on a gas mask and a canister.

5.2 Remove sand snake away from the tarpaulin sheet.

5.3 Remove the tarpaulin sheet away from the fumigated wood packaging material.

5.4 Allow the gas to evaporate from the material pile using a fan.

5.5 Measure the gas intensity around the material pile using a detector tube and the operator is allowed in only if the intensity is not more than 5 ppm.

6 SAFETY GUIDELINES

6.1 Check gas leak every time the fumigation is performed using Halide detector lamp or gas leak detector.

6.1.1 Take precaution when using detector lamp as a gas measuring device

6.1.1.1 Never use detector lamp with phosphine, ethelyneoxide, carbonsulphide, and methylchloride as it may cause fire or explosion.

6.1.1.2 Never use detector lamp in the area where petroleum or any flammable materials exist.

6.1.1.3 Flame from the lamp may cause fire on tarpaulin sheet.

6.1.1.4 Never use the device to measure the intensity of methyl bromide while fumigation is in progress.

6.2 Always wear a gas mask and a canister while operating steps 3.9 to 3.10 and 3.13 to 3.14.

6.3 At least work with one assistant.

7 HARMS CAUSED BY METHYL BROMIDE

Methyl bromide can enter human body through -- eye, skin, and respiratory system. Contamination from methyl bromide may cause two symptoms:

7.1 Acute effect: Occurs immediately in coming in contact with the gas where symptoms may appear between 30 minutes to 2 days.

7.1.1 Eye contact: eyes become red, painful, blurred vision and irritate

7.1.2 Skin contact: the skin becomes painful, red and sometimes swollen, and severely irritated.

7.1.3 Respiratory system: headache, groggy, vomiting, confused, disoriented, stumbling and unconscious. If a high concentration is received, this may cause death.

7.2 Long term effects: may cause damage to the nervous system, such as the loss of memory, dizzy, dysfunctional nervous system, and weak muscles.