

National Standard

Guidelines for Certification of Forced Hot-Air Treatment Facilities for Wood Packaging Material



Government of India
Ministry of Agriculture
Department of Agriculture & Cooperation
Directorate of Plant Protection, Quarantine & Storage
N.H-IV Faridabad-121001

August 2004

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Endorsement:

This standard entitled '**Guidelines for Certification of Forced Hot Air Treatment Facilities for Wood Packaging Material**' has been developed by the Directorate of Plant Protection, Quarantine & Storage (Dte of PPQ&S), Faridabad-121001 for undertaking certification and approval of forced hot-air treatment facilities for treating wood packaging material in line with ISPM-15.

This standard was approved for adoption on 1st August 2004 by

(P.S. Chandurkar)
Plant Protection Adviser
Dte of PPQ&S
Faridabad-121001.

Review & Amendment

This standard is subject to periodic review by the Plant Protection Adviser and would be updated and revised as and when necessary. The standard holders should ensure that the current edition of the standard being used.

Control & Distribution of the standard

The controlled copy of this standard would be available with JD (PQ) and the officers of Plant Quarantine Stations listed below. PPA would hold the master copy of the standard. Any enquiries regarding this standard should be made to the PPA, Dte of PPQS, Faridabad-121001.

Controlled Copy Holder	Copy No.
JD (PQ), Dte of Plant Protection, Quarantine & Storage, N.H.IV., Faridabad-121001	1
PQ Division, Dte of Plant Protection, Quarantine & Storage, N.H.IV., Faridabad	2
Dy Director (PP/Ent), In-charge of National Plant Quarantine Station, Rangapuri, New Delhi-110037	3/4
Dy Director (Ent.), In-charge of Regional Plant Quarantine Station, Amritsar	5
Dy. Director (Ent./PP), In-charge of Regional Plant Quarantine Station, Kolkata	6
Dy. Director (Ent/PP), In-charge of Regional Plant Quarantine Station, Chennai	7/8
Dy Director (PP/Ent.), In-charge of Regional Plant Quarantine Station, Mumbai	9

Introduction

Scope

This standard provides guidance for certifying forced hot-air treatment facilities for treating of solid wood packaging material to meet the requirements of ISPM-15.

References

- International Plant Protection Convention, 1997, FAO, Rome.
- Guidelines for Regulating Wood Packaging Material in International Trade, 2002, ISPM-15, FAO, Rome.
- Export Certification System, 1997, ISPM-7, FAO, Rome.
- ISO 3166-1-ALPHA-2-CODE ELEMENTS
(http://www.din.de/gremien/nas/nabd/iso3166ma/codlstp1/en_listpl.html)
- Guidelines for Regulating Export of Solid Wood Packaging Material, 2004, Dte of PPQS, Ministry of Agriculture, Government of India.
- PPQ Treatment Manual, 2002, USDA, APHIS, USA.

Definitions & Terms:

Certificate:	An official document which attests to the phytosanitary status of any consignment affected by phytosanitary regulations [FAO, 1990]
Dunnage:	Wood packaging material used to secure or support a commodity but which does not remain associated with the commodity [FAO, 1990; revised ISPM Pub. No. 15, 2002]
Dwell-time	The time of holding of treatment after it attains the specified temperature of the treatment
Heat treatment	The process in which a commodity is heated until it reaches a minimum temperature for a minimum period of time according to an officially recognized technical specification [ISPM Pub. No. 15, 2002]
Mark	An official stamp or brand, internationally recognized, applied to a regulated article to attest its phytosanitary status [ISPM Pub. No. 15, 2002]
Official	Established, authorized or performed by a National Plant Protection Organization [FAO, 1990]
Warm-up time	The initial time taken to attain the specified temperature of treatment

Wood packaging material: Wood or wood products (excluding paper products) used in supporting, protecting or carrying a commodity (includes dunnage) [ISPM Pub. No. 15, 2002]

Outline Requirements:

The raw wood packaging material is required to undergo approved treatment and marked according to ISPM-15 prior to export. It is the responsibility of Directorate of Plant Protection, Quarantine & Storage, being the National Plant Protection Organisation (NPPO) to issue appropriate guidelines for certification of forced hot-air treatment facilities so as to ensure that approved measures are applied consistently to wood packaging material and marking as per the international standard. These guidelines would facilitate in carrying out proper assessment and certification of heat treatment facilities to ensure that the treatments applied are consistent with provisions of ISPM-15.

Guidelines/procedures for certification of facilities

1.0. General Requirements

1.1. Authority to approve the facilities

The Plant Protection Adviser to the Government of India, Directorate of Plant Protection, Quarantine & Storage, N.H.IV., Faridabad (Haryana) shall be the competent authority to approve and certify the forced hot-air treatment (FHAT) facilities for treatment of wood packaging material for export to meet the requirements of ISPM-15.

1.2. Nomination of PQ Officers for inspection of facilities

Joint Director (PQ), in consultation with PPA, would nominate two PQ officers in the rank of Dy. Director (PP/Ent) and the other not below the rank of PPO for verification/performance testing of FHAT facilities for certification. The nominated officers would verify the facilities and carry out performance testing before making necessary recommendations for certification.

1.3. Application Procedures for Certification

All applications should be made in the prescribed format (Appendix-I) to the PPA in duplicate along with the requisite information as per data sheet (Appendix-II) and accompanied by a bank draft for Rs. 2000/- drawn in favour of 'Accounts Officer, Dte of PPQS., Faridabad' towards registration fee. The applications would be scrutinized and those duly completed in all respects would be registered by the PQ Division of Dte of PPQS, Faridabad-121001. PPA, if satisfied with the information provided by the applicant, shall order a preliminary inspection of the facilities to be completed with in one month from the date of registration.

1.4. Location, construction & design of facility

The location, construction and design of the facility should be as per the safety norms and standards prescribed by the concerned local Authority and as per approved engineering design and plans. PPA may refuse certification of the facility, if in his opinion safety deficiencies such as open motors with exposed gears, un-protected fan belts within 6ft from the floor level, exposed control panel, substandard equipments that do not guarantee required level of safety exist at the plant.

1.5. Minimum requirements of facility:

The minimum requirement for setting up a forced hot air treatment facility would include a heat treatment chamber of appropriate capacity, which should be adequately insulated at least 15 cm thickness with rock/glass wool on all sides to ensure proper retention of temperature during the period of treatment. A heat delivery system consisting electric heaters with required heat capacity and the blowers to blow heated air into the chamber through a close ended duct with provision to recycle the heated air and a motorized damper for exhausting 10% return air to remove moisture from the chamber after 10-15 min of the process time. A process control and interlocking system to provide adequate safety of operations and a PID single loop Temperature Controller holding a minimum of 6-8 temperature sensors connected to a paper-less temperature recorder. The list of essential equipments together with the specifications are presented in Appendix-IX.

1.6. Responsibilities of Approved Facility

The certified facility is responsible:

- to carry out all treatment operations through a qualified operator
- to report to the PPA of any disruption in service of the facility for 10 days or more on account of any mechanical and electrical failures or annual maintenance checks or any lay-offs or other reasons
- to maintain the equipments in good working condition and ensure periodical calibration of temperature sensors, control instruments and recorders
- to maintain proper records of all treatment operations carried out at the facility including the data logs or temperature record sheets or diskettes
- to ensure that all treatments of solid wood packaging material are carried out strictly in accordance with the approved protocol specified under ISPM-15 and affix the mark assigned to the facility on treated wood prior to export in line with ISPM-15.
- to abide by the instructions and guidelines issued by the PPA from time to time and extend all the cooperation to the PQ officers for carrying out performance tests and audit checks.

2.0. Special Requirements

2.1. Preliminary Performance Testing

If a facility has not previously been certified by the PPA, the qualified technical operator of the facility must carry out preliminary performance test on his own. The inspection officer nominated by the PPA would verify the facilities and ensure that all the equipments are in good working order and the check sheet given in Appendix-IV is duly filled and submitted to PPA. The operator should take immediate steps to correct any deficiencies encountered during preliminary performance testing and standardize the performance. Through the preliminary trials, the operator should establish a tentative temperature set point for the heater and chamber, so that the core temperature of wood blocks would attain the approved treatment temperature with in a reasonable time. The operator should carry out at least one trial treatment with empty chamber with sensors placed at appropriate positions as well as loaded chamber with wood packaging material such as pallets with sensors inserted into the core of wooden blocks to a depth of 5 cm and placed at appropriate positions. The data of preliminary performance testing should be submitted to the Dte of Plant Protection, Quarantine & Storage, Faridabad along with comments, if any, as evidence that the FHAT facility is ready for its official performance test. If PPA is satisfied by the preliminary performance trials, he may order carrying out final official performance test for certification with in a period of 15 days from the date of receipt of the trial data.

2.2. Procedures for conducting final performance test for certification

The final performance test would be carried out by two PQ officers nominated by the PPA in three stages viz., (1) calibrating the portable sensors; (2) calibrating the permanent sensors installed in the FHAT chamber; and (3) conducting an actual test treatment, as described below:

2.2.1. Calibrating the portable sensors

Using a factory-calibrated, certified glass-mercury thermometer (readable up to one tenth of a degree Celsius) as the standard, the PQ officer should compare the readings from each portable sensor to the standard and record any deviation. The calibration process should be carried out using a swirling hot water bath at or near required treatment temperature. Any sensor that deviates by plus or minus 0.3° C from the standard should not be used for calibration of permanent sensors. If cordless factory calibrated portable sensors are used, they require no further calibration. At least a minimum of three portable sensors would be required to be calibrated for the test.

2.2.2. Calibrating the permanent sensors installed in the FHAT chamber

The calibration of permanent sensors installed in the chamber or used to measure core temperature is done in a similar way using the calibrated portable sensors. For this purpose, the portable sensors with a zero correction factor may be used instead of certified glass-

mercury thermometer as standard against which permanent sensors are compared. The permanent sensors tested should pass the same level of accuracy as that of portable sensors

2.2.3. Conducting actual test treatment

The PQ officers nominated by PPA should carry out actual performance test by inserting both permanent and portable sensors into holes drilled in different solid wood blocks up to a depth of 6 cm and positioned at different heights in the chamber loaded with pallets. The exact placement of sensors should be indicated in three-dimensional diagram. The chamber should be closed and turned on the heater switch. The readings of sensors should be taken at least once every five minutes during warm-up and every 2 minutes during dwell-time. From the above readings, the warm-up time should be determined and run the dwell-time portion of treatment and hold for the minimum time specified by the approved treatment schedule i.e. 56⁰ C for 30 minutes. At the end of process, all temperature records from portable as well as from permanent sensors should be reviewed. If the test treatment successful, the nominated PQ officers should initial the log sheet and remove all the portable sensors after the chamber cools down to ambient temperature and submit a report in prescribed format (Appendix-IV) to PPA along with recommendations for issue of certificate. At least one successful test treatment is required either for certification or recertification as the case may be. If the facility meets the requirements of certification, a compliance agreement (Appendix-V) should be duly signed by the authorised signatory of the facility in the presence of nominated PQ Officers and forwarded to PPA.

2.3. Issuance of certificate of approval of facility

PPA, after verification of test report and the receipt of compliance agreement, may issue a certificate of approval of the facility in the prescribed format as described in Appendix-VI and assign the mark and code number to the certified facility for affixing on treated wood as per ISPM-15. The certificate of approval granted would be valid for one year from the date of issue and subject to renewal thereafter on yearly basis on payment of renewal fee of Rs. 1000/-. The application for renewal of certificate should be made to PPA at least 15 days in advance of expiry of certificate and no renewal would be granted after the expiry of the certificate

2.4. Frequency of Performance Testing

A fresh performance test must be carried out for renewal of certificate and as well as whenever the facility has been out of service for 15 days or more. In addition the permanent sensors installed in the FHT chamber should be required to be recalibrated daily when chamber is in use and whenever sensors are replaced.

2.5. Documents & Records to be maintained

The approved facility should maintain treatment records as per the format prescribed in Appendix-VII and the same should be serially numbered and duly signed by the qualified

technical operator and preserved in the appropriate folder along with prints of data loggers for future reference and necessary verification during audit checks by PQ Officer.

2.6. Quarterly reporting of treatments performed

The certified facility should submit a quarterly report (Appendix-VIII) to PPA for review of performance of treatment.

2.7. Refusal of Certification/Derecognition of Facility

PPA may refuse the certification of the facility because of safety deficiencies at the plant or if in his opinion, the equipment installed does not confer the required level of accuracy. However in the event of refusal, no refund of registration fee would be made. PPA may de-recognize the certification granted to any facility, if the facility does not abide by the terms and conditions stipulated in the certificate or if it fails to carry out the appropriate treatments consistent with this standard or if it is involved in clandestine affixing of mark without carrying out appropriate treatments or if it involves in maintenance of fraudulent records or in the event of receipt of notification of repeated non-compliance from the importing countries.

3.0. Operational Requirements

3.1. Pre-Treatment Procedures

The authorized operator should determine the moisture percentage of wood packaging material prior to loading in to the chamber. He should position the calibrated permanent sensors at different heights in front, rear & two sides of the chamber as indicated below:

- In case of FHA chamber that has bottom hot-air delivery, the sensors should be hung at the level of the top layer of pallet.
- In FHA chamber that has top air delivery, the sensors should be placed at the level of bottom layer of pallet.
- In a chamber that has top and bottom air delivery, the sensors should be placed at the level of middle layer of the pallets.
- Two sensors should be inserted to a depth of 5 cm in blocks of fresh wood and placed at appropriate position.

The loading of chamber should not be more than 75% capacity of the chamber.

3.2. Treatment Procedure

After loading the pallets into the chamber, the door should be closed before switching-on the power supply, heaters and blowers. The heater switch may be set at maximum heat position so as to attain heater temperature of about 74⁰C. The temperature recorder should be set to record temperature at every five minutes or make continuous pen-line recordings as the case may be, colour coded for each sensor, on a graph paper readable in tenths of a degree in Celsius. After warm-up period, the frequency of temperature recordings should be increased

to once every two minutes. The dwell time would start when the core temperature of wood blocks attains the temperature of 56⁰ C. The delivery air must be warmer than the targeted core temperature, but this matter would be left to the discretion of operator. The Dte of PPQS, would not require any particular temperature set point, because the treatment would be based on core temperature of wood and not on air-delivery temperature. The operator could have the flexibility to change the temperature of delivery of air at various times during treatment as well as blower speed.

3.3. Post-Treatment Procedures

At the end of treatment process, the chamber should be allowed to cool down gradually to an ambient temperature before the door is opened. It should be ensured that the treated wood does not get mixed up with raw wood and is not stored along side raw wood package material to prevent cross-infestation.

3.4. Marking of treated solid-wood packaging material

The treated wood packaging material should be marked as per the mark assigned to the approved facility. The mark should be affixed at visible location and should be stenciled with black ink or paint (not washable) as suggested in the enclosure to the certificate of approval.

3.5. Compliance checks on prescribed procedures

The PQ officer nominated by PPA should carry out compliance checks for ensuring that certified facility would meet the requirements set out in this standard in line with ISPM-15, which include monitoring certification and marking systems that verify compliance and establishing treatment procedures including auditing of facilities that apply the measures. Such audit checks/surprise visits should be carried out at least once in every six months period or at any such intervals as may be decided by the PPA. The nominated officer at the end of audit check/surprise visits to the facility should submit a report to PPA, of his observations and comments together with the list of non-compliances, if any and preventive and corrective measures to be undertaken.

Appendix-I

**Application for Certification of Forced Hot-Air Treatment Facility for
treating wood packaging material**

To The Plant Protection Adviser Dte of Plant Protection Quarantine & Storage N.H.IV., Faridabad-121001	For office Use
	Receipt No: Date of Receipt:
1.Name and address of the applicant	2. Location of the facility
3. Nature of business carried out	4. Particulars of Registration/Licensing Date of expiry of license.
5. Name and designation of the person responsible for the operation of facility	6. Whether it is for its own use or commercial facility?
7. Construction & design by	8. Whether separate storage facility for treated solid wood packaging material?
9. Details of Bank draft enclosed	10. Additional information, if any
<u>Declaration</u>	
<p>I/We declare that the information provided as above is complete and correct in all respects and that the facility has been set-up strictly in accordance with established safety norms/standards of local authority; and I/we read/understood the certification requirements of the facility and abide by the terms and conditions of certification prescribed there of by the Plant Protection Adviser to the Government of India</p>	
Date: Place:	_____ ((Authorised Signatory))
Seal	

N.B: Application form shall be submitted in duplicate along with a registration fee by a bank draft for Rs. 2000/- drawn in favour of Accounts Officer, Dte of PPQS, NH-IV, Faridabad-121001

Appendix-II

Data Sheet of Forced Hot –Air Treatment Facility (FHAT).

1. Name of the FHAT Facility:
2. Location of the FHAT Facility:
3. Particulars of construction/design/insulation of the facility:
(Enclose diagrammatic sketch of the facility)
4. Housing of FHAT Facility: Open Covered
5. Storage facility for treated wood packaging material, if any: Yes/No
(If yes, capacity in terms of number of pallets)
6. Interior Dimensions of Chamber (LWH in m):
7. Loading capacity per cycle (No of pallets & pallet size):
8. Power Supply & Source:
9. Generator support, if any and particulars thereof:
10. Operation of Facility: Automated/Manual
(If automated give particulars of computers & microprocessors & location)
11. Description of Voltage Stabilizers/Surge Protectors, if any:
12. Location of Control panel & power distribution:
(Supply line diagram)

(ii)

13. Description of Process Control/Interlocking/Safety Alarm

14. Specification of Electric Heaters/ Nos/Heat Capacity:

15. Specification of Blowers/Nos/ Motors/Blower Capacity:

16. Description of ducting & casing of heaters & blowers:
(Enclose hot-air flow diagram to the chamber)

(iii)

17. Specifications of PID Temperature Controller

18. Specification of Temperature Sensors/Make/Nos & Distribution:
(Enclose three-dimensional diagram indicating the position of sensors)

19. Specification of Temperature Recorder or Data logger/Make/Sensitivity of
Recording:

20. Description of Hot-Air delivery system to the chamber (Top/Bottom/ or Both)
/No of Grills & Grill Size:

21. Description of Recirculation &Exhaust Air System to the chamber

22. Description of loading system of pallets into the chamber

Date:

Place:

Seal

Authorised Signatory

Appendix-III

Checklist for Preliminary Evaluation/Testing of the FHAT Facility

S. No.	Evaluation/Testing of Activity	Yes	No	Critical Status
1.	Isolation of facility from other work areas			Non-critical
2.	Separate storage facility for holding of treated material			Non-critical
3.	Design & construction of the facility followed the standard safety & engineering norms			Critical
4.	Insulation of the chamber, ducting and casing of heater & blowers			Critical
5.	Electrical wiring through out the facility meet the safety code norms including earthing and PVC conduiting			Critical
6.	If automated facility, whether computers/microprocessors are located in air-conditioned to maintain accuracy and reliability and installed with surge protectors			Critical, if computerized
7.	Constant un-interrupted power supply			Critical
8.	Electrical generator to back-up power supply			Critical
9.	Process control & interlocking system provided to the facility and checked performance			Critical
10.	Safety alarm system provided and checked for performance			Critical
11.	Installation of PID Temperature Controller and testing			Critical
12.	Calibration of permanent sensors before installation in the chamber			Critical
13.	Installation of time/temperature control switches & testing			Critical
14.	Installation of heaters and checking heating capacity			Critical
15.	Installation of blowers and checking blower capacity			Critical
16.	Checking performance of temperature recorder/data logger and recording frequency			Critical
17.	Check the motorized damper for exhaust air for performance			Non-critical
18.	Arrangements for measuring core temperature of wood			Non-critical
19.	Additonal points (ports) in the wall of chamber for insertion of portable sensors for performance testing.			Non-critical
20.	Check the uniform airflow circulation in the chamber			Non-critical
21.	Check the railings of the platform for smooth loading in/unloading out of wooden pallets.			Non-critical
22.	Arrangements for measuring moisture content of wood-packaging material.			Non-critical
23.	Control panels/Electric Meters etc., are adequately rain protected			Critical
24.	Installation of fire fighting equipment at the facility			Critical
25	<hr style="width: 100%;"/> (Name & Signature of Inspecting PQ Officer w/date)	<hr style="width: 100%;"/> (Name & Signature of Authorised operator w/date)		

Appendix-IV

Format of Official Performance Test Report

1. Name/ location of Facility:

2. Description of Facility:

3. Dates of Inspection

4. Results of Preliminary Performance Test

5. Comments of Preliminary Performance Test

6. Results of Official Performance Test for Certification

- (i) Results of calibration of portable sensors
- (ii) Results of calibration of permanent sensors installed in the chamber
- (iii) Results of actual test treatment (single cycle)
- (iv) Results of continued performance test (3 cycles or more)

7. Name & Designation of Officers associated with testing:

8. Remarks & Recommendations for Certification:

9. Signatures of officers Nominated for Testing

1. _____
(Name & Designation of Officer)

2. _____
(Name & Designation of Officer)

10. Counter Signature by:

(Name & Designation of Counter Signing Officer)

Appendix-V

COMPLIANCE AGREEMENT		
1. From	2. To The Plant Protection Adviser Dte of Plant Protection Quarantine & Storage, N.H-Faridabad-121001	
3. Agreement related to Forced Hot Air Treatment of Solid Wood Packaging material		
4. Applicable Phytosanitary Regulatory Requirements To meet the Requirements of ISPM-15		
5. I/we agree to the following: <ul style="list-style-type: none"> -to carry out all treatments through trained/qualified operator -to ensure periodical calibration of temperature sensors and maintain the facility in working condition -to provide all testing equipments, labour and extend necessary assistance and cooperation to the nominated PQ officers during the visit to the facility for undertaking performance tests/audit checks of the facility -to follow all safety requirements or procedures during treatment operations and abide by the instructions and procedures required by the Plant Protection Adviser in the planning, setup and conduct of treatment - to carry out heat treatment of solid wood packaging material as per the standards prescribed under ISPM-15 and mark the treated wood as per the code number & marking assigned -to main record of treatment operations as per format prescribed and preserve data logs for future verification -to pay TA/DA for the inspecting PQ officers as per admissible rules for carrying out preliminary performance test/official performance test for certification. 		
6. Authorised Signatory: _____	7. Designation	8.Date:
()		9.Place
9. Signed in presence of _____		Office Address
(Name/ /Signature of PQ officer)		
10. Approved by the PPA _____		Stamp of Organisation
()		

Appendix-VI

(Emblem)
Government of India
Ministry of Agriculture
Department of Agriculture & Cooperation
Directorate of Plant Protection, Quarantine & Storage
N.H-IV Faridabad-121001

Certificate No.

Date of Issue:
Valid up to:

Certificate of Approval of Forced Hot Air Treatment Facility

This is to certify that the Forced Hot Air Treatment Facility as described below has been inspected and certified for treatment of wood packaging material so as to meet the requirements of ISPM-15 and the details of mark assigned to the firm and the terms and conditions stipulated over leaf:

1. Name of the Facility:
2. Location of the Facility:
3. Capacity of the Facility:
4. Code Number assigned to the Facility:

Date:

Place:

Seal

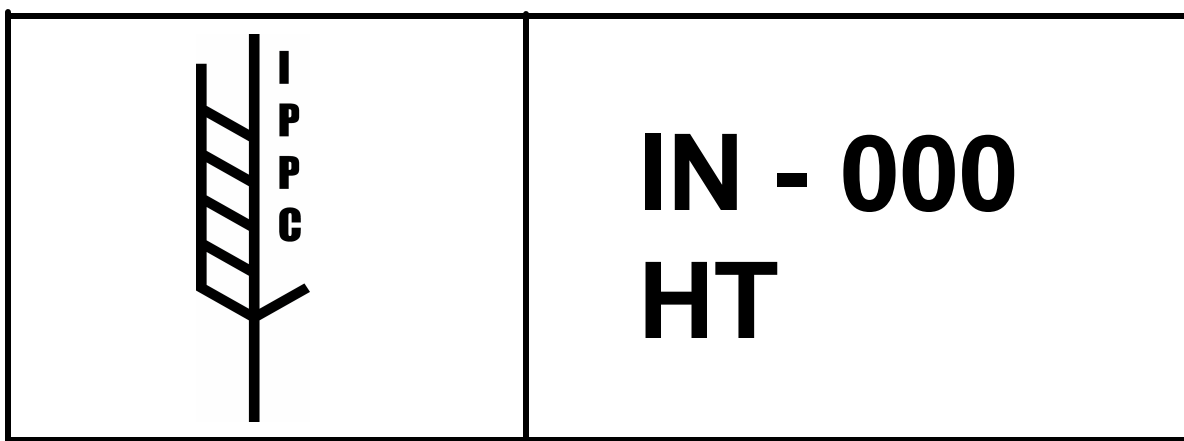
()
Plant Protection Adviser
Dte PPQS, Faridabad

(ii)

Terms & Conditions:

1. The Certificate should be displayed at prominent place and available for verification during inspections to the facility;
2. No alterations or corrections would be permitted on the face of the certificate
3. The certificate would be deemed to be invalid for other than the purpose for which it is given.
4. All the treatment operations should be performed by a qualified operator of the firm and necessary treatment records/data log sheets are maintained for necessary verification
5. All the treatments should be performed as per the standards laid under ISPM-15 and the treated packaging material should be marked with assigned code number prior to export as per ISPM-15.
6. The certified facility should abide by the instructions and guidelines issued by the Plant Protection Adviser from time to time
7. The certified facility should submit a compliance agreement to the Plant Protection Adviser at the time of issuance of the certificate duly signed by the authorised signatory of the firm.
8. The certificate would be valid for one year from the date of issue unless otherwise revalidated and firm should apply for revalidation at least one month before expiry of certificate.
9. No liability would lie with the officers of Dte of P PQS towards issuance of the certificate.

Mark Assigned to the Facility:



Foot Note: Markings should be according to the model shown above (12 x 6 cm), legible, permanent, not transferable, placed in a visible location and preferably marked by a stencil with black ink. The letter size should be a minimum of 2.5 cm. Recycled, remanufactured or repaired wood packaging material should be re-certified and re-marked. All components of such material should have been treated.

Appendix-VII

Treatment Record

1. Name of the Facility		2. Location		3. Code No:	
4. TR No.			5. Date of Treatment		
6. Exporter Name & Address			7. Consignment/shipping particulars		
8. Description of package material Treated		9. Country of Export	10. Quantity Treated		11. Batch No.
12. Actual Time Log (24 hrs Time)		From		To	
13. Starting Time		14. Attaining Time of 56⁰C		15. Ending Time	
16. Total Treatment Period (in min.):					
17. Warm-up Time:			18. Dwell Time:		
19. Temperature Recordings of Sensors (Attach log sheet)					
Recorder		Starting Time		Attaining Time	
Recorder Heater 1					
Recorder Heater 2					
Recorder Zone 1					
Recorder Zone 2					
Recorder Zone 3					
Recorder Zone 4					
Recorder Core 1					
Recorder Core 2					
20 Moisture percentage of wood packaging material		Before treatment:		After Treatment:	
21. Comments, if any:					
22. Name & Signature of Authorised Operator w/date					

Appendix-VIII

Quarterly Report

1. Name of the Facility:				2. Code Number:		
3. Location:				4. Period of Reporting:		
5. Details of Treatment:						
Month & Year	Description of packaging material treated	Quantity (No of Units/ Volume in cu. m) treated	No of Treatment Cycles	Country of Export	Treatment Period	
					Warm-up Time (Monthly Average)	Dwelling Time (Monthly Average)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
6. Remarks, if any				7. Name & Signature of Operator		

Appendix-IX

List of Essential Equipments

S. No.	Equipment	Make	Quantity	Specifications
1.	Temperature Sensors	Gefron (Italy) or equivalent	7	Sensor type: RTD (PT-100) Diameter: 4mm Temperature range: 0-400 ⁰ C Length: variable (95 mm to 230 mm)
2	PID Temperature Controller	Honey Well or Equivalent	1	Controller Type: PID Single loop I/P Signal Type: Analog Universal (RTDs, Thermocouple, mV, mA) O/P Signal Type: Analog (4-20 mA & SSR O/P) Digital O/P Type: Relay O/P with Two NO/NC Contact (Rating 5 Amp) Supply Voltage: 220 V/50 HZ Working Range: 0-200 ⁰ C Accuracy: 0.5% of Span Cutout Size: 96 X 96 mm
3	Paper less Temperature Recorder (Data logger)	Honey Well or Equivalent	1	Input: Six Universal (T/C, RTD, mV, V, mA) Screen size: 5" colour LCD Data Storage: 1:44 MB Floppy Memory Buffer: 2MB Battery Back up Ethernet Connectivity: Provided Fuzzy Logging: Provided Alarm: 32 Integrated Soft Alarms Power Supply: Universal (90-250 V, AC) Dimensions: 144 X 144 mm
4.	Blowers	BIS Marked		Capacity: 12000 CFM Motor: 3.5 K.W. Input Supply: 3 Phase/415 V, 15 A
5	Electrical Heaters	BIS Marked		Capacity: 494740 BTU/hr Electric Supply: 150 KW

