BMTPC
PACS
PERFORMANCE APPRAISAL CERTIFICATION

Name and Address of Certificate Holder:
M/s Mutha Industries Pvt. Ltd.
51, Advent, 12- A Gen.
Jagannathrao, Bhosale Marg,
Nariman Point, Mumbai - 400021
Tel: 022-40334567/4569
Email: info@muthaindustries.com

Performance Appraisal Certificate No.
PAC No.:**1017-P/2015**
Issue No. **01**
Date of Issue: **24.04.2015**

Bamboowood Products

User should check the validity of the Certificate by contacting Member Secretary, BMBA at BMTPC or the Holder of this Certificate.

bmtpc

Building Materials & Technology Promotion Council
Ministry of Housing & Urban Affairs
Government of India
Core 5A, First Floor, India Habitat Centre,
Lodhi Road, New Delhi – 110 003

Tel: +91-11-2463 6705, 2463 8097; Fax: +91-11-2464 2849
E-mail: info@bmtpc.org Web Site: http://www.bmtpc.org

PERFORMANCE APPRAISAL CERTIFICATE

FOR

BAMBOOWOOD PRODUCTS

ISSUED TO

M/s MUTHA INDUSTRIES PVT. LTD.

STATUS OF PAC 1017-P/2015

S. No.	Issue No.	Date of Issue	Date of renewal	Amendment		Valid up to (Date)	Remarks	Signature of authorized signatory
				No.	Date			
1.	2.	3.	4.	5.	6.	7.	8.	9.
1	1	24.04.2015	–	–	–	23.04.2016	—	
2	2		24.04.2016	–	–	23.04.2018	—	
3	3		24.04.2018	–	–	23.04.2020	—	
4	4		24.04.2020	–	–	23.04.2021	–	
5	5		24.04.2021			23.04.2022		
6			24.04.2022			23.04.2023		
			24.04.2023			23.04.2025		
			24.04.2025			23.04.2027		

CONTENTS

PART 1 CERTIFICATION

1.1 **Certificate Holder:** M/s Mutha Industries Pvt. Ltd.
51, Advent, 12- A Gen. Jagannathrao
Bhosale Marg, Nariman Point,
Mumbai -- 400021
Tel: 022-40334567/4569
E-mail: info@muthaindustries.com

1.2 **Description of System**

1.2.1 *Name of the System* – Bamboowood Products

1.2.2 *Brand Name* – Epitome

1.2.3 *Brief Description* –Epitome Bamboowood products are made from Strand woven bamboo. It is a conversion of bamboo to wood. Bamboowood products are an eco-friendly product made from bamboo, the fastest growing plant on earth. Bamboo travel through boiling process or burn it under high pressure stream to remove starch and sugar content to make it termite resistant. Further, voc compliant phenolic resin is used as binder. Bamboo is one of the natural materials available for Flooring, wall Paneling – indoor & outdoor, Ceiling, outdoor decking, furniture, structures, Door & Windows – frames, shutters and panels, bespoke bamboowood pole etc and is an alternative of hard wood. Bamboo has a higher fiber rating than any other hard wood which gives it exceptional hard-wearing qualities. Flooring, celling and wall paneling are coated with 9 layers of UV coat while decking shall be coated with oil and other items shall be coated with water based polyurethane coating.

1.2.4 *Types of Epitome Bamboowood Products*

1.2.4.1 *Flooring*
It is suitable for the indoor areas. This is shown in Figs. 1 to 3.

1.2.4.2 *Decking*
It is suitable for the outdoor areas. This is shown in Fig. 4.

1.2.4.3 *Cladding (Indoor & outdoor wall paneling)*
Indoor Cladding This is shown in Fig 5
Outdoor Cladding This is shown in Fig 6
It is suitable for the walls.

1.2.4.4 *Ceiling* This is shown in Fig. 7

1.2.4.5 *Furnitures* This is shown in Fig 8,

1.2.4.6 *Doors - Frames, panels & Shutters* This is shown in Fig 9

1.2.4.7 *Bespoke Bamboowood Poles* This is shown in Fig 10

1.2.4.8 *Bamboowood Structures* This is show in Fig. 11 & 12

1.2.4.9 *Windows - Frames, panels & Shutters* This is shown in Fig 13 & 14

.

1.2.5.1 *Size & thickness of various Epitome Bamboowood products are as follows:*

**Size and thickness*

Sr. No.	Description	Thickness (mm)	Size W x L (mm)
1.	Epitome Bamboowood Flooring	14	131 x 1880/1850
2.	Epitome Bamboowood Flooring	12	133 x 1880/1850
3.	Epitome Bamboowood Flooring	10	135 x 1900/1870
4.	Epitome Bamboowood Decking	20	135 x 1900/1870
5.	Epitome Bamboowood Cladding	8	135 x 1900/1870
6.	Epitome Bamboowood Cladding	8	65 x 1900/1870
7.	Epitome Bamboowood Ceiling	8	135 x 1880/1850
8.	Epitome Bamboowood Furnitures		Customized as per requirement
9.	Epitome Bamboowood Bespoke Poles	Dia 20 mm to 150 mm	Customized as per requirement
10.	Epitome Bamboowood Structures		Customized as per requirement
11.	Epitome Bamboowood Door / Window Frames & Shutters		Customized as per requirement
	*** Sizes can vary/customized as per the client requirement**		

1.2.5.2 *Accessories*

S. No.	Description	Thickness (mm)	Size (mm) W x L
1.	Skirting	14/12/10	100 / 85 x 1900
2.	Reducer	1412/10	44 x 1900
3.	T- mould	14/12/10	44 x 1900
4.	Threshold	14/12/10	44 x 1900
5.	Stair-nose	20	85 x 1900
6.	Quarter Round	18	18 x 1900

Fig. 1

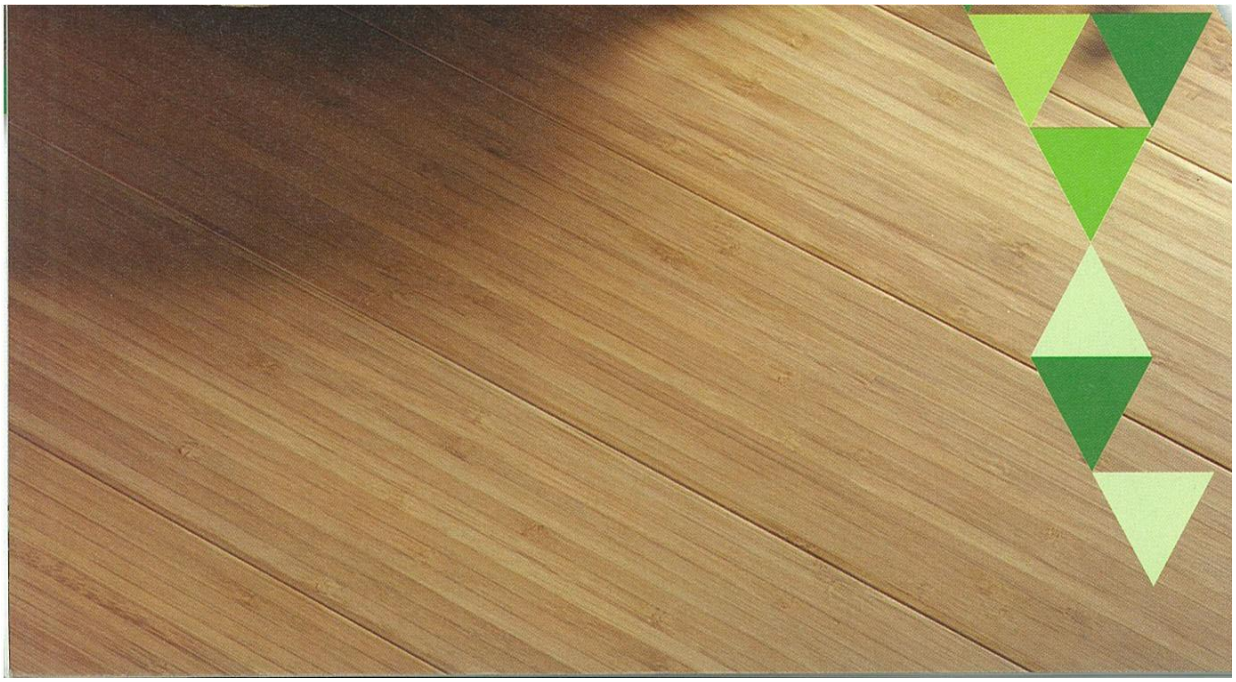


Fig. 2

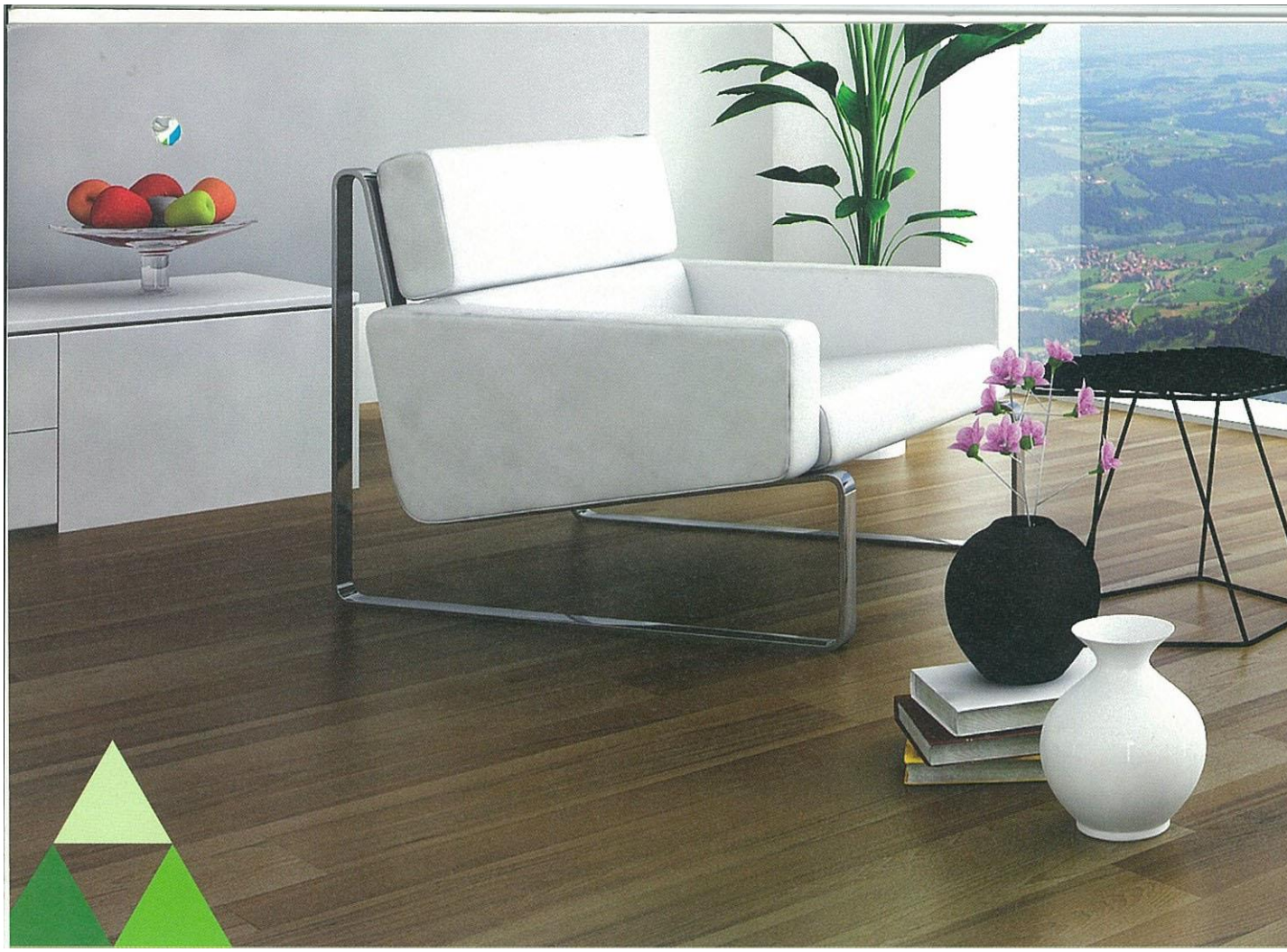


Fig. 3

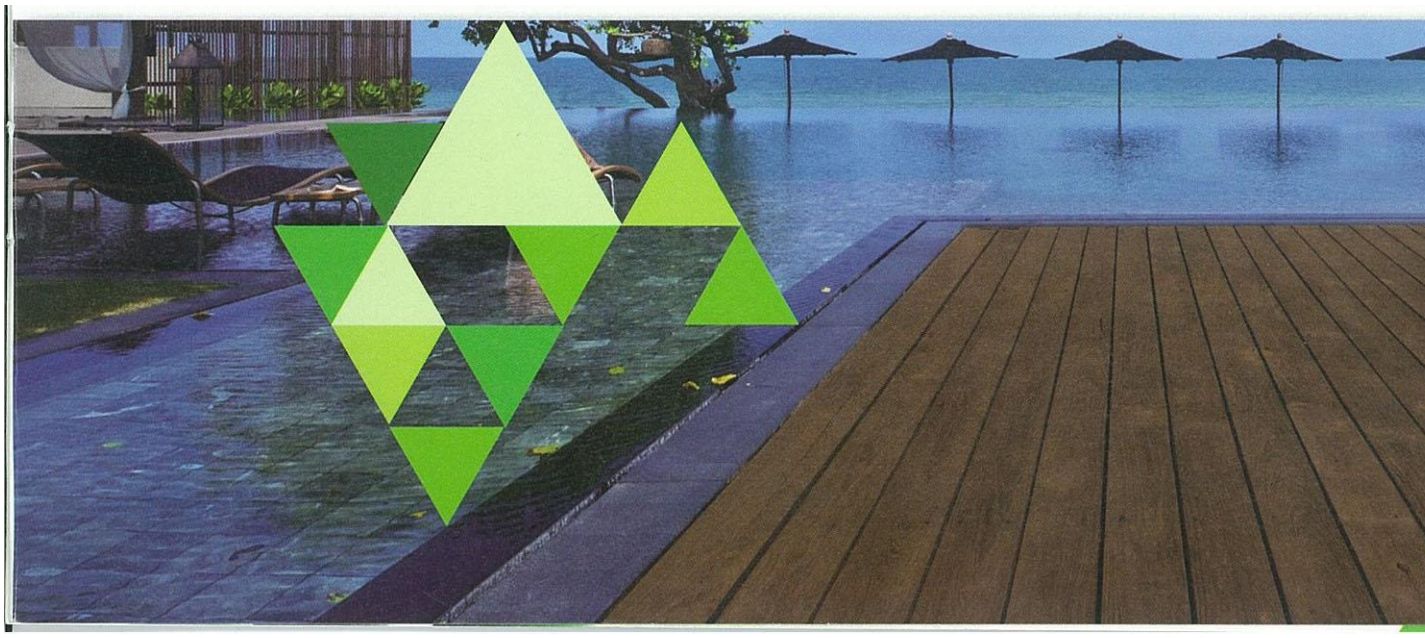


Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig.9

Fig.10

Fig. 11

Fig. 12

Fig. 13

Fig. 14

1.3 Manufacturing Process

1.3.1 The strand woven bamboo is hand selected from the cultivation Areas by a team of experts of the firm. The bamboo is then carefully Transported to the factory. The four stages of manufacturing process are as follows:

1.3.1.1 *Primary*
The bamboo is cleaned while its skin and knots are removed. It is then sliced into strips and crushed into strands – fibers that will come together for further treatment.

1.3.1.2 *Secondary*
The bamboo strands are then cured, naturally and artificially, for strength. These strands shall then be compressed to create bamboowood beams.

1.3.1.3 *Tertiary*
The beams are then smoothened out and sliced into different thicknesses for Flooring, wall Paneling – indoor & outdoor, Ceiling, outdoor decking, furniture, structures, Door & Windows – frames, shutters and panels, bespoke bamboowood pole. The bamboowood planks shall return to be seasoned naturally and artificially (kiln dried) for high grade stability.

1.3.1.4 *Finishing*
The products are then coated with UV/ OIL / PU coating depending on end use. This process is for ensuring durability and robustness.

The manufacturing process Flow Chart is shown in **Annex. II**.
The manufacturing process is shown in Fig. 15

For detailed Epitome Bamboowood products manufacturing process, reference shall be made to the Standard Operating Procedure of the PAC holder.

Fig. 15

1.4 Assessment

1.4.1 *Scope of Assessment*

Scope of assessment included suitability of Epitome Bamboowood to the specified requirements for use in buildings, houses, offices etc. as:

i) Flooring,
ii) wall Paneling – indoor & outdoor,
iii) Ceiling,
iv) outdoor decking,
v) furniture,
vi) structures,
vii) Door & Windows – frames, shutters and panels,
viii) bespoke bamboowood pole

1.4.2 *Basis of Assessment*

Assessment of the suitability of Bamboowood is based on:

i) Inspection of the factory for production and quality assurance of the product.
ii) Test Reports of Bamboowood flooring tiles for natural, carbonized, stain and wall finish for various characteristics by KLUMPP, Singapore.
iii) Test Reports of Bamboowood flooring tiles to determine the formaldehyde content in the board by Perforator method by Centre for Testing & Evaluation of Wood Composites, IPIRTI, Bangalore.
iv) Test Reports of Bamboowood flooring tiles for various characteristics by Centre for Testing & Evaluation of Wood Composites, IPIRTI, Bangalore.
v) Quality Assurance Scheme followed by the Certificate holder for process control.
vi) ZED – Silver Rating issued by ministry of micro, small & medium enterprises and quality council of India.

1.5 Uses & Limitations of the system

1.5.1 *Uses*

Bamboowood Products shall be suited for the following uses:

1.5.1.1 *Indoor*

i) Home, office, mall etc. flooring with accessories
ii) Sport stadiums, Auditoriums etc. special floors with special installation requirements
iii) Paneling/cladding etc.
iv) Door / Window frames & shutters
v) Furnitures
vi) Ceilings (Panels & Baffles)

1.5.1.2 *Outdoor*

i) Decks of any use
ii) Canopy, lawn area
iii) Portico, entrance etc.

1.5.1.3 *Structures*

i) Kiosk / Canopy / Portico / Pergola
ii) Shed

1.5.1.4 Bespoke bamboowood poles

i) Ceiling
ii) Wall
iii) Baffles
iv) Column cladding

1.5.2 *Limitations*

i) Indoor products shall not be used for outdoor use and vice-versa
ii) There shall be difference in kind of finish for indoor and outdoor

1.6 Conditions of Certification

1.6.1 *Technical Conditions*

1. Raw materials and the finished products shall conform to the requirements of the prescribed specifications.
2. The products to be installed shall be in accordance with the specifications, manufacturing & installation process prescribed by the manufacturer.

1.6.2 *Handling of User Complaints*

1.6.2.1 The Certificate holder shall provide quick redressal to consumer/user complaints proved reasonable & genuine and within the conditions of warranty, if provided by it to customer/purchaser.

1.6.2.2 As part of PACS Certification, data shall be maintained on such complaints with a view to assess the complaint satisfaction and suitable preventive measures taken.

1.6.3 *Quality Assurance*

The Certificate Holder shall implement & maintain a quality assurance system in accordance with Scheme of Quality Assurance (SQA) given in **Annex I** attached with this Certificate.

1.7 Certification

On the basis of assessment given in Part III of this Certificate & subject to the conditions of certification, use & limitations set out in this Certificate and if selected, installed & maintained as set out in Part I & II of this Certificate, the Bamboowood Products covered by this Certificate is fit for use set out in the Scope of Assessment.

PART 2 CERTIFICATE HOLDER'S TECHNICAL SPECIFICATIONS

2.1 General

2.1.1 The PAC holder shall manufacture the Bamboowood Products in accordance with the specifications, manufacturing & installation process prescribed by the manufacturer.

2.2 Specifications for the Epitome Bamboowood Products & Design Information

2.2.1 T*echnical Specifications*

Epitome Bamboowood is made from Strand woven bamboo. It is a conversion of bamboo to wood. Bamboo has a higher fiber rating than any other hard wood which gives it exceptional hard-wearing qualities. Flooring, ceiling and wall paneling are coated with 9 layers of UV coat while decking shall be coated with oil and other items shall be coated with water based polyurethane coating.

2.2.2 *Raw Materials*

2.2.2.1 *Bamboowood*

(i) Bamboo shall be matured, fresh, have no pin holes, no decay, no de-colorization
(ii) Boric acid shall be of 99.5% purity
(iii) Borax shall be of 99.5% purity
(iv) Phenol shall have 99.9% dry mass w/w
(v) Formaldehyde shall be of 37% concentration
(vi) Caustic soda shall have 99.9% dry mass w/w
(vii) Hydrogen peroxide shall be of 50% concentration

2.2.2.2 Products (Beam, Flooring, wall Paneling – indoor & outdoor, Ceiling, outdoor decking, furniture, structures, Door & Windows – frames, shutters and panels, bespoke bamboowood pole).

i) Density shall be ≥ 1000 Kg/m^3 in accordance with IS 1708 (Part 2):1986
ii) Modulus of Rupture shall be ≥ 150 N/mm^2 in accordance with IS 1708 (Part 5):1986
iii) Modulus of elasticity shall be ≥ 17500 N/mm^2 in accordance with IS 1708 (Part 5):1986
iv) Flammability (time taken for second ignition) shall be ≥ 5 min in accordance with IS 1734 (Part 3):1983
v) Flame penetration (time taken for flame penetration from bottom to top surface) shall be ≥ 30 min in accordance with IS 1734 (Part 3):1983
vi) Rate of burning (time taken to lose weight from 70% to 30%) shall be ≥ 10 min in accordance with IS 1734 (Part 3):1983
vii) Thermal conductivity shall be ≤ 0.50 W/m-K in accordance with IS 3346:1980

2.2.2.3 Bamboowood *Flooring, Cladding & Ceiling Finish*

(i) Gloss value shall be 30 ± 5% in accordance with DIN EN ISO 2813:1994
(ii) Cross cut test shall be ≤ GT 2 in accordance with DIN EN ISO 2409:2007
(iii) Abrasion resistance – initial point shall be > 100 cycle in accordance with DIN EN 438-2:1991 (500g load per wheel S 33)
(iv) Abrasion resistance – initial point shall be > 6000 cycle in accordance with ASTM D 4060:1995 (500g load per wheel CS 17)
(v) Scratch resistance (pencil hardness) shall be ≥ 1H in accordance with ISO 15184:2012
(vi) Scratch resistance (coin test) shall be ≥ 20 N in accordance with Hamburger planner
(vii) Scratch resistance (surface) shall have No scratch as per Steel wool test, Type 2
(viii) Impact resistance shall be ≥ 2 N in accordance with DIN EN 438 Part 2-12:2005
(ix) Resistance to indentation shall be ≥ 1 N in accordance with DIN EN 438 Part 2-14:2005
(x) Chemical resistance shall be 5 in accordance with DIN 68861-1:2011
(xi) Heat resistance (cigarette test) shall be 6A in accordance with DIN 68861 – 6:2011
(xii) Inflammability shall be B1 in accordance with DIN 4102 Part 14:1990

2.2.3 *Design Parameters*

Data design parameters required for design where the product is used:

- Floor plan
- Dimensional details
- Construction type for product required
- Ventilation provisions
- Location
- Weather extreme high & low values of temperature and humidity

2.3 Installation Guidelines

2.3.1 The Epitome Bamboowood flooring shall be installed on the following types of sub-floor:

i) *Concrete sub-floor* – The desirable floor base shall be strong, dry and have no open cracks
ii) *Plywood sub-floor* -- The desirable floor base shall be free from emission and properly installed on graded floor
iii) *Other sub-floor* -- The desirable floor base shall be standard batten, treated and seasoned sub-floor

The sub-floor level shall be maintained at ‘zero level’

There shall be no grease, oil, wax, dust and sand etc. on the sub-floor.

2.3.2 *Floating Floor Installation*

i) Floor shall be cleaned
ii) Underlay or high-density foam shall be used
iii) The sheet shall be unrolled on the longest wall
iv) The sheet shall not be overlapped
v) The guide floor piece shall be placed first
vi) Expansion gap shall be left
vii) The guide shall be laid by nail down method
viii) Floor tiles shall be spread to normalize and color sorting
ix) Rectangular alignment shall be checked
x) Floor tiles to be used next shall be aligned
xi) Two tiles shall be locked
xii) Same process shall be continued for next floor tile
xiii) The tiles shall be pushed to lock each other well by using controlled force
xiv) Floor tiles shall be laid & aligned continuously and locking process shall be repeated
xv) Guide shall be removed, and tile placed in last
xvi) Skirting/molding/quarter round shall be fixed
xvii) New floor shall be allowed to acclimatize for 24 hrs
xviii) The Bamboowood flooring can be fixed now.

2.3.3 *Nail Down Floor Installation*

i) Floor shall be cleaned
ii) Anti-friction poly sheet shall be laid
iii) Guideline expansion joints shall be marked 6mm from end and 15mm sideways
iv) Floor tiles shall be spread to normalize and color sorting
v) The guide shall be laid by nail down method
vi) The tiles shall be arranged and laid in regular or other design
vii) The tiles shall be pushed into each other
viii) The floor nailer shall be used to nail down tiles
ix) Expansion guide strips shall be removed
x) Skirting/molding/quarter round shall be fixed
xi) New floor shall be allowed to acclimatize for 24 hrs
xii) The Bamboowood flooring can be fixed now.

2.3.4 *Glue Down Floor Installation*

i) Floor shall be cleaned
ii) Guideline expansion joints shall be marked 6mm from end and 15mm sideways
iii) The guide shall be laid by nail down method
iv) Floor tiles shall be spread to normalize and color sorting
v) Glue shall be applied by using trowel
vi) Glue shall be used below room temperature
vii) Glue shall be used gradually, and tiles shall be laid outwards
viii) The tiles shall be cleaned/wiped in case any glue mark seen/noticed

ix) The tiles shall not be cut over glue spread area
x) Soft roller shall be used to get an even and good bond between subfloor and tiles
xi) The glue shall be cleaned/wiped if it comes out on top
xii) Guide shall be removed, and tile placed in last
xiii) Skirting/molding/quarter round shall be fixed
xiv) New floor shall be allowed to acclimatize for 24 hrs
xv) The Bamboowood flooring can be fixed now.

2.3.5 *Decking Installation*

i) Floor shall be cleaned
ii) Battens shall be placed with a gap of not more than 500mm
iii) Batten shall be nailed down into subfloor
iv) Clip shall be installed on the back of deck tile by 2.5mm dia. and 10mm long screw
v) First deck tile shall be installed
vi) Hole shall be drilled to fix 4mm screw
vii) Tile shall be fixed with batten by using clip and 2.5mm screw
viii) Same process shall be repeated to fix next deck
ix) New floor shall be allowed to acclimatize for 24 hrs
x) The Bamboowood flooring can be fixed now.

Detailed installation guidelines along with illustrations are given in **Annex III.**

2.3.6 Details of furniture, bespoke bamboowood pole, structures, Door & Windows – frames, shutters and panels are as per manufacturers guidelines.

2.4 Maintenance Guidelines

2.4.1 Epitome Bamboowood Products shall be maintained by hardwood floor cleaners as recommended to ensure that floor stays looking good. It shall be ensured that hardwood floor cleaners are water base, non-toxic cleaner which has been designed for finished hardwood floors. Cleaner shall be used as per manufacturer's instructions.

2.4.2 *Types of Drying Methods for the Floors are as follows:*

2.4.2.1 *Dry mop*
Dirt and grit shall always be removed prior to cleaning Bamboowood floors with an electrostatic dust control mop/ soft mop/ vacuum cleaner. Bristle broom shall be avoided.

2.4.2.2 *Dry spray*
The area of floor or the cleaning pad shall be mist with the hardwood floor cleaner.

2.4.2.3 *Wipe*
The floor shall be cleaned with a microfiber cloth or mop using a back and forth motion until it is dry. Soiled mop or cloth shall be replaced once it becomes soiled to avoid streaking.

2.4.3 *Do's and Don'ts*

2.4.3.1 *Do's*

i) The floor shall be cleaned regularly. Recommendations for cleaning the floor as a guide shall be as follows:
   - Low frequented area (residential) – about every 2-4 weeks
   - Medium frequented area (offices) – about every 1-2 weeks
   - High frequented area (public places) – about every 1-2 days

ii) Spills shall be removed promptly

iii) Mats at exterior and interior doors shall be placed to trap sand and grit from incoming traffic

iv) Heavy furniture or appliances shall always be picked rather than sliding them across the floor

v) Any minor scratches or damage shall be repaired using hardwood flooring cleaners

2.4.3.*2* *Don'ts*

i) Do not steam mop or wet mop floor surface area after installation. Excess water can cause swelling

ii) Do not let sand, dirt or grit build up. They act like sandpaper and actually abrade and dull the floor finish.

2.4.3.3. Please refer to **Annexure IV** for maintenance of bamboowood products

2.5 Sampling

2.5.1 *Lot*

2.5.1.1 In any consignment all the bamboowood products of the same type, shape, size and manufactured from the same raw materials under relatively similar conditions of production shall be grouped together to form a lot for inspection.

2.5.1.2 Samples shall be collected and inspected from each lot separately to ascertain its conformity or otherwise to the requirement of the specification.

2.5.2 *Scale of Sampling*

2.5.2.1 The number of samples to be selected for the sample from a lot shall depend upon the size of the lot and shall be in accordance with the col 1, 2 and 3 of Table 2.

2.5.2.2 All the tiles in the sample shall be selected at random from the lot. In order to ensure randomness of selection, procedures given in IS 4905:1968 may be followed.

2.5.3 *Number of tests and criteria for conformity*

2.5.3.1 The no. of tiles in the first sample shall first be subjected to the Routine tests.

If in the first sample the no. of defective tiles i.e. those failing to satisfy any one or more of the acceptance tests is equal to the corresponding acceptance no. *a* (col 5), the lot shall be considered as conforming to the requirements of the routine tests. If the no. of defective tiles in the first sample is more than or equal to the corresponding rejection no. *r* (col 6), the lot shall be considered as not conforming. If the no. of defective tiles in the first sample lies between the corresponding values of *a & r*, a second sample (col 2 &3), shall be selected and subjected to the routine tests. If in the combined sample, the no. of defective tiles is less than or equal to the corresponding acceptance no. *a,* the lot shall be considered as conforming and if, the no. of defective tiles is more than or equal to the corresponding rejection no. *r*, the lot shall be considered as not conforming.

Sample size

(Clause 2.5.3.1)

No. of tiles in the lot (1)	**Sample (2)**	**Sample size (3)**	**Cumulative Sample size (4)**	**Acceptance Number (5)**	**Rejection Number (6)**
Up to 100	First Second	5 10	5 15	0 1	0 2

2.6 Packing and Marking

2.6.1 Bamboowood products shall be packed in foam, one set of such tiles again wrapped in poly pack and expose to infrared shrinking tunnel for airtight packing. Pre-shrink wrapped tiles shall be placed into corrugated box which shall be made by using 180gsm, 3 ply, 13kg/cm^2, 20Bf paper; of wall thickness 4.5mm and 0.7kg/m^2 weight. Each box shall be marked with the following information:

a) Name of the manufacturer or trademark
b) Lot or batch number; year of manufacture
c) Color
d) Dimensions
e) Quantity in no., sqm or sq. ft.

2.7 Choosing Size and Thickness

Appropriate size and thickness of the bamboowood products shall be chosen to suit the requirement of the work.

2.8 Skilled /Training needed for Installation

Epitome Bamboowood Products shall be installed by experienced carpenters in accordance with the technical literature and installation guidelines of the manufacturer.

2.9 Guarantees/Warranties provided by the PAC Holder

The manufacturer shall furnish a warranty for a period of 5 years from the date of supply to the original purchaser provided the flooring is installed strictly in accordance with the applicable specifications, instructions and guidelines of the manufacturer. A brochure giving relevant warrantee

details shall be made available to the client.

2.10 Services provided by the PAC Holder to the Customer

In-house testing of formwork at regular intervals as per the Quality Control Assurance requirement shall be ensured by PAC Holder.

2.11 Manuals & Guidelines

All the manuals and guidelines etc. relating to Operation, Quality, Installation, Maintenance etc. shall be provided by the manufacturer.

2.12 Responsibility

Quality of installation of the flooring on site is the responsibility of the trade persons engaged by the agency.

PART 3 BASIS OF ASSESSMENT AND BRIEF DESCRIPTION OF ASSESSMENT PROCEDURE

3.1 Assessment

3.1.1 The assessment has been done as per provisions of the standards listed in Part V of this Certificate.

3.1.2 The assessment of the system is based on the Bamboowood Products manufactured, used and installed as per statement given in the PAC. However, assessment of the suitability of flooring manufactured as flooring, decking, cladding and paragola in buildings, houses, offices etc. is based on:

i) Inspection of the factory for production and quality assurance of the product.

ii) Test Report of Bamboowood flooring tile finish for Standard and Lifetime finishing for various characteristics got done by the manufacturer on 14/03/2014 from Friedrich Klumpp GmbH, Singapore.

iii) Test Report of Bamboowood flooring tiles to determine the formaldehyde content in the board by Perforator method got done by the manufacturer on 23/06/2014 from Centre for Testing & Evaluation of Wood Composites, IPIRTI, Bangalore.

iv) Test Report of Bamboowood flooring tiles for various mechanical properties got done by the manufacturer on 23/06/2014 from Centre for Testing & Evaluation of Wood Composites, IPIRTI, Bangalore.

v) Test Report of Bamboowood flooring tile finish for natural finish, carbonized finish, satin finish and wall finish for various characteristics got done by the manufacturer on 21/10/2014 from Friedrich Klumpp GmbH, Singapore.

vi) Quality Assurance Scheme followed by the Certificate holder for process control. Quality Assurance Plan followed is shown in Annex. I

3.2 Laboratory Tests Performed for Assessment

3.2.1 *Testing of Samples by Foreign Laboratory by KLUMPP, Singapore*

3.2.1.1 *Floor finish -- Natural*

Sr .No.	Test	Intl. Standard	Result
1.	Gloss value	DIN EN ISO 2813	33-34%
2.	Cross cut test	DIN EN ISO 2409	GT 0
3.	Abrasion resistance	DIN EN 438-2 (500g load per wheel S 33)	Initial point -- 260 cycle
4.	Abrasion resistance	ASTM D 4060 (500g load per wheel CS 17)	Initial point > 15000 cycle
5.	Scratch resistance-- pencil hardness	ISO 15184	7 H
6.	Scratch resistance- Coin test	Hamburger planner	39 N
7.	Scratch resistance- Surface	Steel wool test, Type 2	No scratch
8.	Impact resistance	DIN EN 438 Part 2-12	3 N
9.	Resistance to indentation	DIN EN 438 Part 2-14	2 N
10.	Chemical resistance	DIN 68861 -1:2011	5
11.	Heat resistance (cigarette test)	DIN 68861 -6:2011	6A
12.	**I**nflammability	DIN 4102- 14:1990	B1

3.2.1.2 *Floor finish – Carbonized*

Sr. No.	Test	Intl. Standard	Result
1.	Gloss value	DIN EN ISO 2813	34-35%
2.	Cross cut test	DIN EN ISO 2409	GT 0
3.	Abrasion resistance	DIN EN 438-2 (500g load per wheel S 33)	Initial point -- 240 cycle
4.	Abrasion resistance	ASTM D 4060 (500g load per wheel CS 17)	Initial point > 15000 cycle
5.	Scratch resistance-- pencil hardness	ISO 15184	7 H
6.	Scratch resistance- Coin test	Hamberger planner	37 N
7.	Scratch resistance- Surface	Steel wool test, Type 2	No scratch
8.	Impact resistance	DIN EN 438 Part 2-12	3 N
9.	Resistance to indentation	DIN EN 438 Part 2-14	2 N
10.	Chemical resistance	DIN 68861 -1:2011	5
11.	Heat resistance (cigarette test)	DIN 68861 -6:2011	6A
12.	**I**nflammability	DIN 4102 –14:1990	B1

3.2.1.3 *Floor finish –Stain*

Sr. No.	Test	Intl. Standard	Result
1.	Gloss value	DIN EN ISO 2813	31-33%
2.	Cross cut test	DIN EN ISO 2409	GT 0
3.	Abrasion resistance	DIN EN 438-2 (500g load per wheel S 33)	Initial point -- 240 cycle
4.	Abrasion resistance	ASTM D 4060 (500g load per wheel CS 17)	Initial point > 15000 cycle
5.	Scratch resistance-- pencil hardness	ISO 15184	7 H
6.	Scratch resistance- Coin test	Hamberger planner	39 N
7.	Scratch resistance- Surface	Steel wool test, Type 2	No scratch
8.	Impact resistance	DIN EN 438 Part 2-12	3 N
9.	Resistance to indentation	DIN EN 438 Part 2-14	2 N
10.	Chemical resistance	DIN 68861 -1:2011	5
11.	Heat resistance (cigarette test)	DIN 68861 -6:2011	6A
12.	**I**nflammability	DIN 4102 –14:1990	B1

3.2.1.4 *Floor finish –Wall*

Sr. No.	Test	Intl. Standard	Result
1.	Gloss value	DIN EN ISO 2813	34-35%
2.	Cross cut test	DIN EN ISO 2409	GT 0
3.	Abrasion resistance	DIN EN 438-2 (500g load per wheel S 33)	NA
4.	Abrasion resistance	ASTM D 4060 (500g load per wheel CS 17)	NA
5.	Scratch resistance-- pencil hardness	ISO 15184	7 H
6.	Scratch resistance- Coin test	Hamberger planner	40 N
7.	Scratch resistance- Surface	Steel wool test, Type 2	No scratch
8.	Impact resistance	DIN EN 438 Part 2-12	3 N
9.	Resistance to indentation	DIN EN 438 Part 2-14	2 N
10.	Chemical resistance	DIN 68861 -1:2011	5

11.	Heat resistance (cigarette test)	DIN 68861 -6:2011	6A
12.	**I**nflammability	DIN 4102 Part 14	B1

3.2.1.5 *Lifetime finishing*

Sr. No.	Test	Intl. Standard	Result
1.	Gloss value	DIN EN ISO 2813	35-37%
2.	Cross cut test	DIN EN ISO 2409	GT 0
3.	Abrasion resistance	DIN EN 438-2 (500g load per wheel S 33)	IP 1000 cycle FP1200 cycle
4.	Abrasion resistance	ASTM D 4060 (500g load per wheel CS 17)	Initial point > 30000 cycle
5.	Scratch resistance-- pencil hardness	ISO 15184	4H
6.	Scratch resistance-Coin test	Hamberger planner	35 N
7.	Scratch resistance-Surface	Steel wool test, Type 2	No scratch/ no marking
8.	Resistance to indentation	DIN EN 438 Part 2-14	≥ 2 N
9.	Chemical resistance	DIN 68861 -1:2011	No visible change(except black/blue ink)
10.	Heat resistance	EN 12722:1997	120ºC / Rating 5
11.	**I**nflammability	DIN 4102-14:1990	B1

3.2.1.6 *Standard finishing*

Sr. No.	Test	Intl. Standard	Result
1.	Gloss value	DIN EN ISO 2813	37-39%
2.	Cross cut test	DIN EN ISO 2409	GT 0
3.	Abrasion resistance	DIN EN 438-2 (500g load per wheel S 33)	IP - 140 cycle FP-170 cycle
4.	Abrasion resistance	ASTM D 4060 (500g load per wheel CS 17)	Initial point > 6000 cycle
5.	Scratch resistance-- pencil hardness	ISO 15184	3H
6.	Scratch resistance- Coin test	Hamberger planner	30 Newton
7.	Scratch resistance-Surface	Steel wool test, Type 2	No scratch/ no marking
8.	Resistance to indentation	DIN EN 438 Part 2-14	>= 2 Newton
9.	Chemical resistance	DIN 68861 -6:2011	No visible change(except black/blue ink)
10.	Heat resistance	EN 12722:1997	120ºC / Rating 5
11.	**I**nflammability	DIN 4102--14:1990	B1

3.2.2 *Testing of Samples by Centre for Testing & Evaluation of Wood Composites, IPIRTI, Bangalore*

3.2.2.1 *Test to determine the formaldehyde content in the board by Perforator method as per IS 13745:1993*

i) Type of the board : Bamboowood flooring tile
ii) Thickness of the board : 14.18mm
iii) Moisture content at the time of testing :5.52%
iv) Bulk density : 1031.10 kg/m^3
v) Perforator value : 13.88 mg/100g of oven dry board

3.2.2.2 *Test to determine the mechanical properties*

S. No.	Tests	Indian Standard	Result
1.	Density	IS 1708 (Part 2 & 5):1986	*1156.9 kg/m^3*
2.	Modulus of rupture	IS 1708 (Part 2 & 5):1986	*205.2 N/mm^2*
3.	Modulus of elasticity	IS 1708 (Part 2 & 5):1986	*23216 N/mm^2*
4.	Flammability (time taken for second ignition)	IS 1734 (Part 3):1983	*5 min.*
5.	Flame penetration (time taken for flame penetration from bottom to top surface)	IS 1734 (Part 3):1983	*38 min.*
6.	Rate of burning (time taken to lose weight from 70% to 30%)	IS 1734 (Part 3):1983	*11 min.*
7.	Thermal conductivity	IS 3346:1980	*0.354 W/m-K*

3.2.2.3 *Test to determine the Termite, Borer and Mould attack*

Termite test	Borer test	Mould test	Results		
			Termite	Borer	Mould
Samples were exposed for termite attack near mound for six months	Samples were exposed in plastic boxes for borer attack for three months	Samples were exposed in Incubation chamber for three months	No termite attack was noticed	No borer attack was noticed	Surface mould attack was noticed

3.3 Usage of the System

3.3.1 Sample of the Epitome Bamboowood products supplied by the manufacturer for Used as flooring, cladding, decking, furniture, bamboowood structures in buildings, houses, offices etc. is given below: -

Sr. No.	Agency	Location	Quantity	Products
1.	Social Forestry Range, Dept. of Forest	Govt. of Tripura	56.46 sqm	Flooring
2.	H Q, BSF	Tripura	28.50 sqm	Flooring
3.	NIT	Agartala	116.17sqm 357.81sqm	Flooring & cladding
4.	P L Raju Const. Ltd.	Karnataka	72 sqm	Flooring
5.	S T Enterprises	Arunachal Pradesh	212.39 sqm	Ceiling
6.	IHHR Hospitality Andhra Pvt Ltd	Hyderabad	525 sqm	Decking
7.	ONGC Ltd	Agartala	1700 pcs	Furniture
8.	Asian Construction Company	Mumbai	108 pcs	Door
9.	Digha, Project of World Bank & Govt. of West Bengal	Digha	9456 sqm	Structure for 1113 Vendor Kiosk

PART 4 STANDARD CONDITIONS

This certificate holder shall satisfy the following conditions:

4.1 The certificate holder shall continue to have the product reviewed by BMBA.

4.2 The product shall be continued to be manufactured according to and in compliance with the manufacturing specifications and quality assurance measures which applied at the time of issue or revalidation of this certificate. The Scheme of Quality Assurance separately approved shall be followed.

4.3 The quality of the product shall be maintained by the certificate holder. Complete testing facilities shall be installed for in-process control.

4.4 The product user should install, use and maintain the product in accordance with the provisions in this Certificate.

4.5 This certificate does not cover uses of the product outside the scope of this appraisal.

4.6 The product is appraised against performance provisions contained in the standards listed in Part-V. Provisions of any subsequent revisions or provisions introduced after the date of the certificate do not apply.

4.7 Where reference is made in this Certificate to any Act of Parliament of India, Rules and Regulations made there under, statutes, specifications, codes of practice, standards etc. of the Bureau of Indian Standards or any other national standards body and the International Organization for Standardization (ISO), manufacturer's company standards, instruction/manual etc., it shall be construed as reference to such publications in the form in which they were in force on the date of grant of this Certificate (and indicated in Part V to this Certificate)

4.8 The certificate holder agrees to inform BMBA of their clients with details of construction on six monthly basis.

4.9 The certificate holder agrees to provide to BMBA feedback on the complaints received, the redressal provided, and the time taken to provide redressal on complaint to complaint basis as soon as redressal is provided. BMBA agrees to provide the certificate holder the user feedback received by it, if any.

4.10 If at any time during the validity period, PACH is unable to fulfill the conditions in his PAC, he should on his own initiative suspend using the PAC and notify Chairman, TAC the date from which he has suspended its use, the reason for suspension and the period by which he will be able to resume. He shall not resume without the prior permission of BMBA. He shall also inform, simultaneously, his agents, licensees, distributors, institutional, government, public sector buyers, other buyers and all those whom he has informed about his holding the PAC. He shall also inform all those who buy his product(s) during the period of suspension. He shall provide to BMBA at the earliest the list of who have been so informed by him.

4.11 In granting this Certificate, BMBA takes no position as to:

(a) The presence or absence of patent or similar rights relating to the product;

(b) The legal right of the Certificate holder to market, install or maintain the product;

(c) The nature of individual installations of the product, including methods of workmanship.

4.12 BMTPC and the Board of Agreement of BMTPC (BMBA) take no position relating to the holder of the Performance Appraisal Certificate (PACH) and the users of the Performance Appraisal Certificate (PAC) respecting the patent rights / copy rights asserted relating to the product / system / design / method of installation etc. covered by this PAC. Considerations relating to patent / copy rights are beyond the scope of the Performance Appraisal Certification Scheme (PACS) under which this PAC has been issued. PACH and users of this PAC are expressly advised that determination of the Claim / validity of any such patent rights / copy rights and the risk of infringement of such rights are entirely the responsibility of PACH on the one hand and that of the users on the other.

4.13 It should be noted that any recommendations relating to the safe use of the product which are contained or referred to in this Certificate are the minimum standards required to be met with when the product is installed, used and maintained. They do not purport in any way to restate or cover all the requirements of related Acts such as the Factory Act, or of any other statutory or Common Law duties of care, or of any duty of care which exist at the date of this Certificate or in the future, nor is conformity with the provisions of this Certificate to be taken as satisfying the requirements of related Acts.

4.14 In granting this Certificate, BMTPC and BMBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the use of this product.

4.15 The certificate holder indemnifies BMBA, its officers and officials involved in this assessment against any consequences of actions taken in good faith including contents of this certificate. The responsibility fully rests with the certificate holder and user of the product.

4.16 The responsibility for conformity to conditions specified in this PAC lies with the manufacturer who is granted this PAC. The Board (BMBA) will only consider requests for modification or withdrawal of the PAC.

4.17 The PAC holder shall not use this certificate for legal defense in cases against him or for legal claims he may make from others.

Place: New Delhi
Date of issue: 24.04.2015

Chairman TAC & for and on behalf of
Member Secretary, BMBA
Dr. Shailesh Kr. Agrawal
Chairman, TAC
& Member Secretary, BMBA
Building Materials and Technology Promotion Council
Ministry of Housing and Urban Affairs, Govt. of India
Core 5A, 1st Floor, India Habitat Centre
Lodhi Road, New Delhi-110003

PART 5 LIST OF STANDARDS & CODES USED IN ASSESSMENT

5.1 Standards - These Standards are referred for carrying out particular tests only and do not specify the requirement for the whole product as such.

5.1.1 IS 1708 (Part 1):1986 – Method of testing of small clear specimens of timber – Determination of moisture content
5.1.2 IS 1708 (Part 2):1986 – Method of testing of small clear specimens of timber – Determination of specific gravity
5.1.3 IS 1708 (Part 5):1986 -- Method of testing of small clear specimens of timber – Determination of static bending strength
5.1.4 IS 1708 (Part 10):1986 – Method of testing of small clear specimens of timber– Determination of hardness under static indentation
5.1.5 IS 1734 (Part 3):1983 -- Methods of test for plywood – Determination of fire resistance
5.1.6 IS 2380:1981 -- Method of test for wood particle boards and boards from other lignocellulosic materials
5.1.7 IS 3346:1980 - Method of determination of thermal conductivity of thermal insulation materials
5.1.8 IS 13745:1993--Methods of determination of formaldehyde content in wood particle board by perforator method
5.1.9 DIN EN ISO 2409:2007 – Test method for determination of Cross cut adhesion tape
5.1.10 DIN EN ISO 2813:1994 – Test method for determination of specular gloss of paint film using a reflectometer
5.1.11 DIN EN 438-2:1991 – Test method for determination of Abrasion resistance:
5.1.12 DIN EN 438 (Part 2 -12):2005 – Test method for determination of Impact resistance by impactor drop ball test
5.1.13 DIN EN 438 (Part 2 -14):2005 – Test method for determination of Resistance to indentation (water vapour)
5.1.14 DIN 4102 (Part 14):1990 – Floor covering systems using a radiant heat source
5.1.15 DIN 68861-1:2011 – Test method for determination of behavior at Chemical influence
5.1.16 DIN 68861-6:2011 – Test method for determination of behavior at glowing cigarette
5.1.17 ASTM D 1037:2006 – Standard rest method for evaluating properties of wood based fiber and particle panel materials
5.1.18 ASTM D 4060-10:1995 – Standard **t**est method for Abrasion resistance of organic coating by Taber Abraser tester
5.1.19 ASTM D 4442:2007 -- Standard **t**est method for direct moisture content measurement of wood & wood base materials
5.1.20 ISO 15184:2012 -- Determination of film hardness by pencil test
5.1.21 EN 12722:1997 – Furniture—assessment of surface resistance by dry heat

5.2 Company Standards of the PAC Holder – The branded design & specifications of the raw materials and finished product are as submitted by the manufacturer. The PAC holder has to make available the company standards to the consumers according to which testing have been done.

CERTIFICATION

In the opinion of Building Materials & Technology Promotion Council's Board of Agreement (BMBA), **Bamboowood Products** bearing the mark manufactured by M/s Mutha Industries Pvt. Ltd is satisfactory if used as set out above in the text of the Certificate. This Certificate **PAC No. 1017-P/2015** is awarded to **M/s Mutha Industries Pvt. Ltd., Mumbai.**

The period of validity of this Certificate is for a period of two years i.e. from **24.04.2025** to **23.04.2027** as shown on Page 1 of the PAC.

This Certificate consists of a cover page and pages 1 to 53.

Dr. Shailesh Kr. Agrawal
Chairman, TAC
& Member Secretary, BMBA
Building Materials and Technology Promotion Council
Ministry of Housing and Urban Affairs, Govt. of India
Core 5A, 1st Floor, India Habitat Centre
Lodhi Road, New Delhi-110003

Embossing Seal of BMBA

On behalf of BMTPC Board of Agreement, Chairman, Technical Assessment Committee (TAC) of BMBA & Member Secretary, BMTPC Board of Agreement (BMBA) Under Ministry of Housing and Urban Affairs, Government of India

Place: New Delhi, India

Date: 02.06.2025

PART 6 ABBREVIATIONS

Abbreviations

BMBA	Board of Agreement of BMTPC
BMTPC	Building Materials and Technology Promotion Council
CPWD	Central Public Works Department
ED	Executive Director of BMTPC
IO	Inspecting Officer
MS	Member Secretary of BBA
PAC	Performance Appraisal Certificate
PACH	PAC Holder
PACS	Performance Appraisal Certification Scheme
SQA	Scheme of Quality Assurance
TAC	Technical Assessment Committee (of BMBA)

PERFORMANCE APPRAISAL CERTIFICATION SCHEME - A BRIEF

Building Materials & Technology Promotion Council (BMTPC) was set up by the Government of India as a body under the Ministry of Housing &Urban Poverty Alleviation to serve as an apex body to provide inter-disciplinary platform to promote development and use of innovative building materials and technologies laying special emphasis on sustainable growth, environmental friendliness and protection, use of industrial, agricultural, mining and mineral wastes, cost saving, energy saving etc. without diminishing needs of safety, durability and comfort to the occupants of buildings using newly developed materials and technologies.

During the years government, public and private sector organizations independently or under the aegis of BMTPC have developed several new materials and technologies. With liberalization of the economy several such materials and technologies are being imported.

However, benefits of such developments have not been realized in full measure as understandably the ultimate users are reluctant to put them to full use for want of information and data to enable them to make informed choice.

In order to help the user in this regard and derive the envisaged social and economic benefits the Ministry of Housing &Urban Poverty Alleviation has instituted a scheme called Performance Appraisal Certification Scheme (PACS) under which a Performance Appraisal Certificate (PAC) is issued covering new materials and technologies. PAC provides after due investigation, tests and assessments, amongst other things information to the user to make informed choice.

To make the PACS transparent and authentic it is administered through a Technical Assessment Committee
(TAC) and the BMTPC Board of Agreement (BMBA) in which scientific, technological, academic, professional organizations and industry interests are represented.

The Government of India has vested the authority for the operation of the Scheme with BMTPC through Gazette Notification No. 1-16011/5/99 H-II in the Gazette of India No. 49 dated 4th December, 1999.

Builders and construction agencies in the Government, public and private sectors can help serve the economic, development and environmental causes for which the people and Government stand committed by giving preference to materials and technologies which have earned Performance Appraisal Certificates.

Further information on PACS can be obtained from the website: www.bmtpc.org

ANNEX I

(Clause 1.6.3)

BUILDING MATERIALS & TECHNOLOGY PROMOTION COUNCIL

Quality Assurance Plan for Bamboowood Products

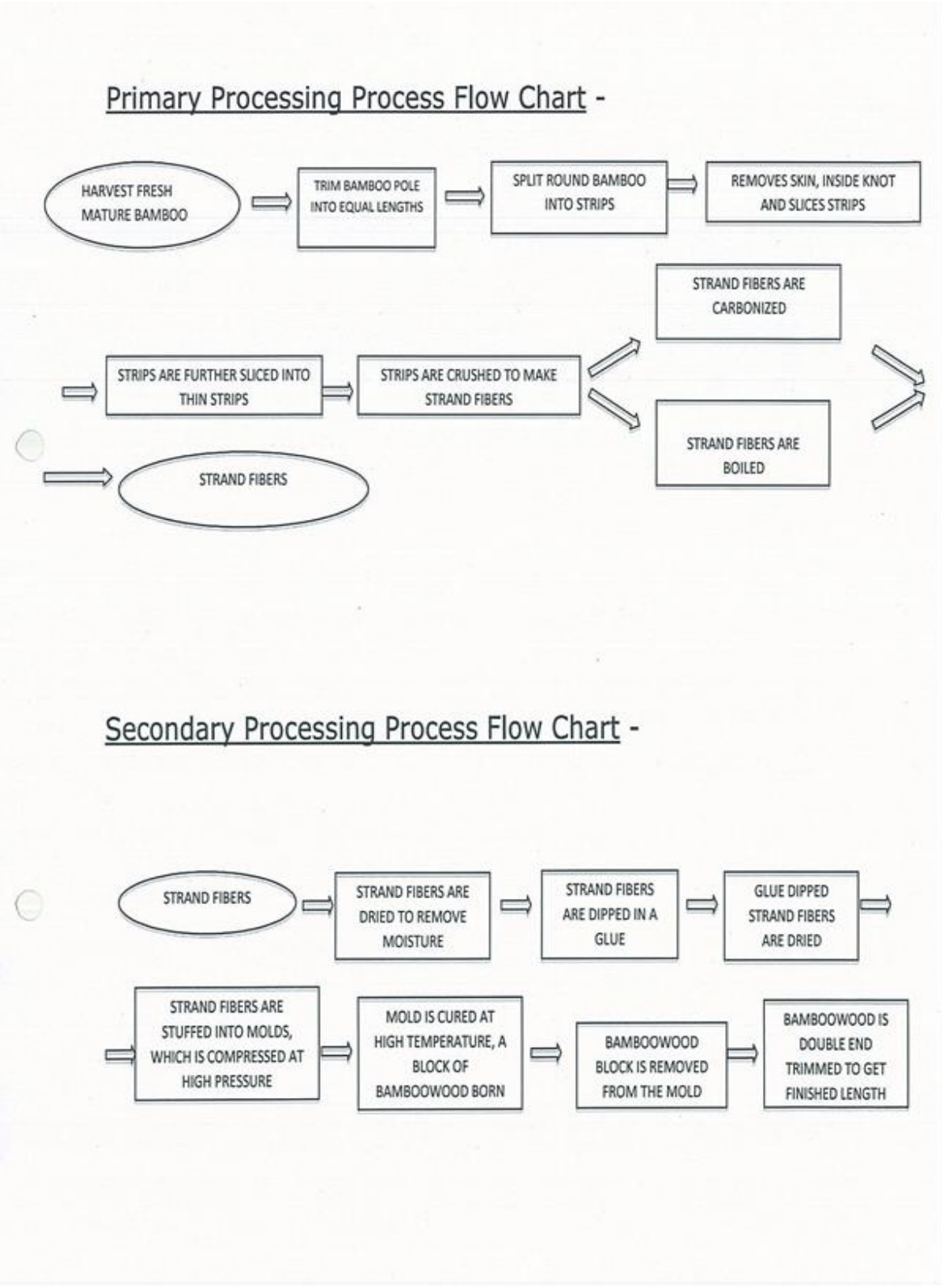
S. No.	Parameters to be inspected	Requirement Specified	Test Method	Frequency of Testing
I.	**Bamboowood Routine Test**			
1.	Raw Bamboo Inspection	Freshly harvested	Physical & measured	Daily/load basis
2.	Raw Material General	As per material quality report	Physical & measured	Daily/load basis
II.	**Phenol Formaldehyde Resin Routine Test**			
1.	Specific gravity	1.14-1.15	Sp. Gr. meter	Every charge basis
2.	Flow time	20-30 sec	B-4 Cup	Every charge basis
3.	Ph	10 -11.5	Ph digital meter	Every charge basis
4.	Solid content	42 - 50%	Oven dry method	Every charge basis
III.	**Flooring**			
	Routine Test			
1.	Density	≥ 1100 Kg/m^3	IS 1708 (Part 2): 1986	Weekly
2.	Modulus of Rupture (MOR)	≥ 150 N/mm^2	IS 1708 (Part 5): 1986	Weekly
3.	Modulus of Elasticity (MOE)	≥ 17500 N/mm^2	IS 1708 (Part 5): 1986	Weekly
4.	Hardness Test	≥ 800 Kg	IS 1708 (Part 10): 1986/ASTM D 1037	Weekly
5.	Moisture Content (oven dry method)	≤ 12%	IS 1708 (Part 1): 1986/ASTM D 4442	Weekly
	Type Test			
1.	Thermal Conductivity	≤ 0.50 W/m-K	IS 3346:1980	Half yearly/ yearly/ need basis
2.	Volatile organic compound (oven dry method)	≤ 6.00 mg/100g	IS13745:1993	Half yearly/ yearly/ need basis
3.	Termite test	No termite attack	Lab test--6 months in termite mound	Yearly/ need basis
4.	Borer test	No borer attack	Lab test -- 3 months in borer box	Yearly/ need basis
5.	Flame penetration	≥ 30 min	IS 1734 (Part 3) : 1983	Yearly/ need basis
6.	Water absorption	≤ 4% (2 hrs),	IS 2380:1981	Weekly

		≤ 8% (24 hrs)		
7.	Swelling due to general absorption	≤ 8%	IS 2380:1981	Weekly
8.	Swelling due to surface absorption	≤ 4% (2 hrs), ≤ 8% (24 hrs)	IS 2380:1981	Weekly
9.	Screw withdrawal resistance (Flat face)	≥ 250 Kg	IS 2380:1981	Weekly
10.	Screw withdrawal resistance (Edge)	≥ 200 Kg	IS 2380:1981	Weekly
11.	Flammability	≥ 5 min	IS 1734 (Part 3) : 1983	Yearly/ need basis
12.	Rate of burning	≥ 10 min	IS 1734 (Part 3) : 1983	Yearly/ need basis
IV. Flooring Finish				
	Routine Test			
1.	Gloss value	30 ± 5%	DIN EN ISO 2813	Daily/load basis
2.	Scratch resistance	No scratch	Coin test	Daily/load basis
3.	Heat resistance (Cigarette test)	6A	DIN 68861 Part 6	Daily/load basis
	Type Test			
1.	Cross cut test	≤ GT 2	DIN EN ISO 2409	Half yearly/ yearly/ need basis
2.	Scratch resistance (Coin test)	≥ 20 N	Hamburger planner	Half yearly/ yearly/ need basis
3.	Abrasion resistance	IP > 100 cycle	DIN EN 438-2 (500 g load per wheel S 33)	Half yearly/ yearly/ need basis
4.	Abrasion resistance	IP > 6000 cycle	ASTM D 4060 (500 g load per wheel CS 17)	Half yearly/ yearly/ need basis
5.	Scratch resistance (pencil hardness)	≥ 1H	ISO 15184	Half yearly/ yearly/ need basis
6.	Scratch resistance (surface)	No scratch	Steel wool test, Type 2	Half yearly/ yearly/ need basis
7.	Impact resistance	≥ 2 N	DIN EN 438 Part 2-12	Half yearly/ yearly/ need basis
8.	Resistance to indentation	≥ 1 N	DIN EN 438 Part 2-14	Half yearly/ yearly/ need basis
9.	Chemical resistance	5	DIN 68861 Part 1	Half yearly/ yearly/ need basis
10.	Inflammability	B1	DIN 4102 Part 14	Half yearly/ yearly/ need basis

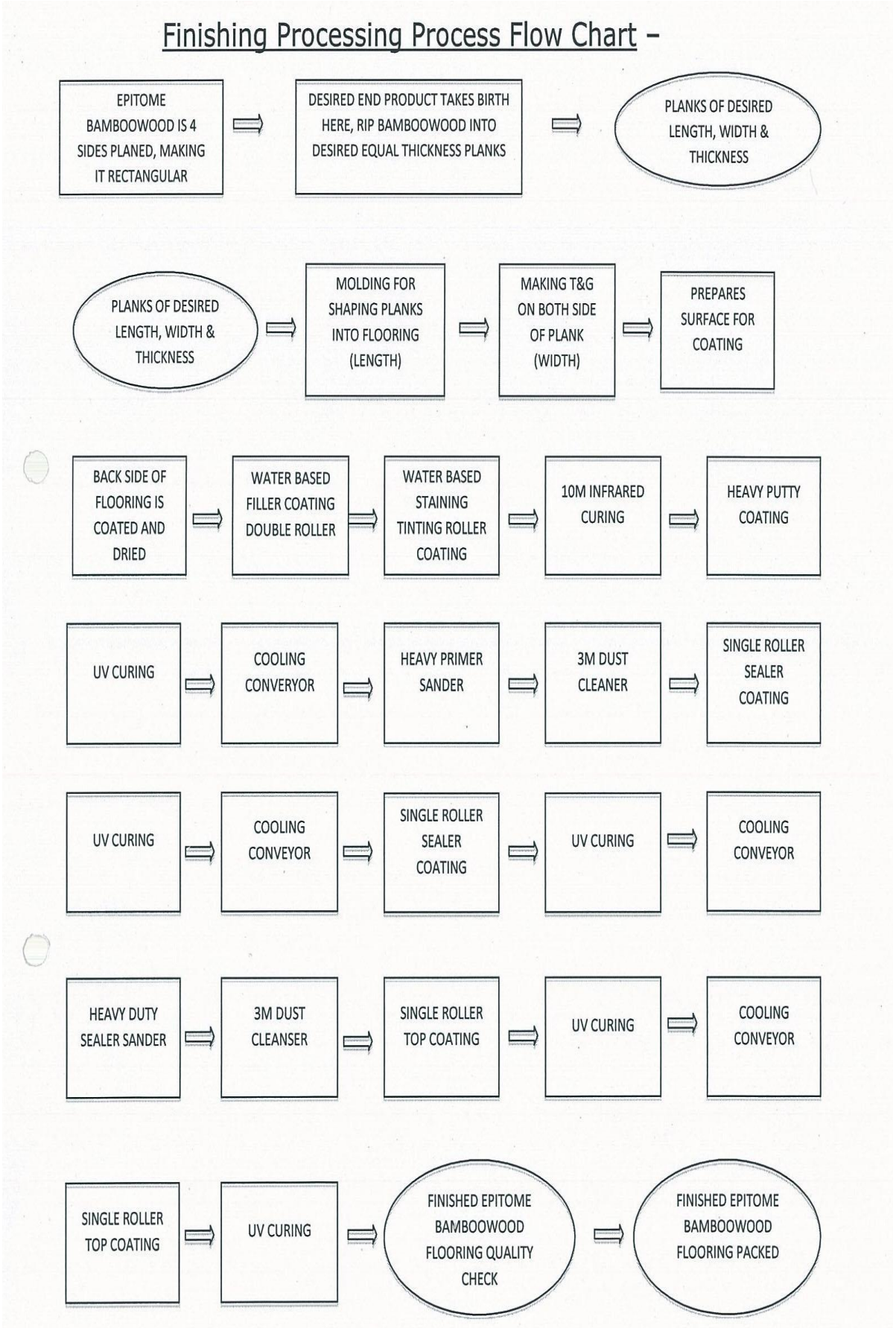
ANNEX II

(*Clause 1.3.1.4)*

PROCESS FLOW CHART

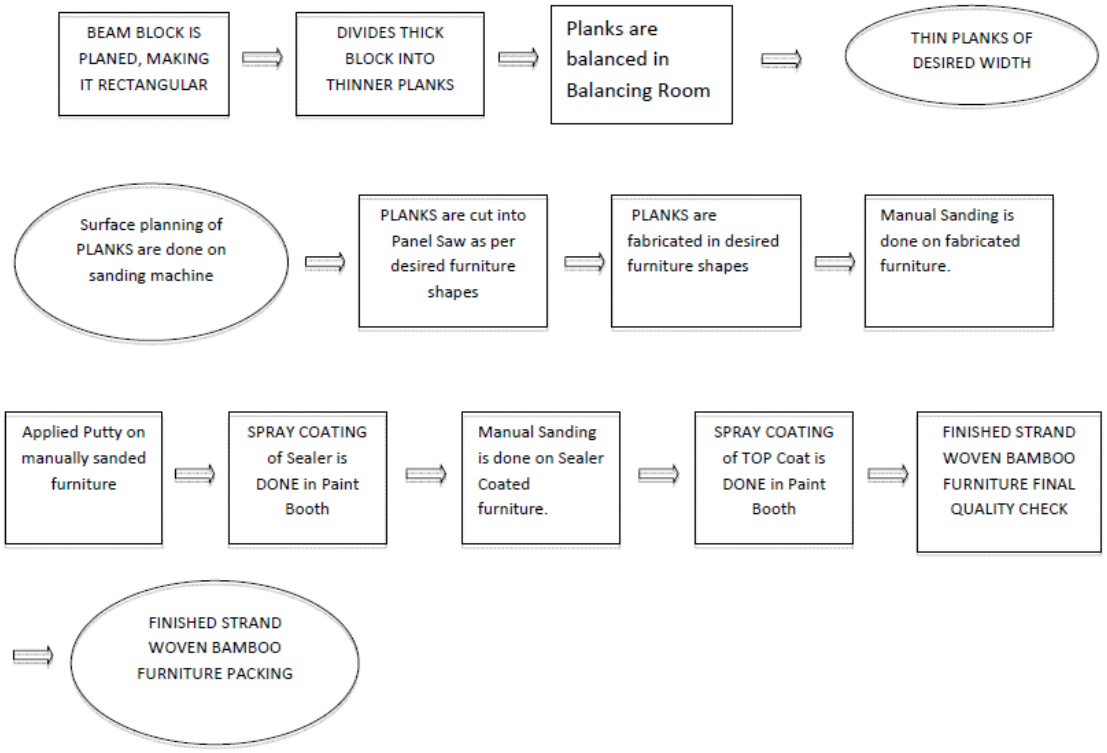


Finishing Processing Process Flow Chart –



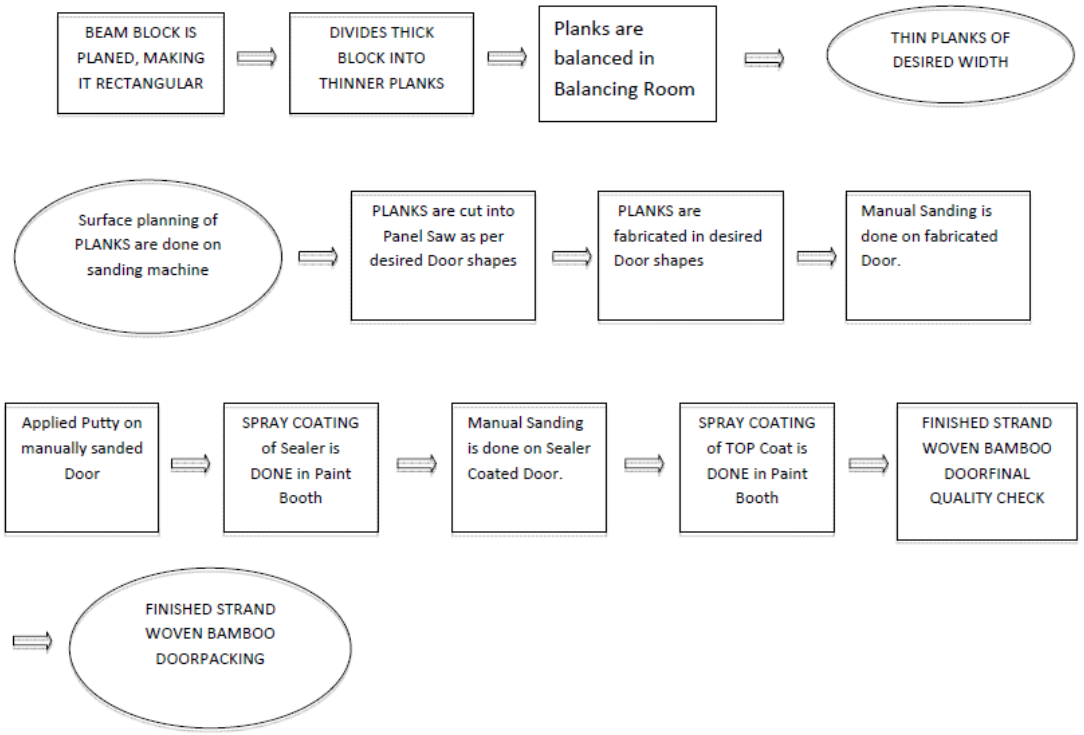
12.3. **Bamboo wood Furnitures:**

12.3.1. a. Machining Flow Chart



13.3. Bamboo wood Doors:

13.3.1. a. Machining Flow Chart



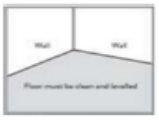
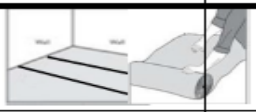
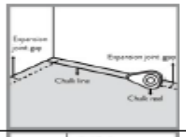
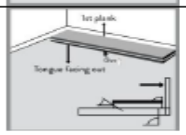
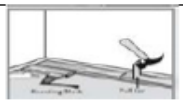
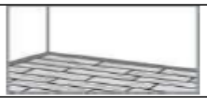
ANNEX III

(Clause 2.3.5)

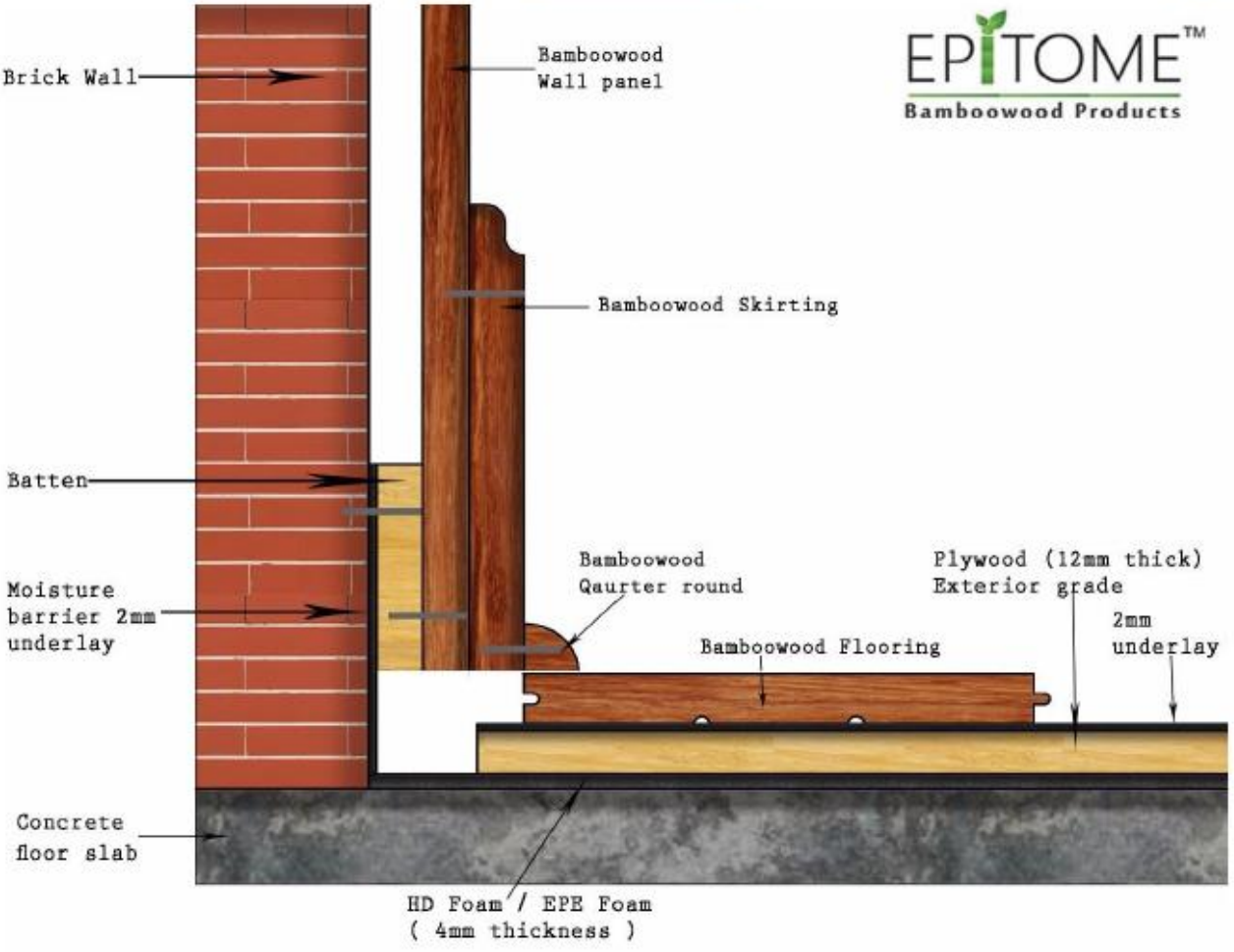
INSTALLATION PROCEDURE

EPITOME™ Bamboowood Products

FLOATING FLOOR INSTALLATION

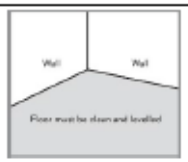
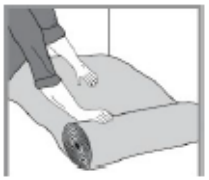
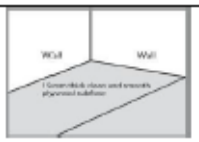
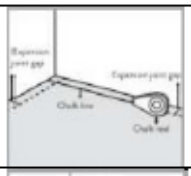
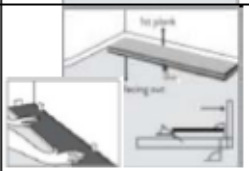
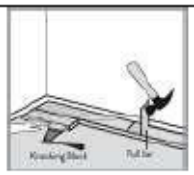
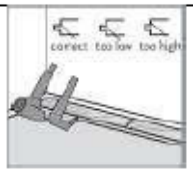
1		► CHECK FLOORING AREA DRIED WELL ► MAXIMUM FLOOR MOISTURE CONTENT 12% ALL CIVIL, PLUMING, ELECTIRCAL, PAINTING, OTHER WORKS COMPLETED ► CLEAN FLOORING AREA WELL
2		1ST USE 2mm thick UNDERLAY AS MOISTURE BARRIER SHEET FOIL SIDE TOUCHING DOWN TO CONCRETE AND CUSHION SIDE UP ► DONOT OVERLAP THE SHEET, USE TAPE TO JOIN TWO SHEETS
3		4mm thick HIGH DENSITY EPE (expanded polyethylene) FOAM OVERLAY ACROSS TO UNDERLAY AS BARRIER, SOUND ABSORBER AND LEVELING FOAM ► UNROLL THE SHEET ON THE LONGEST WALL ► USE TAPE TO JOIN TWO SHEETS TO STOP OVERLAPPING OF SHEETS
4		► MARK GUIDELINE FOR RIGHT ANGLE IN X – Y DIRECTIONS ► USE EXPANSION GUIDE STRIPS BEHIND RIGHT ANGLE GUIDELINES ► KEEP EXPANSION GAP 15mm SIDESWAYS AND 6mm AT ENDS ► CHECK ESSENTIAL HAND TOOL PAGE FOR CORRECT EXPANSION STRIP SIZE
5		SPREAD FLOOR TILES TO ACCLIMATIZE / NORMALIZE FOR 72hours COLOUR SORTING SHALL DO PRIOR TO START INSTALLATION PLACE GUIDE TILE IN RIGHT ANGLE AS PER Sl. No. 4 ► START INSTALLTION OF TILES FROM LONGEST WALL
6		► CHOICE OF DESIGN RESULT IN HIGHER WASTAGES ► CHECK MATERIAL QUANTITY IN ADVANCE AS PER YOUR DESIGN ► ARRANGE START PLACING TILES IN REGULAR DESIGN FORM ► (MOST ECONOMICAL)
7		APPLY THIN LAYER OF D-3 CATEGORY ADHESIVE TO LOCK TWO TILES SPREAD ADHESIVE ON TOUNGE AS SHOWN IN PICTURE USE POINTED NOSE BOTTLE TO SAVE WASTAGES ► THIS PROCESS SHALL CONTINUE AND REPEAT AGAIN & AGAIN ON ALL SIDES WHERE TOUNGE PRESENT
8		► ALIGN NEXT FLOOR TILE LOCK TWO TILES AS SHOWN IN LENGTH WAYS ► NEXT ONE (2nd line) CONTINUE SAME FOR NEXT FLOOR TILE END CUTTING FROM LAST TILES CAN COME HERE IN FIRST PLACE OF THIS
9		► PUSH TILES TO LOCK EACH OTHER WELL BY USING CONTROLLED FORCE CONTINUE LAY AND ALIGN FOOR TILES AND REPEAT LOCKING PROCESS
10		► REMOVE EXPANSION GUIDE STRIPS NOW WITHOUT FAIL ► PLACE SKIRTING & QUARTER ROUND AS PER SECTION DETAILS BELOW THERE SHOULD NOT BE ANY CONTACT BETWEEN FLOOR AND MOLDING OF ► ANY KIND AS SHOWN IN SECTIONZ
11		► ALLOW NEW FLOOR TO ACCLIMATIZE FOR 24 HOURS ► EPITOME BAMBOOWOOD FLOORING IS READY TO USE ► FOLLOW MAINTENANCE GUIDELINES FOR BEST RESULTS


BRICK WALL
QUARTER ROUND
SKIRTING
FLOORING PLANK
4MM UNDER
CONCRETE SLAB
4mm UNDERLAY
12mm PLYWOOD
2mm UNDERLAY


Brick Wall
Bamboowood
Wall panel
Bamboowood Skirting
Batten
Moisture
barrier 2mm
underlay
Bamboowood
Qaurter round
Plywood (12mm thick)
Exterior grade
2mm
underlay
Bamboowood Flooring
Concrete
floor slab
HD Foam / EPE Foam
(4mm thickness)

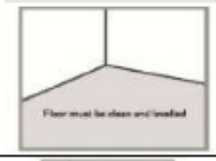
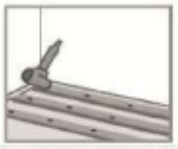
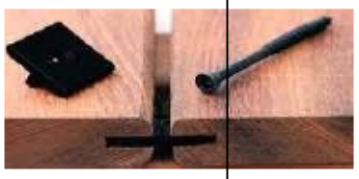
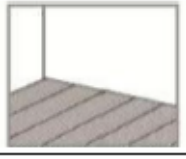
EPITOME™
Bamboowood Products

NAIL DOWN FLOOR INSTALLATION WITH 12mm PLYWOOD SUBFLOOR

1		▶ CHECK FLOORING AREA DRIED WELL ▶ MAXIMUM FLOOR MOISTURE CONTENT 12% ▶ ALL CIVIL, PLUMING, ELECTIRCAL, PAINTING, OTHER WORKS COMPLETED ▶ CLEAN FLOORING AREA WELL USE 2mm UNDERLAY AS MOISTURE BARRIER SHEET FOIL SIDE TOUGHING
2		▶ DOWN TO CONCRETE AND CUSHION SIDE UP DO NOT OVER LAP THE SHEET, USE TAPE TO JOIN TWO SHEETS ▶ If sub floor level is not zero than follow this --- otherwise skip this… ▶ 4mm thick HIGH DENSITY EPE (expanded polyethylene) FOAM OVERLAY ACROSS TO UNDERLAY AS BARRIER, SOUND ABSORBER AND LEVELING FOAM
3		▶ USE 12mm WATER RESISTANT ISI MARK PLYWOOD ABOVE UNDERLAY AS SUB BASE FLOOR FOR TILES ▶ NAIL DOWN TO PLYWOOD TO CONCRETE FLOOR MINIMUM 12 NAILS PER PLYWOOD
4		▶ MARK GUIDELINE FOR RIGHT ANGLE IN X – Y DIRECTIONS ▶ USE EXPANSION GUIDE STRIPS BEHIND RIGHT ANGLE GUIDELINES ▶ KEEP EXPANSION GAP 15mm SIDESWAYS AND 6mm AT ENDS ▶ CHECK ESSENTIAL HAND TOOL PAGE FOR CORRECT EXPANSION STRIP SIZE
5		▶ SPREAD FLOOR TILES TO ACCLIMATIZE / NORMALIZE FOR 72hours ▶ COLOUR SORTING SHALL DO PRIOR TO START INSTALLATION ▶ PLACE GUIDE TILE IN RIGHT ANGLE AS PER INSET PICTURE IN Sl. No. 5 ▶ START INSTALLTION OF TILES FROM LONGEST WALL
6		CHOICE OF DESIGN RESULT IN HIGHER WASTAGES ▶ CHECK MATERIAL QUANTITY IN ADVANCE AS PER YOUR DESIGN ARRANGE ▶ START PLACING TILES IN REGULAR DESIGN FORM (MOST ECONOMICAL) ▶ ALIGN FLOOR TILE LOCK TWO TILES AS SHOWN IN LENGTH WAYS ▶ END CUTTING FROM LAST TILES CAN COME HERE IN FIRST PLACE OF THIS
7		▶ USE PNEUMATIC FLOOR NAILER TO NAIL DOWN TILES ▶ USE BRAD NAILS FOR TILE TO PLYWOOD OF BR18G35 (35mm Long) ▶ CHECK AIR PRESSURE 7.5bar up or higher ▶ REPEAT Sl. No. 6 & 7 AGAIN AND AGAIN ▶ USE SECTION DETAIL AS DETAILED BELOW
8		▶ REMOVE EXPANSION GUIDE STRIPS NOW WITHOUT FAIL ▶ PLACE SKIRTING & QUARTER ROUND AS PER SECTION DETAILS BELOW
9		▶ ALLOW NEW FLOOR TO ACCLIMATIZE FOR 24 HOURS ▶ EPITOME BAMBOOWOOD FLOORING IS READY TO USE ▶ FOLLOW MAINTENANCE GUIDELINES FOR BEST RESULTS

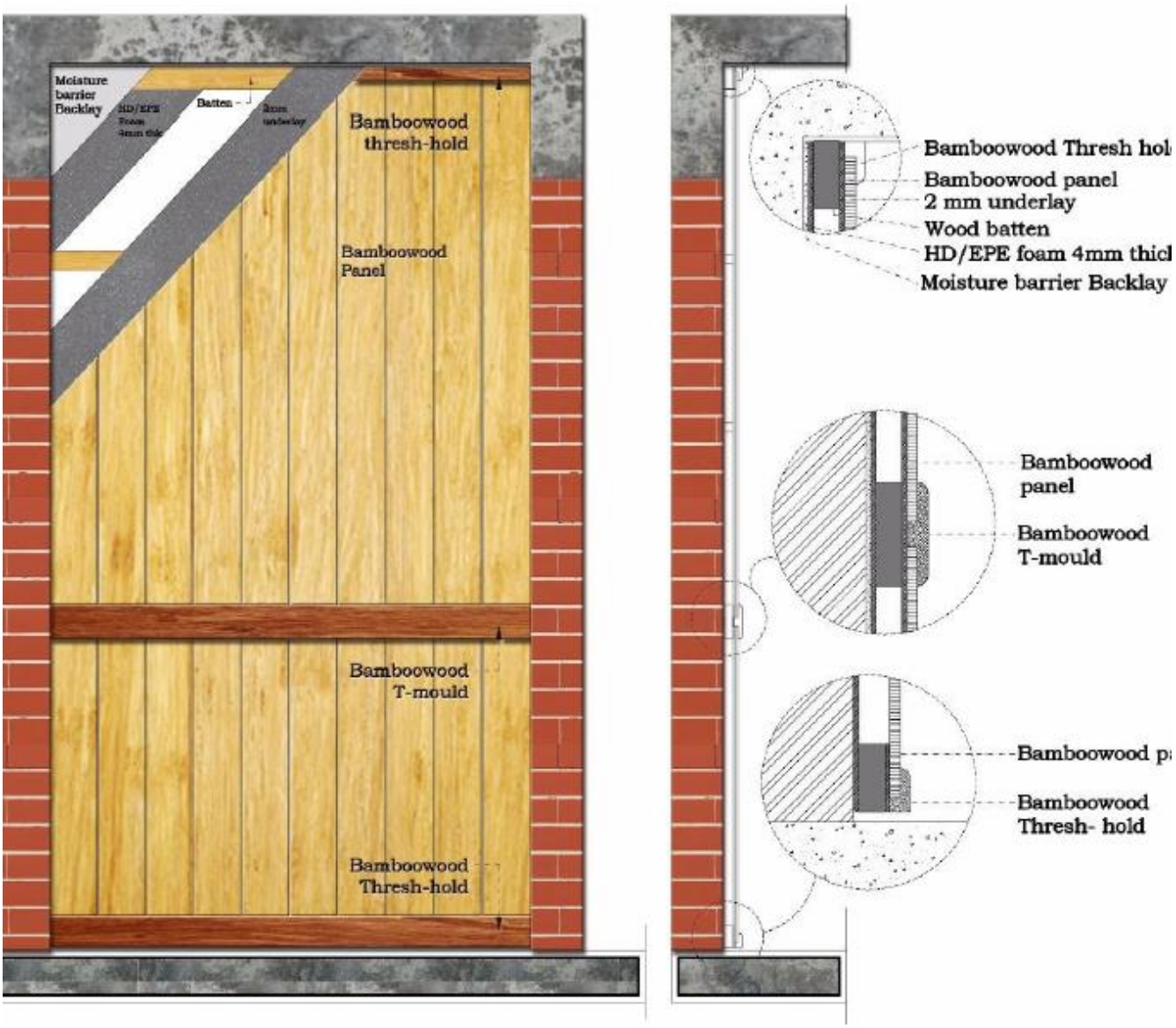
EPITOME™
Bamboowood Products

DECKING INSTALLATION

1		▶ CLEAN FLOOR
2		▶ PLACE BATTENS HARD WOOD OF MINIMUM SIZE 50X50MM WITH A GAP OF NOT MORE THAN 500MM BETWEEN THEM CENTRE TO CENTRE ▶ NAIL DOWN BATTEN INTO SUBFLOOR
3		INSTALL CLIP ON THE BACK OF DECK TILE BY2.5MM DIA AND 10MM LONG SCREW
4		▶ INSTALLATION OF FIRST DECK TILE ▶ 1ST DECK TILE NEED TO FIX AS GUIDE ▪ ONE CAN FIX BY DRILLING 2NOS OF HOLES; ▪ EACH HOLE 150MM INSIDE FROM BOTH ENDS ▪ NOW FIX 1ST DECK TILE WITH 4MM SCREW WITH BATTEN IN DOWN
5		▶ USE CLIP TO FIX THIS THIS TILE DOWN WITH BATTEN WITH 2.5MM SCREW ▶ FOLLOW SAME TO FIX ALL OTHER CLIPS TO BATTENS
6		KEEP MINIMUM 8MM EXPANSION GAP BETWEEN TWO DECK TILESUSE USE 8MM THICK EXPANSION STRIP ▶ KEEP CLIP IN CENTRE BETWEEN TWO DECK TILES ▶ FIX SCREWS THROUGH CLIP TO BATTEN TO HOLD NEXT TILE IN PLACE ▶ REPEAT SAME AGAIN AND AGAIN
7		▶ CONTINUE SAME FOR NEXT DECK TILES AND COMPLETE DECK ▶ NOTE – DO NOT PUT EXTRA PRESSURE ON SCREWS TO PUSH CLIP DOWN TIGHTEN SCREWS WITH GENTLE PRESSUE THIS WILL ALLOW DECK TO ACQUAINT WITH CHANGING ATMOSPHERE
8		▶ INSTALLATION DECK PICTURE WILL GIVE CLEAR IDEA FOR GAP BETWEEN TILES AND FITTING THROUGH IN
9		▶ CARRYOUT ONE TOP SIDE COAT POST INSTALLATION ▶ USE ROLLER COATER FOR SAME AND DO TIGHT COAT ▶ DO NOT LEAVE EXTRA OIL ON SURFACE ANYTIME
10		▶ ALLOW NEW DECK TO ACCLAMATIZE FOR 24HRS BEFORE START USING YOUR EPITOME BAMBOOWOOD DECK IS READY TO USE ▶ FOLLOW MAINTENANCE GUIDELINES FOR BEST RESULTS

CLADDING INSTALLATION

EPITOME™
Bamboowood Products



ANNEX IV
(Clause 2.4.3.3)
MAINTENANCE GUIDELINES

EPITOME®
Bamboowood Products

Maintenance Guideline - Interior Epitome Bamboowood Flooring

Every high-quality surface must be properly maintained to preserve its beauty. This program covers all requirement of daily wear and tear.

To maintain Epitome Bamboowood Floor, Any good quality hardwood floor cleaners are recommended to ensure your floor stays looking as good as when you purchased it.

Ensure the hardwood floor cleaner is a water-based, non-toxic cleaner which is specially designed for finished hardwood floors. Unlike all-purpose cleaners and oil soaps, it quickly cleans tough stains and spills from - drinks to scratch marks - without dulling your floor's beautiful finish or leaving any residue. Follow manufacturers instructions on cleaner.

1. DRY MOP

Always remove dirt and grit prior to cleaning your Eptiome Bamboowood floors with an electrostatic dust control mop/ soft broom/ Vacuum cleaner. Avoid using bristle broom.

2. DRY SPRAY

Lightly mist an area of your Epitome Bamboowood floor or directly mist the cleaning pad with your chosen Hardwood floor cleaner.

3. WIPE

Using a back and forth motion, clean the floor surface with a microfiber cloth or mop until dry. Replace a soiled mop or cloth when it becomes soiled to avoid streaking.


DRY CLEANING


WET CLEANING


MAINTENANCE


TOUCH UP & REPAIR

Do's

- *Clean your floor regularly. The care interval depends on wear & tear of the flooring. The following recommendation should be seen as a guide line:*

  For flooring

- *Low frequented area (residential areas) about every 2-4 weeks*
- *Medium frequented area (offices): about every 1 - 2 weeks*
- *High frequented area (public places) : about every 1 - 2 days*

- *Remove spills promptly.*
- *Place mats at exterior and interior doors to trap sand and grit from incoming traffic*
- *When moving heavy furniture or appliances always pick them up rather than sliding them across the floor*
- *Any minor scratches or damage can be repaired using hardwood flooring cleaners*

Don'ts

- *Do not steam mop or wet mop floor surface area after installation, excess water can cause swelling.*
- *Do not let sand, dirt or grit build up. They act like sandpaper and actually abrade and dull your floor finish*
- *Ensure water/liquid is not stagnant on the floor for a long duration.*
- *Protect your floor from leakage of any sort*

We hope these guidelines are helpful enough for you to enjoy Epitome Bamboowood flooring.

***

Maintenance Guideline - Interior Epitome Bamboowood Wall Cladding / Ceiling

Every high-quality surface must be properly maintained to preserve its beauty

To maintain Epitome Bamboowood Wall Cladding and Ceiling, any good quality "hardwood product cleaner" is recommended to ensure your cladding/ceiling stays looking as good as when you purchased it.

Ensure the hardwood cleaner is a water-based, non-toxic cleaner which is specially designed for finished hardwood products, Unlike all-purpose cleaners and oil soaps. It quickly cleans tough stains, spills from drinks, scratch marks - without dulling your ceiling/cladding beautiful finish or leaving any residue.

For maintenance of Cladding and Ceiling please follow manufacturers instruction:

1. DRY MOP

Always remove dirt and grit prior to cleaning your Epitome Bamboowood product with an electrostatic dust control mop/ soft broom. Avoid using bristle broom.

2. DRY SPRAY

Lightly mist an area of your Epitome Bamboowood products or directly mist the cleaning pad with your chosen Hardwood product cleaner.

3. WIPE

Using a back and forth motion, clean the surface with a microfiber cloth or mop until dry. Replace a soiled mop or cloth when it becomes soiled to avoid streaking.

DRY CLEANING

WET CLEANING

MAINTENANCE

TOUCH UP & REPAIR

Do's

- *Clean your Epitome Bamboowood Product regularly. The care interval depends on wear & tear of the product. The following recommendation should be seen as a guide line:*
- *Clean once every 4-8 weeks*
- *Any minor scratches or damage can be repaired using hardwood product cleaners*

Don'ts

- *Do not steam mop or wet mop the surface area after installation, excess water can cause swelling.*
- *Do not let sand, dirt or grit build up. They act like sandpaper and actually abrade and dull your floor finish*
- *Ensure water/liquid is not stagnant on the surface of the product for a long duration.*
- *Protect your wall/ceiling from leakage of any sort*

We hope these guidelines are helpful enough for you to enjoy Epitome Bamboowood products.

***

Maintenance Guidelines – Exterior Epitome Bamboowood Cladding

Every high quality surface must be properly maintained to preserve its beauty
Epitome Bamboowood Outdoor Cladding require regular maintenance
Epitome Bamboowood Outdoor Cladding need to be maintained as per supplier's guidelines

Maintenance Required at Interval of

- *At the end of every season (Monsoon, Winter, Summer) in the first year*
- *Half yearly in second and third year*
- *Yearly thereafter and onwards*

DO'S

- *Regularly maintain your exterior cladding as per manufacturer's advice.*
- *The care interval depends on wear & tear.*

DONT'S

- *Do not leave your exterior cladding without proper maintenance*

Follow manufacturer's instructions at all times.

Procedure for maintenance of Epitome Bamboowood Outdoor Cladding:

Choose a nice sunny day to clean your Epitome Outdoor Cladding, wear suitable clothing and gloves for safety. Start by spraying water with high pressure and clean the deck for removal of all dust, leaves etc.

Use Exterior Cleaner for outdoor cladding. Rub the edges well.

After thorough cleaning of the surface, wash the surface again with high pressure water.

Let the surface dry in natural sunlight (minimum 4-5 hours).

After surface is completely dry. Use Aqua based exterior coating / exterior oil. Stir the coating material thoroughly before use. And apply a thin uniform layer of the coating material on the deck surface by using brush or spray. Remember to pay special attention to the edges, joints and grooves (where nails are fixed).

Let the surface dry for one day & on next day if the surface doesn't appear saturated, apply another layer of coating material, specially at the nail insertion & cutting areas.

Allow the newly applied coating material and clean surface to dry for 12 – 24 hours, as it takes 12-24 hours for coating material to harden and saturate thoroughly, depending on weather condition (No watering shall be done during this drying period)

***

EP TOME™
Bamboowood Products

Maintenance Guidelines – Exterior Epitome Bamboowood Decking

Every high quality surface must be properly maintained to preserve its beauty
Epitome Bamboowood Outdoor Decking require regular maintenance
Epitome Bamboowood Outdoor Decking need to be maintained as per supplier's guidelines

Maintenance Required at Interval of

- *At the end of every season (Monsoon, Winter, Summer) in the first year*
- *Half yearly in second and third year*
- *Yearly thereafter and onwards*

DO'S

- *Regularly maintain your exterior decking as per manufacturer's advice.*
- *The care interval depends on wear & tear.*

DONT'S

- *Do not leave your exterior decking without proper maintenance.*
- *When moving heavy furniture or appliances always pick them up rather than sliding them across the floor*

Follow manufacturer's instructions at all times.

Steps for maintenance of Epitome Bamboowood Outdoor Decking:

Daily maintenance:

The surfaces of exterior product should be cleaned by using soft broom.

Weekly maintenance:

Wash out the dust & dirt from the exterior product by using normal clean water.

Half yearly/yearly maintenance:

Choose a nice sunny day to clean your Epitome Outdoor Decking, wear suitable clothing and gloves for safety. Start by spraying water with high pressure and clean the deck for removal of all dust, leaves etc.

Use Exterior Cleaner for outdoor decking. Rub the edges well.

After thorough cleaning of the surface, wash the surface again with high pressure water.

Let the surface dry in natural sunlight (minimum 4-5 hours).

After surface is completely dry. Use Aqua based exterior coating / exterior oil. Stir the coating material thoroughly before use. And apply a thin uniform layer of the coating material on the deck surface by using brush or spray. Remember to pay special attention to the edges, joints and grooves (where nails are fixed).

Let the surface dry for one day & on next day if the surface doesn't appear saturated, apply another layer of coating material, specially at the nail insertion & cutting areas.

Allow the newly applied coating material and clean surface to dry for 12 – 24 hours, as it takes 12-24 hours for coating material to harden and saturate thoroughly, depending on weather condition (No watering shall be done during this drying period)

***