Dear Readers,

IPIRTI WISHES YOU A “HAPPY & PROSPEROUS NEW YEAR 2017”
Indian Plywood Industries Research & Training Institute (IPIRTI), Bengaluru, India and MoEF&CC, New Delhi jointly organized the Session 87: “Innovation in the Panel Industry: Outlook and Concerns” during IUFRO Asia-Oceania Conference (24-27 October, 2016) at Beijing, China. The session was hosted on 26th October at China National Convention Center (CNCC) for deliberation about the latest advancements in the field of Panels and Composites from all sort of lignocellulosic materials including short-rotation plantation timbers, bamboo and other Agro and Forest residues. Current scenario and trends of wood based industries in Asian context were also discussed. Indeed that discussion will not only help in substituting the ever increasing demand on Wood/Timber from natural forests but also provide the appropriate remedial technology to address the issues of Climate Change in our Planet. Renowned scholars, delegates from all over the globe participated and shared their experiences. A four member delegation led by Dr. B.N. Mohanty, IFS, Director, IPIRTI with Dr. Suneesh Buxy, Dy. I.G.F (RT), MoEF&CC, Smt. Sujatha D. and Shri. Uday D.N., Scientist’s of IPIRTI participated in the Congress hosted at Beijing, China and organized the Technical Session on Innovations in the Panel
Industry. Apart from the congress, the delegation visited International Network for Bamboo and Rattan (INBAR) Headquarters at Beijing on 25.10.2016 and had fruitful discussions with Dr. Hans Friederich, Director General of INBAR in respect of the promotion of Bamboo based technologies worldwide.

The summary of the individual papers presented during the session are as follows:

**Paper-1: Technological Advancement in Wood and Wood based Panel Products**

(Dr. B.N. Mohanty, IFS, Director, IPIRTI, Bengaluru)

Wood is the most popular building material in the world since ages. As building sizes and market demand grew, the need to use wood with greater efficiency became more and more important. Today, there are dozens of wood panel products used in all genres of constructions, furniture and manufacturing. There is still ample room for growth in all panel sectors for new and improved products. To meet these spiraling requirements, innovation is call of the hour not only for product development but also for the concerned processing technologies. The advancements in the development of particle boards and fibre boards have also witnessed a major expansion of the fibre board industry and emergence of specialized particle boards. The use of all kinds of agro-residues for making particle board and fibre board has proven to be more environmental friendly and cost effective.

**Summary statement:** More use of fast growing plantation wood and application of green technologies
will go a long way in tackling the problems of global warming and climate change mitigation. It was also summarized that inclusion of wood and wood-based products into carbon accounting will constitute a positive step to increase wood consumption and carbon removals from the atmosphere by wood products. Focused areas of innovation for the future were highlighted as following. Utilization of plantation timber for higher grade panel; Oriented Strand Board; development of Sleek Boards; Surface treatment of wood/panel product; Chemical modification or heat treatment to enhance service life and Development of Bio-adhesive and other non-formaldehyde adhesives.

**Paper-2: Wood-Strand Sandwich Panels for Building & Transportation Applications**  
(Dr. Vikram Yadama, Washington State University, Pullman, USA)

Wood requirement in-house at present is about 224m$^3$ wherein the framing lumber share is 54% and other allied products constitute to 46%. Oriented Strand Board (OSB) captures about 60% of the building sheathing market. The present products are not efficient when converting solid wood that has stiffness of $\sim 10$ GPa to a composite that has stiffness of 4.8 GPa. This study is focused on fabrication, performance, and application of wood-strand sandwich panels designed to meet the long-term goal of combining energy and structural demands of a building envelope. A wood-strand sandwich panel with a thin walled 3-D core has been developed for use in building envelopes, as well as for applications where lightweight structural sandwich panels are desired (such as transportation). Underutilized timber from forest thinning or fast growing plantations is ideal for fabricating these panels. These panels have a bending stiffness that is 21% stiffer than commercial OSB but a density of only 300 kg/m$^3$. The sandwich panel is significantly stiffer in bending with increased R-value while utilizing over 40% less material than typical OSB sheathing material of equal thickness. Resin consumption, which accounts for approximately 30% of the production costs in a typical composite panel plant, could be reduced by over 40%. Incorporation of insulation into the cavities of the sandwich panel significantly improves thermal properties. These high performance and lightweight sandwich panels can be utilized for prefabricating building envelopes and used for in shipping containers.

**Summary statement:** Light weight sandwich panels are more efficient in use of materials with
significantly less fibre and low resin usage than solid panels besides giving high strength to weight and stiffness to weight ratios. The panels are best suited for all kinds of panelised construction. These panels utilize multiple core layers to meet energy performance with a thin walled and continuous channel for airflow in one direction and they form energy efficient building construction.

**Paper-3: Panel Industry Scenario in India (Mr. Uday D.N., Scientist, IPIRTI, Bengaluru)**

As on today Indian panel industry consists of more than 2500 mills with various capacities. A majority of these industries are producing plywood (Market share 76%) and are dependent upon the plantation grown timber species viz. Populus spp., Eucalyptus spp., Silver Oak (Grevillea robusta), Melia dubia, Rubber wood etc., which indirectly reduces pressure on natural forests and help in conservation efforts. While India’s use of Particle board and Medium Density Fibre (MDF) board still remains modest by Global standards, a recent upswing in the economy and Government reforms, sustained economic growth over next five years would bring about changes in future. There is a trend of 15% growth annually in utilization of particle board and MDF which is likely to rise as Indian architects and furniture manufacturers are preferring to choose more modern materials rather than stick to the traditional plywood.

Through the effective research by the Scientists of Indian Plywood Industries Research & Training Institute (IPIRTI) it was possible to broaden the market of some plantation products into specialty products i.e. treated wood with enhanced dimensional stability and service life, development of quality composite panel materials like Decorative/Marine/Shuttering grade Plywood, Laminated Veneer Lumber (LVL), Compreg etc. A significant development towards use of non-wood raw material for panel products is the Bamboo Mat Board [BMB], Bamboo Mat Veneer Composite [BMVC], Bamboo Mat Corrugated Sheet [BMCS], Bamboo Mat Moulded Skin Board [BMMSB] made out of mats woven with bamboo slivers, Bamboo Laminates/ Lumber, Particle board produced from rice husk, jute fibres, cotton stalks, Pine needle etc., and Medium density fibre board from bagasse, bamboo, rice/wheat straw etc.

**Summary statement:** Based on the panel product scenario in India and the research work carried out on products development, it is concluded here that Indian wood based Industry has a great potential to emerge as Asia’s major wood-based industry. The demand currently exceeds supply and most of the industries in India run mostly through imported raw-materials. The need of the hour is to initiate investment by larger firms and meet the demands by increasing supply through local plantation resources.
Paper-4: Panel Wood Industry of Bangladesh: Future Scenarios Applying Climate Change
(Prof. Dr. Mohammed Al-Amin, University of Chittagong, Bangladesh)

Bangladesh has been facing climate change as a major challenge. Forest and its proper utilization may be one of the options to combat this challenge. However, according to government estimate Bangladesh possesses 1.52 million ha of forest land comprising 17.08% of total land mass of the country and cannot supply the total demand of forest wood and wood products of the country. About 19 tree species, mainly used as raw materials for industry are disappearing rapidly and are considered as threatened. To meet the demand of timber and wood, Bangladesh needs to maximize the production & utilization of timber and import wood from overseas. Most of the forest based industries are owned by the government. Nevertheless, Government is looking for privatization of these state owned mills mainly due to non-profitability. However, dedicated plantations for the industry to supply raw materials, using modern technologies and putting emphasis on product development research may change the situation and sustain the growth in production of panel products of the country.

Summary statement: Currently, forest wood based industries of Bangladesh are passing a very crucial stage of existence particularly in Government sector. This sector has potential to minimize the wastage of wood and help the country to sequester carbon to combat adverse effect of climate change. Hence, proper technical support with modern technologies and sufficient supply of raw material may turn the panel wood industry viable in the country.

Paper-5: Mechanical Performance of Poplar LVL (Laminated Veneer Lumber) Reinforced by Bamboo Scrimer (Mr. Zhaopeng Tian, Chinese Academy of Forestry, Beijing)

Poplar LVL (Laminated Veneer Lumber) is a main commercial wood product for furniture and doors in China. But as for structural components Poplar LVL is limited in use for its relatively low stiffness. In this paper, bamboo scrimers were glued to the Poplar LVL surfaces to reinforce the mechanical performance and the effect of various ratios of bamboo scrimer to LVL on the mechanical performance of the composite were examined. Mechanical test including shear strength, Modulus of Rupture (MoR) and Modulus of...
Elasticity (MoE) of bamboo scrimber reinforced poplar LVL were carried out according to JAS 2773-2013 Standard for LVL. The results showed that increasing bamboo scrimber’s thickness by about 33% as reinforcement to Poplar LVL resulted in increased mechanical properties. Therefore, the mechanical performance of Poplar LVL can be improved by controlling the thickness of bamboo scrimber to meet the requirements of structural engineering materials.

Summary statement: From the research carried out it was concluded that appropriate amount (i.e., maximum 33%) of bamboo scrimber as reinforcement in Poplar LVL can greatly improve the mechanical properties. However beyond 33%, use of bamboo scrimber could not improve the mechanical properties and so adverse effects.

Paper-6: Innovations in the Field of Adhesives for Panel Products
(Ms. Sujatha D., Scientist, IPIRTI, Bengaluru)

Adhesives are backbone of panel product industries and play an important role from the point of view of durability as well as cost. Phenol Formaldehyde (PF) resin continues to remain the most preferred adhesive in India especially for weather resistant panel products while the Amino resins are more commonly used for all kinds of interior applications. A number of natural materials are available which in their molecular architecture resemble Phenol and are capable of undergoing similar reactions. With the use of renewable natural materials, IPIRTI has unveiled a new “green” adhesive which may replace PF resin being used to manufacture boiling water resistance grade plywood. These materials being indigenously available from renewable natural resources are comparatively cheaper and eco-friendly. It has been observed that 30 – 40% replacement of phenol in PF resin with natural materials resulted in cost reduction of 20 – 30%.

In a parallel development, the emission of formaldehyde gas from panels bonded with Urea Formaldehyde (UF) resin has been inviting serious environmental concerns and health hazards. IPIRTI has come up to develop UF resin using suitable scavengers that could mop up the free formaldehyde during the resin preparation thus minimizing formaldehyde emission.

Summary statement: The conclusions drawn from the above developments are that replacement of Phenol by Cardanol, Lignin, Black Liquor, Tannin extracts and Soya chunks by 20-25% increases the utilization of ecofriendly materials without affecting the quality of the end product. This also reduces the cost of adhesive. Amino resins modified using scavengers are the best means to manufacture environment friendly E1 class adhesives.
Dr. B.N. Mohanty, IFS, Director also attended the 21st Executive Committee Meeting of Asia Pacific Association of Forest Research Institutes (APAFRI) on 25.10.2016 in Beijing, China on behalf of IPIRTI which was being organized as a parallel event in Beijing, China.

Industry visits
10.11.2016-11.11.2016: Dr. B.N. Mohanty, IFS, Director, Dr. Vipin Chawla, Scientist and Shri. Amitava Sil, Officer-In Charge, IPIRTI, Field Station Kolkata visited to review the preparation at Palace Ground, Imphal, Manipur and had discussion with Shri. Prithvi Nath Prasad, PCCF (HoFF) and Shri. Brajamani Sharma, Mission Director, State Bamboo Mission, Manipur regarding Demonstration-cum-Hands on Exercise with Bamboo Primary Processing Machines in Sangai Festival, Manipur.


27.11.2016-02.12.2016: Dr.V.K. Upadhyay, Scientist visited Kandla Port Custom Office and met Shri. P.V.R. Reddy, Principal Commissioner & Statistical wings Shri Sai Sashtri, Statistical Officer for collection of import data on wood and wood products at Kandala Port.
He visited Kandla Timber Association and met Shri. Shantilal Parekh, President and Shri. Tinu Gandhi and discussed about import of wood products and collected 27 years import of logs data.
He also visited wood based panel industries at Moti Chrai and met Shri. Vivek Aggarwal, General Manager and Dr. Purshotam Sharma, M/s. Century Plywood Industry and discussed about raw material availability, production, import of wood logs etc.

Meetings/Seminars/Conferences
03.10.2016: Dr. B.N. Mohanty, IFS, Director attended and participated in the discussion held at Research Advisory Group (RAG) Meeting of Institute of Wood Science & Technology (IWST), Bengaluru.

06.10.2016: Shri. Kiran M.C and Smt. Mamatha B.S., Scientists visited Central Coir Research Institute (CICT), Bengaluru to have discussion on the project “Study on Acoustic and Thermal efficiency of panels made from Agro residues”.

18.10.2016: Dr. B.N. Mohanty, IFS, Director attended the meeting with officials of ICFRE, IGNFA, IIFM and DFE under the Chairmanship of Director General of Forest & Special Secretary, MoEF&CC in Krishna Conference Hall, MoEF&CC, New Delhi for review of progress of research activities.
20.10.2016: Shri. Amitava Sil, Scientist/Officer-In-Charge, IPIRTI, Field Station Kolkata attended National Seminar on “Standards Build Trust” on the occasion of World Standards Day at Hotel, Stadel, Kolkata.

25.10.2016: Dr. Manoj K. Dubey, Joint Director participated in Stakeholder Consultation Workshop on Draft Forest Management Certification Standard developed by Network for Certification and Conservation of Forest (NCCF) at Institute of Wood Science & Technology (IWST), Bengaluru.

08.11.2016: Dr. B.N. Mohanty, IFS, Director participated in the National Convention on “Innovation in Green Highways” organised by the National Green Highways Mission, National Highways Authority of India at Madhyanchal Bhawan, Vasant Kunj, New Delhi and Co-chaired a Session on “Green Highways, Livelihoods and Entrepreneurship Development”.

21-25.11.2016: Dr. Ranjana Yadav, Scientist/Officer-In-Charge, IPIRTI Centre Mohali attended the 5 days training program on Nanomaterials : Characterizations and Applications at NITTTR, Chandigarh.

23.11.2016: Shri. Anand Nandanwar, Scientist attended Twenty first meeting of Civil Engineering Division Council (CEDC) as a Member at Bureau of Indian Standards (BIS), New Delhi.

30.11.2016: Dr. Manoj K. Dubey, Joint Director participated and discussed at Foremen Training Institute (FTI), Bengaluru to conduct International Seminar on Skill Development with Jawaharlal Nehru University, New Delhi.

05.12.2016: Shri. Amitava Sil, Scientist/Officer-In-Charge, IPIRTI, Field Station Kolkata attended Assam Invest Road Show on “Food Processing, Plastic & Bamboo” inaugurated by Shri. Chandra Mohan Patowary, Hon’ble Minister of Industries & Commerce, Govt. of Assam at Hotel Oberoi Grand, Kolkata which was organized by Confederation of Indian Industry (CII), Kolkata. He also attended B2B discussion on “Potential Chain –Bamboo” during the parallel session.


MoU signed

21.10.2016: A Memorandum of Understanding (MoU) has been signed by Director, IPIRTI with M/s. Omfurn India Pvt. Ltd., Mumbai for “Testing and Evaluation of Two hour Fire Rated Door”.

Exhibition:


Shri. Amitava Sil, Officer-In-Charge, Shri. S.C. Sahoo, Scientist, Shri. A.A. Solanki, Shri. H. Mondal, Shri. D.Pal, Shri. C.S.Raut, Staff of IPIRTI Field Station Kolkata participated in 12th Jatiya Sanhati Utsav –O- Bharat Mela-2016, National Exhibition Cum Fair & Seminar organized by Bangiya Seva Samity, Sonarpur Kolkata and exhibited a stall in the exhibition. The main theme of the exhibition was “Make In India Through Science & Technology”. The stall of IPIRTI was visited by Smt. Satabdi Roy, Hon’ble Member of Parliament, Lok Sabha where she appreciated the work done by IPIRTI related to Bamboo.

HIGHPOINTS

Performance Review of IPIRTI
04.10.2016-06.10.2016: The Performance Review of IPIRTI as per Rule 208 of GFR relating to Autonomous Bodies was carried out under the Chairmanship of Dr. Amritphale, Chief Scientist, CSIR-AMPRI, Bhopal.

Vigilance Awareness Week
31.10.2016-05.11.2016: Vigilance Awareness Week was observed at the Institute by displaying Banners and Posters on the theme “Public participation in promoting Integrity and eradicating Corruption”. Both the Vigilance Pledge and Integrity Pledge were administered in English and Hindi by Dr. B. N. Mohanty, IFS, Director and Dr. Manoj K. Dubey, Joint Director respectively among all the staff and students of IPIRTI on 01.11. 2016.
Swacchhata Day

03.10.2016, 28.10.2016 and 25.11.2016: Dr. B.N. Mohanty, IFS, Director along with Scientists, Staff and Trainees of IPIRTI observed Swacchhata Day by organizing Campus Cleanliness Drive inside the campus and facilities.

Kannada Rajyotsava Celebration

16.11.2016: Kannada Rajyotsava 2016, was celebrated at IPRITI, Bengaluru. The programme commenced by lighting the lamp followed by various cultural programmes. It was announced to conduct Kannada Learning Classes for PGDC Trainees and Non-Kannadiga staff of IPIRTI in order to promote State Language Kannada. Shri. Ramesh, Language Facilitator from Kannada and Cultural Department, Govt. of Karnataka was appointed as Master for teaching Kannada for a period of 3 months. Accordingly, the learning classes are to commence from 03.01.2017.

Observance of Constitution Day

26.11.2016: IPIRTI observed the 125th Birth Anniversary Year of Dr. B.R. Ambedkar by observing “Constitution Day” through display of Banners and Posters in the Institute. “Preamble to the Constitution of India” was administered in English and Hindi by Dr. B.N. Mohanty, IFS, Director and Dr. Manoj K. Dubey, Joint Director respectively to all the staff and students of IPIRTI. Also a small quiz competition was conducted about “Constitution of India” among the PGDC trainees.
One Year Post-Graduate Diploma Course on Wood and Panel Products Technology:

The 27th Batch of one year Post-Graduate Diploma Course in Wood and Panel Products Technology has been successfully completed and all the 31 trainees have got 100% placement in Plywood and other Wood based industries through Campus Interview.

Valedictory Function:

Valedictory address was given by Dr. M.H. Swaminath, IFS (Retd) and former APCCF & Secretary to Govt. of Karnataka, Bangalore. Medals & Diploma Certificates were awarded to the successful trainees by the Chief Guest Dr. M.H. Swaminath, IFS (Retd) and the Director, Dr. B.N. Mohanty, IFS on 09.11.2016.

Special Training Courses:

“Demonstration-cum-Hands on Exercise with Bamboo Primary Processing Machines for Bamboo Skill Development during North East Festival events” from 01st to 10th December, 2016

IPIRTI in collaboration with Ministry of Development of North Eastern Region (DoNER), Nagaland Bamboo Development Agency (NBDA) and Nagaland State Forest Department organized 10 days training programme under the leadership of Dr. B. N. Mohanty, IFS, Director, IPIRTI on Bamboo Processing during 1st - 10th December, 2016 at the Hornbill festival, Kisama hill, Kohima, Nagaland. The demonstration and training was conducted by Scientists and technical staff of IPIRTI with the help of the functionaries of Nagaland State Bamboo Missions-Nagaland Bamboo Development Agency and Nagaland State Forest Department.
Under this programme, training was imparted to the various delegates from Bamboo based Industry, Forest Department officials, NBDA staff, Entrepreneurs, Local Youths and Artisans and awareness was generated about usage of Bamboo Processing Machines in making of Bamboo artifacts and further dovetailing to high end industrial products for employment and prosperity. About 185 participants were undergone training. Besides display to general public was also arranged during this festival in order to propagate and promote the bamboo technologies to improve the utilization of the materials and to create awareness about the use of bamboo as an alternative to wood composites thereby conserving the forest.

*Bamboo primary processing machines used for training*

*Training group from Nagaland Forest Department*
Training group from Nagaland Industry and Commerce Department

Training group from Working Plan division-Nagaland Forest Deptt

Local youths from Nagaland
Our thanks are due to Ministry of DoNER for funding the training, PCCF Nagaland, Nagaland Bamboo Development Agency for their help and support towards successful organization of aforesaid training.

Training on “Primary Processing of Bamboo” at Central Academy for State Forest Service (CASFoS), Burnihat, Assam during 19th to 23rd December, 2016

IPIRTI has already became a nodal centre for development of industrial product from bamboo. Bamboo based composites provide promising linkages between organised sector (resin bonded boards) and un-organised sector (hand woven mats). Thus, it has significant potential to uplift the economy of bamboo growing areas by generating awareness, skill up-gradation, technology transfer where IPIRTI has been playing a key role. IPIRTI in collaboration with Ministry of DoNER, had organized 5 days training programme on bamboo processing at CASFoS, MoEF&CC, Burnihat, Assam during 19th to 23rd December, 2016.
The training module consisted of theory classes for three hours with power presentation featuring key points are as follows:

(a) Bamboo – Introduction and basic properties
(b) Processing of Bamboo with special emphasis on primary processing with machineries
(c) High end products from bamboo

and then two and half hours of practicals about based demonstration cum training in bamboo processing machineries.

The hands on exercise on bamboo processing machines that were familiarized among the trainees during the training course are as follows:

(a) Bamboo Cross Cutting Machine
(b) Bamboo Radial Splitter Machine
(c) Bamboo External Knot Removal Machine
(d) Bamboo Thick Slicer Machine
(e) Bamboo Thin Slicer Machine
(f) Bamboo Round Stick making machine
(g) Bamboo stick polishing machine
(h) Bamboo stick sizing machine

Shri. Roshan Horo, Principal, CASFoS and Shri. N. Luikam, Lecturer, Dr. B. N. Mohanty, IFS, Director, Dr. Manoj Kumar Dubey, Joint Director, Shri. Amitava Sil, Scientist, Dr. Pradeep Kushwaha and Shri. S. C. Sahoo, Scientist’s were present on the opening day of the five days training programme. Shri. Arvind Madhav Singh, IFS, APCCF, Dept. of Environment and Forest, Govt. of Assam addressed the trainees on the second day and gave a short presentation on “Present status of Bamboo in Assam”. Shri. S. Ashutosh, IFS, Addl, PCCF, Forest and Environment, Govt of Meghalaya was present on the fourth day of the training programme and also addressed the trainees. Shri. Vikram Thapa, Addl PCCF, Dept of Environment and Forest, Govt. of Assam was also present on the fourth day.

Dr. B. N. Mohanty, IFS, Director, Dr. Manoj Kumar Dubey, Joint Director, Shri. Amitava Sil, Shri. S. C. Sahoo, Dr. Pradeep Kr. Kushwaha, Scientists, Shri. Akash Anand Solanki, Technical Assistant and Shri. Kalyan Chakravarthy, Technical Staff conducted 5 days training programme on Primary processing of bamboo for sliver and round stick making under “Demonstration-cum-Hands on Exercise with Bamboo Primary Processing Machines”. Approximately 238 nos. of youths from Assam Forest School, Jalukbari, Assam; Ri-bhoi Area Welfare, Meghalaya; CBTC, Assam; CASFoS, Burnihat, Assam; Dept. of Environment and Forest, Silviculture Division; Central Institute of Plastics Engineering & Technology, Guwahati; Dept. of Environment and Forest, FRS Division, Assam; Forest and Environment Department, Govt. of Meghalaya and M.B.D.A, Shillong, Meghalaya participated in the training programme at Central Academy for State Forest Service (CASFoS), Burnihat, Assam.
Shri S. Ashutosh, IFS, Addl, PCCF, Forest and Environment, Govt. of Meghalaya addressing the trainees

Trainees from Assam Forest School, Jalukbari
with faculty of IPIRTI

Trainees from Assam Forest School, Jalukbari
during demonstration session

Trainees from CIPET, Guwahati

Trainees from CASFoS, Burnihat, Assam, with IPIRTI Faculty

Shri S. Ashutosh, IFS, Addl, PCCF, Forest and Environment,
Gort. of Meghalaya addressing the trainees

Trainees from CASFoS, Burnihat, Assam, attending Theory Session
### SHORT TERM TRAINING COURSES FOR JAN - JUL, 2017 AT BENGALURU

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Title of the Training Course</th>
<th>Duration</th>
<th>Date</th>
<th>Fees*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Identification of Timbers(Theory &amp; Practical for wood/timber identification)</td>
<td>3 Days</td>
<td>Jan 23-25</td>
<td>11500</td>
</tr>
<tr>
<td>2.</td>
<td>Testing Of Plywood And Block Board As Per IS:303,IS:710,IS:1328,IS:4990 And IS:1659</td>
<td>5 Days</td>
<td>Feb 06-10</td>
<td>23000</td>
</tr>
<tr>
<td>3.</td>
<td>Resin Manufacturing</td>
<td>3 days</td>
<td>Feb 20-22</td>
<td>11500</td>
</tr>
<tr>
<td>4.</td>
<td>Preservative Treatment Methods For Wood And Wood Based Panels</td>
<td>3 days</td>
<td>Mar 07-09</td>
<td>11500</td>
</tr>
<tr>
<td>5.</td>
<td>Manufacture of Particle Board</td>
<td>5 days</td>
<td>Mar 20-24</td>
<td>17250</td>
</tr>
<tr>
<td>6.</td>
<td>Analysis Of Raw Materials For Resin Manufacture</td>
<td>3 days</td>
<td>Apr 05-07</td>
<td>11500</td>
</tr>
<tr>
<td>7.</td>
<td>Testing Of Door Shutters As Per IS: 2202, IS:1003, IS: 4020</td>
<td>3 days</td>
<td>Apr 18-20</td>
<td>17250</td>
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<td>8.</td>
<td>Estimation Of Preservative Chemicals content In Wood/Plywood</td>
<td>5 days</td>
<td>Apr 24-28</td>
<td>17250</td>
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<td>9.</td>
<td>Peeling &amp; Knife Grinding</td>
<td>3 days</td>
<td>May 17-19</td>
<td>11500</td>
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<td>10.</td>
<td>Wood Seasoning</td>
<td>3 days</td>
<td>May 29-31</td>
<td>11500</td>
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<td>11.</td>
<td>Testing Of Flush Door And Block Board As Per IS:2202 And IS:1659</td>
<td>5 days</td>
<td>Jun 12-16</td>
<td>23000</td>
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<td>12.</td>
<td>Plywood Manufacturing-I ( Log Storage, Centering, Peeling, Chipping, Drying, Knife Grinding)</td>
<td>5 days</td>
<td>Jul 10-14</td>
<td>17250</td>
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<tr>
<td>13.</td>
<td>Plywood Manufacturing- II ( Adhesives For Plywood And Plywood Manufacturing-Resin Preparation, Gluing, Hot Pressing)</td>
<td>5 days</td>
<td>Jul 17-21</td>
<td>17250</td>
</tr>
</tbody>
</table>

* 15% Service Tax Extra

** Programme Coordinator: Dr. V K Upadhay, Head, IT & SORIT (upadhyay@ipirti.gov.in). You can apply online by filling and submitting the Registration Form (PDF)/Registration Form (doc). Registration has to be done 10 days before the date of commencement of the course by remitting prescribed course fee. Fees payable to the organization may be sent by crossed Demand Draft in favour of Director, IPIRTI, Bengaluru and sent by post to Post Bag No.2273, Tumkur Road, Yeshwanthpur PO, Bengaluru - 560 022.

### SHORT TERM TRAINING COURSES FOR JAN - JUL, 2017 AT KOLKATA

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<th>Duration</th>
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<tr>
<td>1.</td>
<td>Testing of Plywood, Block Board, Flush Door</td>
<td>3 Days</td>
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<td>2.</td>
<td>One Month Training Course On “ Plywood Manufacturing Technology”</td>
<td>1 Month</td>
<td>06 Jan-17 Feb</td>
<td>23000</td>
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<td>3.</td>
<td>Analysis of raw material for resin manufacturing.</td>
<td>3 days</td>
<td>Feb 06-08</td>
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<td>4.</td>
<td>Preliminary Bamboo Processing</td>
<td>3 days</td>
<td>Mar 06-08</td>
<td>11500</td>
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</table>
5. Resin Manufacturing 3 days Apr 17-19 11500
6. Particle Board Manufacturing 5 days May 15-19 17250
7. One Month Training Course on “Plywood Manufacturing Technology” 1 Month Jun 01-30 23000
8. Block Board & Flush Door Manufacturing 5 days Jul 17-21 17250

* 15% Service Tax Extra ;
** Programme Coordinator: Mr. Amitava Sil, IPIRTI Field Station Kolkata, 2/2 Biren Roy Road (West), Sarsuna, Kolkata-61, Tele Fax: 033-24983120, Mob: 09874219758 (ipirtikolkata@ipirti.gov.in). Registration has to be done 10 days before the date of commencement of the course by remitting prescribed course fee. Fees payable to the organization may be sent by crossed Demand Draft in favour of Director, Indian Plywood Industries Research & Training Institute. You can apply online by filing and submitting the Registration Form.

SHORT TERM TRAINING COURSES FOR JAN - JUL, 2017 AT MOHALI

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<th>Sl. No</th>
<th>Title of the Training Course</th>
<th>Duration</th>
<th>Date</th>
<th>Fees*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Testing Of Block board And Flush Door As Per IS: 1659 &amp; IS: 2202 (Part - I)</td>
<td>3 Days</td>
<td>Feb 13-17</td>
<td>11500</td>
</tr>
<tr>
<td>2.</td>
<td>Analysis of Raw Material and Resin Manufacturing ( PF &amp; UF)</td>
<td>5 Days</td>
<td>Mar 06-10</td>
<td>11500</td>
</tr>
<tr>
<td>3.</td>
<td>Testing of Fire Retardant Plywood As Per IS: 5509</td>
<td>2 days</td>
<td>Apr 05-06</td>
<td>5750</td>
</tr>
<tr>
<td>4.</td>
<td>Testing of Plywood As Per IS 303, 1328, 710 &amp; 4990</td>
<td>5 days</td>
<td>May 15-19</td>
<td>13800</td>
</tr>
<tr>
<td>5.</td>
<td>Testing Of Block board And Flush Door As Per IS: 1659 &amp; IS: 2202 (Part - I)</td>
<td>5 days</td>
<td>Jun 12-16</td>
<td>11500</td>
</tr>
<tr>
<td>6.</td>
<td>Testing Of Fire Retardant Plywood As Per IS: 5509</td>
<td>2 days</td>
<td>Jul 17-18</td>
<td>5750</td>
</tr>
</tbody>
</table>

* 15% Service Tax Extra
** Lodging and Boarding are not included and have to be arranged by the trainees. Programme coordinator: Dr. Ranjana Yadav (ranjana@ipirti.gov.in) IPIRTI Centre (MoEF, Govt of India) B-65, Phase -7, Industrial Area, Mohali-160055, Punjab

Registration has to be done 10 days before the date of commencement of the course by remitting prescribed course fee
SUPERANNUATION

Smt. Shanthi K., Administrative Officer retired on 31st October, 2016. The Institute acknowledges her services rendered and wishes her a Happy & Peaceful Retired Life.