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Vol. 11, No. 2 April-June, 2010

Dear Members,

By the time this issue of Institute's News Letter lands in your hand, you will find an announcement released in leading News papers & Rojgar Samachar inviting applications for 1 year PGD Course in "Wood & Panel Products Technology" to be conducted at IPIRTI. This is one of the best and unique training programme conducted by the Institute for the science/engineering graduates who wanted to choose a carrier in production of green industrial products, viz., plywood, particleboard and engineered wood products.

IPIRTI has been playing a leading role in providing technically trained manpower required for industries for the last several decades. So far 478 candidates have been trained and placed through campus selection in many leading plywood industries and are working in the capacity of production manager, resin expert, quality control expert, marketing manager etc.

This training course aims at imparting professional knowledge and skills with regard to processing technologies for efficient utilization of wood through conversion into engineered wood and a variety of panel products. Emphasis is given not only to theoretical background but also practical and hands on exercises by highly qualified and experienced scientists. This year onwards management topics are included so as to meet the present day needs of the industry.

I therefore request all the industries to sponsor candidates for the said PGD Course to take full advantage of IPIRTI's Training Programme.

Dr. C. N. Pandey
Director

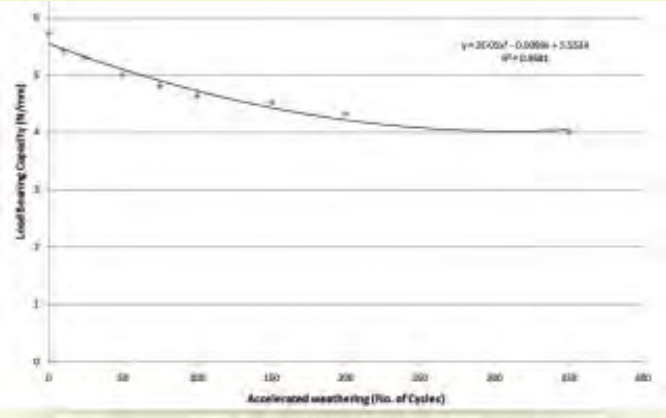
RESEARCH & DEVELOPMENT

A STUDY ON SERVICE LIFE OF BAMBOO MAT CORRUGATED SHEET(BMCS)

Studies were carried out at IPIRTI to predict the service life of Bamboo Mat Corrugated Sheet (BMCS). BWP grade Bamboo Mat Corrugated Sheets (BMCS) of thickness of 4-5 mm processed in-house were randomly selected and exposed to accelerated weathering cycles in Ultra violet weather-ometer. In the absence of national/ international standards for bamboo based panel products the cycles were designed to suit lignocellulosic composites viz. BMCS. Each cycle consisted of irradiance, condensation and water spray was designed. Since BMCS is fibrous lignocellulosic material, it needs full irradiance of UV spectrum and therefore UV-B 313nm type lamps were selected for the studies. Each cycle consisting of irradiance was set to 0.55N/m^2 at 80°C for 20 hours, Condensation temperature was set at 50°C for 3 hours followed by water spray at a pressure of 7 psi for 1 hour (for the removal of erosion and to make the clean surface for the further exposure). De-mineralized water was used for water spray to avoid corrosion. At the end of 10, 25, 50, 75,100,150 and 200 cycles, samples were drawn and tested for load bearing capacity.

These results were co-related with the results of natural weathering samples collected from the BMCS roofing of bamboo based houses erected at the campus of IPIRTI, Bangalore after exposure of 4, 5 and 7 years. The correlation between natural weathering (in years) and accelerated weathering (number of cycles) was drawn.

From the study, it was observed that 63, 75 & 100 cycles of accelerated weathering are equivalent to the 4, 5 & 7 years of natural weathering respectively. Then, graph was drawn for load bearing capacity vs. Cycles of exposure.



Relationship between Load bearing capacity and Accelerated weathering

UV - Weather-ometer

The projected graphical results were statistically analyzed and it was observed that load bearing capacity of 4.0N/mm (which is the minimum requirement of load bearing capacity as per IS: 15476) was attained after 350 cycles of accelerated weathering, which is equivalent to 27 years of natural weathering. Hence the life of BMCS can be predicted to 25-27 years.

CHEMICAL TREATMENT & SEASONING OF PINUS RADIATA TIMBER

CPWD is doing the construction work of shooting range complex for Sports Authority of India at Bangalore. For the purpose of lining of shooting range baffels,pi*nus radiata* timber is being used to prevent richochet of misdirected bullets. As these baffles are placed in open area, and are exposed to sun and rain throughout the year, the location is more susceptible to termite, borer and fungus attack.

Preservative treatment and drying of the timber are based on the grade of timber and its end use application. Since *Pinus radiata* timber contains large portion of sapwood, as such it is liable to deteriorate. Hence, investigations were carried out to find out suitable preservative chemicals, including their compositions and concentrations so as to give resistance to the timber against termite, borer and fungus.

Keeping this in view a project on "Chemical Treatment and seasoning of *Pinus radiata* timber for shooting range complex at SAI, Bangalore" has been sponsored by CPWD, Bangalore and was taken up by IPIRTI at their pressure impregnation plant.

Pressure Impregnation Plant

EFFICACY OF COPPER-ETHANOLAMINE BASED WOOD PRESERVATIVE AGAINST MOULD FUNGI

The conservation of wooden objects is almost as old as its usage. Under favorable conditions timber has been known to last for many years. But preservation of wood has gained more importance than its production due to increasing cases of deterioration of wood and wood products. Deterioration of wood is not only age dependent but also caused by different biotic as well as abiotic factors. Biotic factors include mostly the insects and microorganism like bacteria, fungi etc.

Chemical pesticides are used as the frontline defence source against pests in India, inspite of their drawbacks. The commonly used wood protection/ preservative chemicals are CCA, CCB, ACC, Creosote and LOSP. These conventional wood preservative chemicals are very prominent against wood destroying organisms but they are creating environmental problems.

In the present scenario, Copper Chrome Arsenic and Copper Chrome Boron are widely used chemicals against wood destroying organisms. Copper is a fungicide and boron is an insecticide, both are effective against wood destroying fungus and insects respectively. Due to the leaching property of Copper and Boron they cannot be used without fixing agent to fix them in the wood. Chromium is the most efficient fixing agent. Since it is carcinogenic in nature it is on the way to get banned. Hence, it is essential to find out an alternative fixing agent.

Samples after exposure showing fungal attack (a. Control samples, b. CEB 5%)

In the present investigation attempts were made to replace Chromium with Ethanolamine. Copper Ethanolamine Boron (CEB) at (10%EC) at four different levels of concentration was tested against moulds. Results obtained from the toxicity study against moulds (brushing method) indicate that 5% concentration acts as an effective fungicide against mould fungi. However further pilot plant studies are being continued to prepare the panels and test the efficacy on various end use applications against different bio-agents.

HIGHLIGHTS OF 54TH RAC MEETING AT IPIRTI, BANGALORE

54th RAC meeting was held on 6th April 2010 at IPIRTI, Bangalore. Dr. C.N. Pandey, Director, welcomed Shri Sajjan Bhajanka, Chairman of RAC and all members present. He expressed his gratitude for the Chairman's keen association with IPIRTI. Director thanked the Chairman for sparing his valuable time and being at IPIRTI to preside over the RAC meeting. Dr. Pandey also informed that Shri Bhajanka is a well known person in the plywood and panel industry and complemented the Chairman for providing dynamic leadership to FIPPI and for efforts in guiding wood industries to overcome their problems in the field of R & D. Dr. Pandey also welcomed all the industrialists, scientists of other R & D institutions which give more strength to receive their guidance. Dr. Pandey expressed happiness to have Dr. Swaminath, Addl. PCCF, Karnataka Forest Dept., whose valuable input is very much important in this meeting. He also welcomed all Industry and Institute representatives whose wide expertise in the field of R& D activities will be very much required for this meeting.

Dr. C. N. Pandey, Director IPIRTI welcomes RAC members

Highlighting the constitution of the present RAC, Dr. Pandey informed that RAC of IPIRTI is represented by industrial entrepreneurs, scientists from forest based research institutes and other National research institutes and senior forest officials. However, the most important feature of RAC is its major representation by wood panel and allied industries. He mentioned that majority of projects are taken up by the Institute based on the requirement of the industry or looking into the future need of the industry. Members of RAC as well as industry help to formulate research projects.

Introductory remarks by the Chairman

Shri Sajjan Bhajanka, Chairman, RAC, welcomed all the members. In his opening remarks he expressed satisfaction over the research work undertaken by the Institute for fulfilling the prime objectives of the industries. He appreciated the overall performance of the Institute in the field of various R & D subjects, training and assisting the industries by various guidance, advices towards up-coming of the industries in panel production, energy consumption and testing. He highlighted that the panel consumption in India was negligible compared to that in developed countries. He informed that although massive program was taken up for plantation but forest and tree cover in the country has remained not more than 20% of the land area of the country. He informed that panel consumption has gone up tremendously due to housing activities in the country which is likely to increase in the coming years. He also informed that African countries have more resources but are not fully exploited. Indian entrepreneurs may resource timber from Africa to avoid the scarcity of raw material. He stressed that country has to use the waste land or surplus land to raise plantations. He opined that IPIRTI and FRI have to play an important role in identifying species and convince farmers to work out a module for industrial plantation.

A view of RAC meeting held at IPIRTI, Bangalore

Shri Bhajanka ,Chairman,RAC stressed that the need of the hour is the technologies to energy conversion. He cited an example that, in certain developed countries, one planing machine is being used at present compared to the five planing machine used earlier. This would save about 80% energy thereby having higher yield and economy in production.

He appreciated Director for starting a Field Station at Mohali in association with NIPMA, and hoped that the Institute will get more exposure in future. He also appreciated Director for good leadership and IPIRTI for its contribution to panel industry. He expressed his happiness for having kept motivated SIPMA and NIPMA in all activities. He invited all the members of the industry to take the benefit of the research outcome of the Institute.

Dr.S.K.Nath, Joint Director, IPIRTI , Bangalore briefed on the progress of the following ***ongoing Institute / Sponsored Projects:***

A. Ongoing Institute Projects:

1. Development of fire retardant Flush Door.

2. Evaluation of earthquake resistant feature of Bamboo housing system using shock table.

3. Emission of formaldehyde from particle board.

4. Development of technique for production of face veneers from reconstituted plantation timbers.

5. Development of reduced/ zero formaldehyde emission bio adhesives for wood and panel products.

6. Recycling of wood for Panel Products.

7. Study on fire performance of door and shutter assemblies and formulation of standards in line with international standards.

8. Study on performance of furniture and development of test methods.

9. Development of technology for manufacture of particle board from bamboo and bagasse.

10. Efficiency of copper- ethanolamine boron based wood preservative against wood destroying organisms.

11. Screening of some newer insecticides against wood destroying insects.

12. Development of an exterior grade durable UV radiation protective and weather resistant coating for wood based panel products and bamboo composites for exterior applications.

13. Establishment of pilot scale facilities for R & D and Training in MDF.

14. Up-scaling of technology for manufacture of single/3-layered particle board from rice husk.

15. Polyurethane based adhesive for bonding wood and bamboo based products.

16. Zero formaldehyde emission adhesive for surface coating of wood and bamboo based products.

17. Development of fire retardant flush door through construction concepts.

18. Development of alternative preservative treatment procedure for marine/shuttering grade plywood.

B. Sponsored projects:

1. Efficacy of new preservative termi-guardsuper power.

2. Evaluation of wood preservative "Protecto" against mould, termites and borers for solid wood and plywood by glue line poisoning – Sponsored by M/s. Deepak Nitrite Ltd., Pune.

3. Development of flattened Bamboo composites and laminated bamboo lumber products.

4. Development of Bamboo Mat Compreg which meets the requirement of RDSO – Sponsored by M/s. Nano Steel, Guwahati, Assam.

5. Development of wheat straw pulverized board to meet the properties as specified by the sponsor - M/s. Vardhman Industries, Sitarganj, Uttarakhand.

6. Formulation of draft standard for BWP grade bamboo mat composites for exterior applications - Sponsored by National Mission on Bamboo Application, Technology Information, Forecasting & Assessment Council(TIFAC) and Department of Science & Technology (DST), Govt. of India

7. Formulation of draft standard for flattened bamboo board - Sponsored by National Mission on Bamboo Applications(NMBA), Technology Information, Forecasting & Assessment Council (TIFAC),Department of Science & Technology (DST), Govt. of India.

8. Development of technology for the manufacture of corrugated sheets from coir non woven felt.

9. Energy efficiency in Bamboo Based Housing- Sponsored by MNBA, New Delhi.

Following are the New Institute Projects approved by RAC:

1. Development of fire retardant particle board.

2. Evaluation of synergistic effect of metal chelletes with wood preservative chemicals in wood preservative.

3. Development of soya based resin for manufacturing of plywood.

RAC has suggested to modify and re-submit the following two research project proposals during forthcoming RAC meeting

1. A Study on properties of juvenile wood in plantation grown timber and its suitability for plywood manufacturing.

2. Development of fire retardant cum preservative coating of wood based panel products and bamboo composites.

The following new sponsored projects were ratified by RAC:

1. Evaluation of wood preservative – PILOT chemical against wood destroying fungus, termite and borer for plywood by glue line poisoning.

2. Suitability of plantation grown timber species received from Tamil Nadu for the manufacture of particle board – Phase IX.

3. Upgradation of facility for commercialization of Bamboo Mat Corrugated Sheet (BMCS) with addition of Bamboo Mat Ridge Cap.

4. Development of 25mm and 50mm compregs using dyed veneers of plantation species (Densified Laminated lumber) Sponsored by M/s. Indeutsch International.

5. Life Cycle Assessment of plywood and bamboo composite products – Sponsored by CT division of MoEF, Govt. of India.

6. Study on the emission of gases on burning of phenol formaldehyde plywood in boiler.

7. Design and construction of bamboo interpretation centre at Madhya Pradesh, sponsored by MP Forest Dept.

8. Chemical treatment and seasoning of radiate pine timber for CPWD applications.

Shri Bhajanka, Chairman of RAC in his concluding remarks appreciated the new research projects proposed which were the need of the hour for the industries. The meeting ended with vote of thanks to the Chairman, members and other participants by the Director.

EXTENSION

23-4-2010 to 25-4-2010: Ms.Sujatha.D, Scientist attended the regional workshop on "Bamboo industry in South India: Structure, Function and People" at Kerala Forest Research Institute, Peechi.

27-4-2010 to 20-1-2010: Shri. Anand Nandanwar, Scientist visited IPIRTI centre, Mohali for preparing the lab for NABL accreditation and training the staff for fire testing.

22-5-2010 to 25-5-2010: Dr. S. K. Nath, Joint Director Visited Beijing, China to attend "International Seminar on Standard and Certification on Bamboo and Ratten for Developing Countries".

24-5-2010 to 25-5-2010: Mrs Mamatha.B.S, Scientist attended two days training programme on DSC (Thermal Analysis) at M/s. Waters India Pvt. Ltd,Bangalore.

29-5-2010: Shri Amitava Sil & Shri S.C.Sahoo, Scientists, Field Station, Kolkata visited M/s. Timtech Pvt. Ltd. Kolkata for discussion on Technology transfer of "Self adhesive core veneer" project.

29-5-2010: Dr.C.N. Pandey, Director participated in the CAC meeting for the NAIP bamboo project at Civil Engineering Meeting hall, IITD, New Delhi

14-6-2010: Shri Narasimha Murthy, Scientist visited project site in IISc campus for testing the wooden door frames.

14-6-2010: Shri. Kiran MC, Scientist visited M/s BISS, Peenya Industrial area, Bangalore to see servo hydraulic testing system available for dynamic/ cyclic loading of panel products.

23-6-2010 to 24-6-2010: Dr. C.N. Pandey, Director visited Periya pattanam, Mysore to attend a meeting called by the farmers association and plywood representatives.

FINANCIAL ASSISTANCE TO IPIRTI, BANGALORE BY M/S. i-GATE GLOBAL SOLUTIONS LTD., WHITEFIELD, BANGALORE TO RAISE PLANTATION FOR THE PROTECTION OF ECOLOGY & ENVIRONMENT

The Chairman, IPIRTI in one of the earlier Board of Governors meeting held at Paryavaran Bhavan, MoEF, New Delhi, suggested to create linkages among IPIRTI, Forest Departments and Wood Based Industries in order to ensure sustained availability of raw material to the wood based industries in future.

As a follow-up action, IPIRTI has arranged an Interactive Meet involving Karnataka Forest Department and South India Plywood Manufacturers Association (SIPMA) on 14th May

Mr. Chella Namasivayam, CIO, i-Gate Global Solutions Ltd. handing over cheque to Dr. C. N. Pandey, Director, IPIRTI

2010 at Aranya Bhavan, Malleswaram, Bangalore to identify suitable fast growing species for plywood and panel industries. *Melia dubia* has been identified as one of the fast growing timber species and the same was tested at IPIRTI, Bangalore and found suitable for plywood and panel products. Realizing the non-availability of quality planting in large scale, IPIRTI has decided to provide nearly one lakh *Melia dubia* seedlings to the farmers of Periya Pattanam, Karnataka for plantation.

In this connection, one of the leading IT Software Company M/s. i-GATE Global Solutions Ltd., Whitefield, Bangalore has provided initial financial assistance of Rs. 5 lakhs to undertake the propagation of *Melia dubia* seedlings under the Scheme "Social Corporate responsibility for the protection of ecology and environment". The sourcing for seedlings of *Melia dubia* will be made from Karnataka Forest Department.

TRAINING

PGDC Course:

One year Post Graduate Diploma Course in Wood and Panel Product Technology for the 21st Batch of Trainees is under progress.

Short Term Training Courses:

Training Course on "Testing of plywood and block board" was conducted at IPIRTI Centre, Mohali from 5th -9th April, 2010.

Training course on "Resin manufacturing" was conducted at IPIRTI Field Station, Kolkata from 19th -23rd April, 2010 and 26th -28th April, 2010.

A Special Training course on "Saw doctoring" was conducted at IPIRTI, Bangalore from 24th -26th April, 2010

Training Course on "Retention of preservative chemicals" was conducted at IPIRTI Field Station, Kolkata from 17th -21st May, 2010.

Training Course on "Testing of fire retardant plywood" was conducted at IPIRTI Centre, Mohali from 4th -5th May, 2010.

Training Course on "Testing of plywood, block board and flush door" was conducted at IPIRTI Field Station, Kolkata from 21st -25th June, 2010.

CALENDER OF SHORT TERM TRAINING COURSES AT IPIRTI, BANGALORE, AUGUST - DECEMBER, 2010

Sl. No.	Title of the Training Course	Duration	Date	Fee (Rs.)
1.	Plywood manufacturing - II Economic, Adhesives for plywood and plywood manufacturing (Resin manufacture, gluing, hot pressing)	5 days	16-20 Aug	5000
2.	Low cost & specialty resin for the manufacture of Plywood	5 days	15-17 Sept	5000
3.	Floor level problem and Trouble shooting in plywood manufacture	2 days	8-10 Nov	2000
4.	Block board and flush door manufacturing	5 days	13-17 Nov	5000

CALENDER OF SHORT TERM TRAINING COURSES AT IPIRTI FIELD STATION KOLKATA, JULY - DECEMBER, 2010

Sl. No.	Title of Training Course	Duration	Date	Fees (Rs.)
1.	Testing of Phenol, Formalin & Estimation of Nitrogen	3 days	26-28 July	3000
2.	Testing of Flush Door	3 days	16-19 Aug	3000
3.	Plywood Manufacturing	3 days	13-15 Sept	3000
4.	Preservative treatment of wood & wood based panels	2 days	22-24 Nov	2000

CALENDER OF SHORT TERM TRAINING COURSES AT IPIRTI CENTER MOHALI, SEPTEMBER - DECEMBER, 2010

Sl No.	Title of Training Course	Duration	Date	Fees (Rs.)
1.	Testing of plywood and block board as per IS:303, IS:710, IS:1328, IS:4990 and IS:1659	5 days	6-10 Sept.	6750
2.	Testing of Flush door and block board as per IS:2202 and IS:1659	5 days	1-5 Nov.	6750

SUPERANNUATION

Smt. Sudha Paulraj, PS to Director, retired on 31st May, 2010. The Institute acknowledges her contributions especially in Secretarial work rendered.

IPIRTI wishes her a Happy & Peaceful Retired Life.

IPIRTI, P. B. No. 2273, Tumkur Road, Bangalore - 560 022, INDIA, Telephone: 28395970, 28394341(Director), (General) 28394231-32-33 (PABX)
Fax: 91-80-28396361, E-mail: contactus@ipirti.gov.in, websites: http://www.ipirti.gov.in, bamboocomposites.com

President-IPIRTI Society, Minister for Environment and Forests, Govt. of India — **Shri Jairam Ramesh**
Chairman, Board of Governors - Secretary, Ministry of Environment & Forests, Govt. of India — **Shri Vijai Sharma, *IAS***
Director & Principal Executive Officer — **Dr. C. N. Pandey**

Editorial Team :

Editor: Smt. Ravikala Kamath
Associate Editor: Smt. C. S. Lalithamba
Members: Shri K. Thanigai and Shri Jagadish Vengala

Graphics & Layout: *Shri. Ashok Kumar A.C.*
Photographs *Shri. H.H. Thippeshappa.*

Supervision and Guidance : Dr. C. N. Pandey, Director, IPIRTI, Bangalore