



Editor's desk



We take immense pleasure in launching the very first Indian news letter on WPC sector. At this stage we thank India for showing a great speed in implementing the global subject of WPC, faster than any other product in the wood industry. This news letter is an effort to bring technologies, customers, suppliers and subjects on a common platform. We have enough faith that WPC shall be the next generation global industry for India.

This volume includes Dr. S. S. Naik, Reliance writing on PVC versus Wood for forest conservation, Vishwas Sonigara speaks on Moisture issues accompanied with company introduction of world giant TREX. Sachin Shah and Kauser Indorewala introduces their leadership brands. Entire team of Hardy Smith welcomes Indian WPC players for sharing this platform for a visionary growth.

Niyati Panchal,
Business Manager, Hardy Smith.

Headline news

Battenfeld-Cincinnati, Austria joins hand with Hardy Smith, India for Wood plastic composites technology business.

India is being evolved as the largest consumer market for wood plastic composite products. With its continuous growth in interior, furniture and wood segments the country is emerging as a potential player in the world with rapid acceptance and spread of WPC concepts.

World's largest WPC technology player Battenfeld-cincinnati, Austria has joined hands with Hardy Smith, India for supporting the high end technology demands for Indian markets. Recently the agreement has been confirmed between both the players for creating a synergy for technology markets of India. This co-operation envisages a strong sector establishment in support to the back ended associations like Wood K Plus, TCKT and Gruber.

Battenfeld-cincinnati is a market leader in extrusion technology that develops designs, manufactures and distributes innovative, high quality extruders and extrusion equipments. As a global player, Battenfeld-cincinnati has 5 production sites in Austria, Germany, China and USA. Battenfeld-cincinnati has been serving the WPC industry for more than 15 years and placed more than 250 tailor-made WPC lines worldwide.

After successful completion of 5 WPC lines' consultation, Hardy Smith is ready for catering to the turnkey project demands into wood plastic composite sector with Local and European machines.

Industry speak

PVC – Attributes toward Wood replacement & Forest Conservation

India

India is one of the fastest growing economies of the world. With the growth of economy, Construction sector is also witnessing rapid growth since last several years. With that the sector is consuming several materials including wood and wood based materials. As per India State Forest Report 2011 by Forest Survey of India the country has lost about 367 sq. km of forest cover in the past two years. Total forest cover in the country stands at 6,92,027 sq. km, which accounts for ~ 21% of the total geographical area of India against target of 33%. Wood and wood based materials are used in Building and Construction sector for various applications like doors, windows, fencing, siding, railing, cabinets, furniture, partitions, shuttering etc. However, with the concern about depleting forests and the environment, wood-alternatives are increasingly being used in these applications.

PVC - an infrastructure plastic is the proven alternative to wood. About 35% of global consumption of PVC is used in Building and construction applications. Globally PVC windows have ~ 55% share of the total windows sector. Due to low thermal conductivity PVC windows provide thermal insulation equivalent to wood. Due to welded joints these windows provide additional benefits like sound insulation and zero rainwater ingress. Studies analysed that PVC windows not only save energy over their life cycle but also reduce emission of greenhouse gases. Similarly PVC doors provide longer life during usage. PVC furniture is more durable compared to wood furniture as it is not attacked by termites. Due to inert nature PVC products, they do not require any maintenance like painting or varnishing. PVC sheets can also be used very well in shuttering applications as they do not chip, swell or peel. Due to thermoplastic nature of PVC, these products can be moulded in any shape and size which provides design flexibility to architects.

Wood filled PVC products have made inroads in building & construction sector. Here, wood flour provides wooden finish to the product while PVC adds strength and inertness to the products. Wood PVC composites can be cut, nailed, screwed, glued, and routed like wood. These properties make them useful for various products including furniture, siding, shuttering, railing, partitions. Wood PVC composites also have potential in industrial applications like industrial lumbers, pallets etc. Green Building concept is growing at fast pace in India as well. PVC products are used in Green Buildings across the world due to their potential to meet the necessary requirements. While meeting the entire end use application requirement, the PVC products save energy and environment at every stage of their life cycle! Not only these products can be easily recycled, but at the end of their life can be converted into fuel!!

India hosted World Environment Day in 2011 for the first time ever. The honour was bestowed upon India, being one of the fastest growing economies in the world that is embracing the process of a transition to a Green Economy! PVC products would be leading contributors towards achieving the goal. It is our humble appeal to construction industry and end users to use sustainable materials to save energy, environment and the scarce natural resources of the country.

S. S. Naik, Sr. Vice President, Reliance Industries Ltd.

Applications

WPC boards in kitchen carcasses



Modular furniture segment in India is one of the biggest upcoming sectors. Moving equally parallel to the fresh thoughts of Indian young minds, Modular kitchen industry also is becoming a popular subject. There are brands like Godrej, Nolte, Kassebohmer has taken leadership and after those there is a big brand gap without followers at state levels. We forecast a series of new brands in Modular kitchen industry in coming days.

Popular raw materials for kitchen carcasses and shutters are marine plywood & MDF with HPL or PU or Paint surfaces. Indian kitchens are facing delamination, termite, decay and reshaping problems because of two effective reasons: (1) Use of free water in washing and floor cleaning, (2) High moisture contents in air and soil. These reasons make the Kitchen furniture a colony for termite at times.

WPC board is the most effective solution for such moisture and termite issues in modular kitchen applications. Carcasses and shutters made with high quality WPC boards can be termed as a life time investment in furniture by Indian middle & lower middle class.

Carpenter's corner

Gluing of WPVC

WPVC is an important composite product made with Poly vinyl chloride. PVC is the material which has good and positive tendency towards surface enhancement. Thus, WPVC boards and WPVC profiles can be painted, coloured, coated, varnished and laminated with different surface materials.

There are different adhesives available for WPVC surfaces from different companies including Pidilite Industries. High pressure laminates, Veneers and other decorative surfaces can be laminated by Fevicol SR Express, Fevicol SP5 and SP6 type of adhesives. This adhesives can be used for manual pressing and Cold pressing applications of boards and surfaces.

For jointing applications PVC solvent cements are also available and which can be used for rapid jointing. There are some other adhesives like Dendrite supreme from Chandra chemicals, Kolkata are also being used.

Kirit H. Dave, Director, Madhuri Furniture

WPC Boards



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Technology

Formulation-a most critical aspect

The most critical aspect of any polymer manufacturing process is the formulation. It becomes for important, in case of composite, where two chemically different materials are involved and same is the case for wood plastic composite.

When wood or any other natural fiber is mixed with polymer, it affects rheology of polymer to the great extent due to the poor inter-facial adhesion between polymer and wood. This can be improved with the use of specific chemicals, known as coupling agent. Even after the use of coupling agent, the problem cannot be resolved completely, as polymer tends to flow at high temperature and wood particles restricts the flow. To overcome this difficulty variety of lubricants are necessary.

The selection criteria of lubricants depends on multiple factors such as polymer, type of coupling agent, processing parameters etc. Polymer, being sensitive to effect of atmosphere, variety of heat stabilizers, anti-oxidants, UV stabilizers always remain as a part of formulation. Apart from above mentioned chemicals, special purpose additives, such as product aesthetic additives, foaming agents, flame retardants are frequently employed depending upon the application requirements.

The composition of above chemicals has several considerations like, effect on polymer, processing parameter, application requirement, effect of other compounding ingredients and quality of materials. This makes the formulation the most critical aspect of WPC manufacturing.

Hardik Panchal, MD, Hardy Smith

Global players

TREX, Virginia, USA

Trex Company is the world's largest manufacturer of wood plastic composite decking and railing, markets their products under the brand name Trex®. The company was formed in 1996 through the buyout of a division of Mobil Corporation and went public in 1999. Trex is headquartered in Winchester, Virginia, with manufacturing facilities in Fernley, Nevada and Winchester, Virginia.

Trex® turns millions of pounds of recycled and reclaimed plastic and waste wood each year into Trex products. Most of these raw materials come from recovered plastic grocery bags, plastic film, and waste wood fiber. Trex Company purchases approximately 300 million pounds of used polyethylene and an equal amount of hardwood sawdust each year, materials that would normally end up in a landfill. The company recycles over 1.3 billion grocery retail bags annually.

For more detail, log on to www.trex.com.

Raw materials

Polymers and natural fibers in WPC

Wood Plastic composites are extruded or molded products of specified shape and by generic definition it represents a structure with plastic filled by cellulose fibers and other ingredients. Wood is acting as a core filler material for wood plastic composites. In WPC, Polymer forms continuous phase, which encapsulate wood particles. These matrix polymers are generally low cost, commodity polymers which can flow easily upon heating, absorb very little moisture and can be effective moisture barrier in a well-designed composite.

Wood itself contains polymers, such as lignin, cellulose and various hemicelluloses. Wood is less expensive, stiffer and stronger than synthetic polymer. It readily absorbs moisture and tends to biodegradation, if not protected.

Only thermoplastics are applicable in WPC, those can be processed below 200 deg C and this is due to limited thermal stability of wood. Today the global market is mainly producing WPC from commodity polymers such as Polyethylene (PE), Polypropylene (PP) and Polyvinyl Chloride (PVC). In North America, the majority of WPC use Polyethylene (PE) as matrix, apart from other plastics such as Polypropylene (PP), Polyvinyl Chloride (PVC). Polypropylene is widely used in Europe. PVC is widely taking up in Asian region with products like boards and interior profiles.

Darshan Shah, Technical Director, Hardy Smith,

Wood industry speak

Moisture issues with furniture in India

India is a country with the heavy moisture regimes starting from central west region to southern and south east regions. Moisture content in the air and soil both are dangerous for wood products and furniture. Hygroscopic nature of wood, particle boards, MDF boards and plywood attracts water contents from Air, especially in monsoon session. This directly affects to the adhesion of furniture panels e.g. mother boards, high pressure laminate and glue are getting delaminated with each other. At the same time during winter season, dry winds affect the furniture due to contraction phenomenon and similar issues can be observed.

Apart from this building gets moisture from the earth through capillary suction mechanism and transfers this moisture to the furniture tangential to that surface. These critical effects supports to the termite development also. Wood plastic composite can be a great substitute for such weather conditions in coming days for India.

**Arvind Patel, Director, Annapurna Timber Company
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Indian Player

Plamadera composite is the leadership organisation in indian WPC industry. With a state of the art facility at Ahmedabad, company is manufacturing WPC boards and WPC profiles as their core products.

WPC boards by plamadera has different variants like plain WPC boards, Color WPC boards, 3 layer WPC boards, PVC foam boards and most special is mineral WPC boards. Mineral WPC boards is the most premium category product having more than 800 kg/cum density and can be used for heavy load bearing applications like shuttering or construction templates.

WPC profiles by plamadera has three major variants as of now including WPC flooring, WPC wall cladding and WPC colour panels. WPC flooring can be used for beautiful indoor application in homes, hotel and office premises. WPC wall cladding can be used for wall decorations. WPC colour panels are unique decorative panels which can be used in many generic applications like vertical decorative panelings, hotel & restaurant furnitures, high end hospitality segments and typical office decorations also. Plamadera is coming up with WPC door frames as its new product segment soon. For further details kindly log on to www.plamadera.com

Sachin Shah, MD, Plamadera composite.

Insights

Brief history of WPC

In the last 50 years, WPC Industry in establishment is noticed as its five stages as follows:

- 1) Development of Thermoset Composite during World War II. The first reported use of wood flour was in Bakelite in 1920s and used for industrial applications.
- 2) Transition of Thermoset wood Composite to Thermoplastic wood composite and realization of importance of uniform mixing of cellulose fiber with plastic.
- 3) Improving the Mechanical properties of WPC as key properties for building and construction materials.
- 4) Improving the compatibility of cellulose fillers with polymer matrix by providing interaction through coupling agent
- 5) Further improving properties of WPC by using plastics other than PE such as PP, PVC, ABS.

Indian Player

PS Wood is the first wood plastic composite brand for the Indian Market. PS Wood WPC decking has more than equivalent strength, toughness, water resistance and aesthetic appeal and it's a totally recyclable product helping the environment to conserve.

PS wood WPC has absolute properties like insect resistance, fungi resistant, ease of molding and water resistance at the same time it takes in all the properties of wood like ease in working, wood like effects and feel, resilience effect and is anti-slip.

PS Wood WPC is the ideal material as exterior decking's, fencing, cladding, artistic railings and gazebos. A responsible initiative is taken by PS Wood to educate the customers with the finer points of post installation benefits, the chronic effect of long term maintenance and the extra burden it has on the costing. PS Wood ensures a maintenance free product and gives a cost per rupee evaluation for 15 Years.

PS Wood has taken many initiatives in exploring the various fields of application where it can be used. Green house walkways, Prefabricated Farmhouses, rustic grills and garden benches-ensuring the perfect customer requirements. This material can truly be called a futuristic material a wand in the hands of the wizard.

Kauser Indorewala, MD, PS Wood

News lines

Johnson Controls, a global leader in automotive seating, interiors and electronics, is providing a series of innovative door panels, for the new BMW 3 Series. The non-visible door panel elements for the new BMW 3 Series sedan and sports wagon models are largely made of wood fiber. The natural fiber carrier is directly molded with plastic, This innovative production method makes the door panel 20 percent lighter. (Source: news.thomasnet.com, May-2012).

Forestry products producer Weyerhaeuser in Federal Way, Wash., has introduced a proprietary, patent-pending thermoplastic composite with cellulose-fiber reinforcement derived from wood. The company is working with Ford Motor Co.'s biomaterials research team to examine automotive applications where plastic composites made with cellulose fibers can replace thermoplastics with fiberglass or mineral reinforcements. (Source: Plastics Technology, Dec-2012)

Events

WPC	Wood	Plastics
Wood-Plastic Composites 2013 , Location: Austria Trend Savoyen Hotel, Vienna, Austria Date: 25-27 February, 2013, www.amiplasticsna.com/events/Event.aspx?code=C493&sec=2920 6th International Conference on Industrial Biotechnology, Bio-based Plastics and Composites, Location: Maternushaus, Cologne, Germany, Date: 10-12 April, 2013	Delhiwood 2013 , Location: India Expo centre & Mart, Greater Noida, India Date: 31 January – 3 February 2013 www.delhi-wood.com Woodtech India 2013 , Location: Bombay Exhibition Centre, Mumbai, India, Date: 13-16 June 2013 www.woodtechindia.in	Arabplast 2013 Location: Dubai / UAE Date: 7-10 January, 2013 www.arabplast.info Plexpoindia 2013 , Location: Gandhinagar, India, Date: 8-13 January, 2013 www.plexpoindia.com