

INDIA'S 1ST & ONLY 'ARCHITECTURE & INTERIORS MATERIAL' MAGAZINE!

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R E P O R T E R

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Focus:

PANELS & SURFACES

WPC: Powerhouse of Possibilities!?

Blurring Boundaries: Real & Man-made products

Going high: Wall Highlighters

Top 11 Flooring Innovations

50+ exclusive designs inside

A Metal's monologue

Overview: Bath & Kitchen at KBIS

Exclusively shared with Surfaces Reporter:

THE CRESCENT
BY SANJAY PURI ARCHITECTS

A sculptural office design at Surat with
CORTEN STEEL as the main facade material



WOOD PLASTIC COMPOSITES

WPC, the material, current status, possibilities and some burning questions which are yet to find answers!

Wood is one of the most versatile surface materials that can be used for varied applications. Due to its naturally warm and pleasant feeling, wood has been the first love of architects and designers all over the world. However, the growing concern over environment led to the development of many alternatives of wood. One such material is WOOD PLASTIC COMPOSITE (WPC). The material had a humble beginning as an alternative choice for decking. But as the years passed, it matured and is now being used widely for wall claddings, indoor-outdoor furniture, sidings, pergolas, doors etc. With the growing popularity of the material, SURFACE REPORTER® decided to probe a little deeper to ascertain its properties, possibilities and probable future.

MATERIAL'S BEGINNING

WPC is said to have been invented in Japan about 30 years ago as a substitute for wood made from softwood waste and recycled polymer resins by EIN Engineering. As the name suggests, Wood Plastic Composite is a combination of wood flour powder, saw dust, fibre fillers like pulp, hulls & bamboo and thermoplastics, which mostly include new or waste plastic from materials such as polyethylene, polyvinyl chloride, polypropylene etc. Polyethylene based WPCs are by far the most common. Additives such as colorants, coupling agents, UV stabilizers, blowing agents, foaming agents, and lubricants help tailor the end product to the target area of application.

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MAKING OF WPC

Wood Plastic Composites (WPC) are produced by thoroughly mixing ground wood particles and heated thermoplastic resin. The most common method of production is to extrude the material into the desired shape, though injection moulding is also used. **Extruded WPCs are formed into both solid and hollow profiles.**

The first extruded forms of the material were solid boards, however, later on, hollow profiles were also developed. The boards became lighter, tougher and easier to install, making it possible to enlarge the cross section and in turn the load bearing capacity. A large variety of injection moulded parts are also produced, from automotive door panels to cell phone covers.

In some manufacturing facilities, the constituents are combined and processed in a **Pelletizing Extruder**, which produces pellets of the new material. The pellets are then re-melted and formed into the final shape. Other manufacturers complete the finished part in a single step of mixing and extrusion.

Foam extrusion is another innovative technology, wherein composition of special resins allows the boards to weigh as little as possible while retaining all the qualities of durability and high mechanical resistance exhibited by hollow profiles. Extruded foam WPC is ideally suited for high quality thermal and acoustic insulation of facades besides other application.



Outdoor Deck floor by Indiana

MS. GAYATRI, MD, INDIANA INTERNATIONAL CORPORATION FLOORING PVT. LTD.

www.indiana.co.in

PROPERTIES & FEATURES OF WPC

■ **Wood Plastic Composite (WPC)** deck flooring consists of 45% of highly selected wood flour and 45% of pure PVC. Additives, improving the characteristics of the product, are 10% of the raw material composition. The combination of wood with plastics ensure formation of a durable material that preserves its high performance characteristics for many years without the need for maintenance, oiling and painting, resistant to water and changing weather conditions.

■ **Durability:** The WPC composite technology ensures durability and the highest resistance. The deck flooring is resistant to abrasion, external mechanical forces, weathering and biological agents, salt water and chlorine. It does not require maintenance and service work, so that you can save time and money.

■ **Versatility:** The use of composite WPC is broad: from balconies through pool and pond borders, along with sailing piers.

■ **Aesthetic appearance:** The material is perfectly straight, free of knots and cracks, in addition to non-deformable and non-bulging. With mounting clips, there are no visible screws and nails, which improve aesthetics.

■ **Color depth:** Through the use of high quality pigments and UV filter additive, developed in collaboration with renowned world producers, unprecedented colour depth is obtained in our WPC products.

■ **Co-extrusion:** Co-extrusion or multi-layered product is an innovative technology that offers both superior dimensional stability of the product, as well as colour stability. The individual layers contain special additives: the inner layer, apart from the highly-selected wood flour and pure PVC, contains an admixture of components which increase deck flooring's strength parameters, while the outer layer, using the company's long-term experience, contains additives that increase resistance to sunlight (UV).

■ **Do not require maintenance or painting:** The deck flooring does not require any impregnation, and yet they do not lose their properties over time.

■ **Safety in use:** The surface of the WPC is grooved on both sides. With grooves running lengthwise along the deck, draining water from the surface is done quickly and efficiently. You can walk on WPC without slipping even when they are wet.

■ **Unusual visual qualities:** Through the use of the latest advanced processing techniques of materials, we have obtained a perfect brushing effect of the composite deck. It perfectly imitates real wood.

■ **Incombustibility:** The product is made of non-combustible and safe material which is suitable for universal use. It has the highest possible fire reaction class Bfl – S1. It is a European product.

■ **Environmental performance:** They are environmentally friendly, have all the necessary approvals and can be recycled.



Outdoor decking by Indigo Enterprises



WPC used for building facade application

“Let’s face it -wood deteriorates. It cracks, it rots, its splinters, and the list goes on. As an organic material, it is a breeding ground for bacteria and a hearty meal for termites and other insects. From an environmental standpoint, wood cannot be recycled, and its production leads to deforestation.”

**GANESH. M, CEO, E3 EXTRUSION INC
ALTERNATIVE FOR WOOD – WPC, BENGALURU**

www.e3extrusion.com

*E3 Extrusion Inc. (Trade name **E3 WOOD** – Eco-friendly, Effective, Elegant) is a manufacturer of Wood Polymer Composites (WPC) in Bangalore.*

Rare trees in tropical rainforests require several decades to reach full maturity. Wood has been a standard building material for centuries. However, with the rise of global warming and deforestation, wood-alternatives are increasing in popularity and use. Thanks to modern technology, we have been able to create a product that will decrease the need for wood materials. WPC can be Recycled. WPC is a blend of waste wood / waste natural or agricultural waste and virgin or waste plastic. It an alternative of Wood!

WPC is Water resistant, Termite resistant, Recyclable, Good nail retention, high Colour stability, Paintable, Polishable if required and it is suitable for both Exterior and interior applications.



Sanjay Gulvady
Managing Partner,
Indigo Enterprises, Chennai
www.everwoodwpc.com

SANJAY GULVADY, MANAGING PARTNER INDIGO ENTERPRISES, CHENNAI (EVERWOOD)

Introduced in 2011, Everwood (a brand of Indigo Enterprises) offers 18 profiles in 6 colours for external Wall Cladding, Deck Flooring, Pergolas, Railings, Louvers and other applications.

WPC MARKET IN INDIA, QUALITY, INTERNATIONAL BRANDS AND EXPORT

WPC as a material was introduced in India only 10 years back and at the time applications were limited. When Everwood was introduced in 2011, awareness about WPC was still non-existent and we were one of only a handful of branded WPC available.

WPC manufacturing in India is still in its infancy stage when compared to overseas production. Domestic manufacturers who started manufacturing 5-6 years back didn't understand the need for high quality raw materials and products failed. Today, with the availability of imported raw material, products are more stable in our demanding weather conditions. Manufacturing in India will evolve very fast with collaborations and it's a matter of time before we are producing high grade WPC.

Brands like TREX from the US and Einwood from Japan are world leaders simply for their quality & innovation. We are behind international grade WPC producers in Korea and China whose core competency is manufacturing and quality. Their products are a result of highly evolved manufacturing technology and product research. China is the largest manufacturer of WPC today with over 70% of their production being exported.

“WPC will become a ‘compulsory’ material for carcass applications in near future. We are projecting a total of 100 lines during 2016 in India.”

HARDIK PANCHAL, DIRECTOR, HARDY SMITH, AHMEDABAD

WPC MARKET, ITS GROWTH IN INDIA, AND MAJOR PLAYERS

WPC as a subject was launched during 2011, officially with a few players during the first year. HARDY SMITH brought this subject into action during this year with its very first three projects DURAPLAST, PLAMADERA & LIRCO. At the same time EWOOD, ECHON and TEXPLAS was serving to the market. Initial players took enough pain to set the material with their machines. Availability of raw materials and chemicals took almost a year to settle down from the country. But all these players did a good job in spreading the product across the wood and allied markets. Samples of WPC sheets and profiles reached up to Plywood counters and people started taking interest in the products.

Today, there are set players in the market, although they are mid-size as of now but they have already expanded their capacities. Echon is a major player with largest capacity in WPC boards and doors. Plamadera is one player with boards and Door frames. Alstone is a player with more than 4 board lines and Oligo UV coated WPC panels. Similar capacity is followed by Duraplast with an Edgeband making line. Century ply also has started promoting and supplying WPC products in the market with brand name HECTOR. WPC CENTRE also is an entity that is supplying total WPC products and applications for interior and exterior segments. **WE ARE PROJECTING A TOTAL OF 100 LINES DURING 2016 IN INDIA.**

Logically, the country has seen a continuous growth in last 5 years with at least 12 new players every year. There are many dealers and distributors now those are stocking and selling WPC boards and door frames. There is a parallel growth seen in WPC door frame markets too and now WPC decking is picking up through architect channels at a rapid pace. A specific annual growth of WPC market as per HARDY SMITH is rated around 25%.



Hardik Panchal, Director
Hardy Smith, Ahmedabad
www.hardysmith.org



Sameer Srivastava
VP, Ocean Thermoplastic
Elastomers Pvt. Ltd.

www.oceangrouponline.in

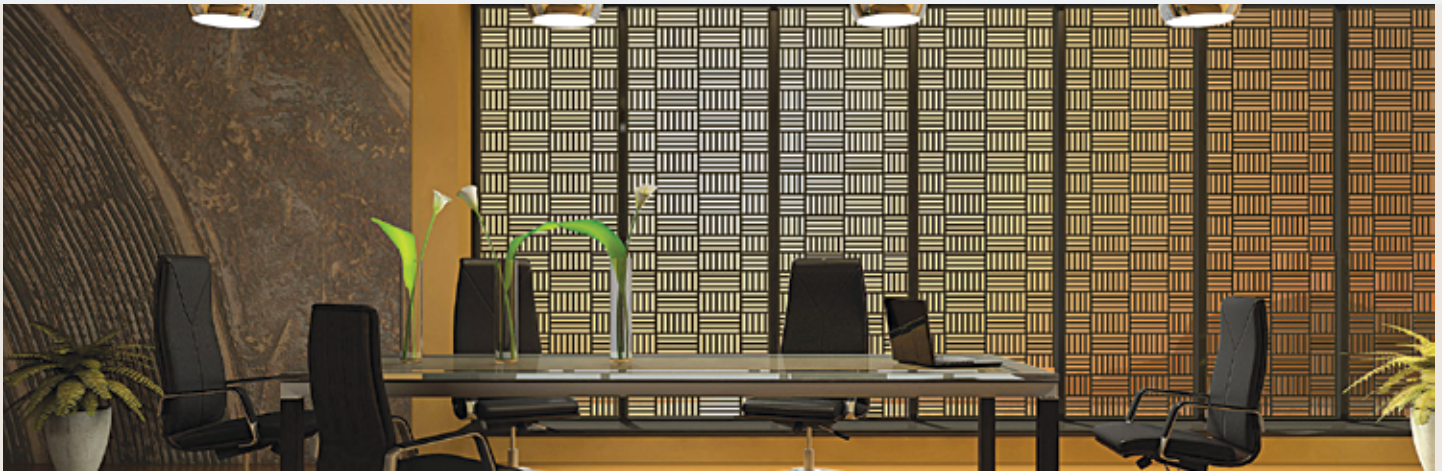
SAMEER SRIVASTAVA, VICE PRESIDENT OCEAN THERMOPLASTIC ELASTOMERS PVT. LTD. (WOODTEC)

PRICE RANGE OF WPC

WPC is just a material. The price range depends upon the product made by the material. Currently, WPC is available in numerous forms, i.e., from normal boards to designer doors, flooring, cladding, it has numerous application. So price range also depends upon it. The highest selling item would be an 18 mm thick WPC Board which cost something around Rs. 110/- per sq ft.

QUALITY CONSIDERATION OF WPC

Higher the density, the better will be the product. The screw holding capacity, the resistance capacity and flexural strength all depend upon the density of WPC material. The minimum density required for a good quality WPC is .60 gm/cm³.



“WPC has a much better and wider scope in the plywood market due to its various features over conventional available boards – the main being water proof, termite and borer and insect proof and fire retardant features. It will be the people’s choice in the coming few years. WPC will be the face of the wood applications.”

PAWAN GARG, MANAGING DIRECTOR ALSTONE INDUSTRIES PVT. LTD.

www.alstoneindia.com

A manufacturer of Wood Polymer Composite, the product range includes WPC Board, WPC Art and WPC Doors. Alstone has launched Oligo recently. It comes in various choices and designs in High gloss and Matt finish. One can choose any wooden, marble or flower design over WPC boards and later can have it in High Gloss, Matt and Texture Coating.

MARKET SHARE

Today WPC has a market share of approximately 0.7% of the total plywood market. The number may not seem large but for a product that has come in the market just a few years ago, it is a big achievement. It shows that this material has been successful in breaking the traditional mindset of customers to look for something better than Plywood.

QUALITY OF WPC IN INDIA

Quality is a major issue in the WPC manufacturing. There are very few quality WPC board manufactures. 70 % of the total players are in producing under quality material.

This approach of giving under quality material to customers is killing the material’s future scope and growth.

DESPITE BEING A PLASTIC COMPOSITE, WHY IS WPC CALLED A GREEN MATERIAL?

Very well said, despite being a Plastic composite, WPC is called a green Product. The WPC is not just Plastic, it is Wood Polymer Composite. To understand this we need to look into two aspects – its raw material and its destruction. In WPC manufacturing, wood is not required so the need to cut trees and destroy greenery is itself eliminated. Secondly the products made by WPC have a longer shelf life than usual Competitor materials due to the various features it has. It goes on for years without much maintenance and wear and tear. And when it is replaced because of any reason, it can be converted into plastic chips through grinding and is again ready to be used in another form. Thus it is non -biodegradable but it is recyclable and reusable. Thus, WPC does not deplete the environment of its natural resources unlike other materials and hence is known as a Green Product. Further, we are also working over our technologies and R&D to find an alternative to the PVC which is being used at present.

“Manufacturing of WPC in India has a number of technical limitations. Till now, there is no defined quality aspect, licensing or regulation for making WPC products, but the importers already have some specifications which the Indian manufacturers have to follow as those are well-known by the Indian customers. Still, I would say that when the competition will be healthy, the quality points will be checked thoroughly & this will improve the standards of this Product at manufacturing level.”

**NIKHIL CHOUDHARY, DIRECTOR
SUCH IMPEX PVT. LTD. (VICTOR FLOORS)**

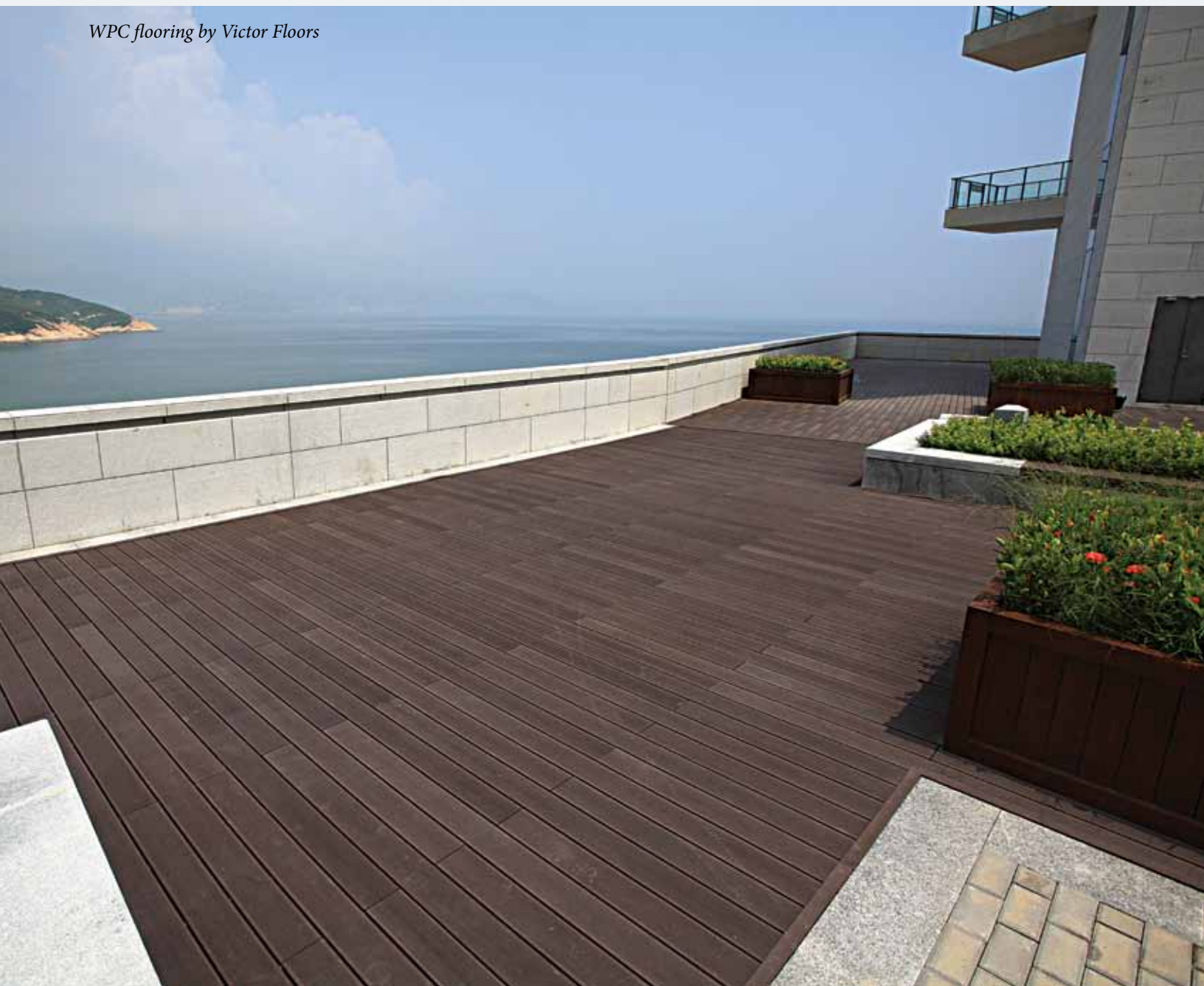
www.victorfloors.com

APPLICATIONS OF WPC

■ **Indoor:** WPC can be used in modular furniture segments like vanities, wardrobe, Kitchens, Bathrooms, Partitions, Doors etc. WPC can be used as a replacement of wood for making customization of product with traditional carpentry skills.

■ **Outdoor:** WPC is widely famous and applied widely in India for Outdoor wall cladding, Floor Decking, Gates, Pergolas, Surrounding swimming pools, fencing, porches and docks, siding, railings, window frame construction etc. WPC has very lower maintenance which is a very key factor. For WPC boards the Frosty white, walnuts & the darker colors are much in, & for Outdoor applications the traditional colors Chocolate, Coffee are much suitable colors.

WPC flooring by Victor Floors



“WPC is used exactly like plywood by the carpenters without the need of any new tools while any other material which is termite and water proof must be handled by the skilled technicians. Market share of WPC is increasing tremendously.”



AJAY GARG, DIRECTOR, ADVANCE POLYMERS, NEW DELHI (E3 WPC)

www.e3panels.com

TESTING AND CERTIFICATION OF WPC

Right now, in India, we don't have a lab facility to test the quality of WPC. Indian government currently doesn't have an ISI certification for the material.

As there are no scientific methods available in India to check the quality, Nail test for surface & Screw test for strength can be done manually.

WHY IS WPC GAINING POPULARITY?

Material Properties and more...

Wood plastic composite commands a fair share in the International market and it is slowly gaining momentum in the Indian domestic market as well. Other than having the looks of wood, WPCs do not corrode and are highly resistant to rot, decay, and marine Borer attack. The WPC panels can be easily shaped using conventional woodworking tools. With a higher flexibility, WPC can be bent and fixed to form strong arching curves. WPC are also available in a wide variety of colours eliminating the need for paints.

Ganesh M, CEO, E3 Extrusion Inc. says, “Let's face it — wood deteriorates. It cracks, it rots, its splinters, and the list goes on. As an organic material, it is a breeding ground for bacteria and a hearty meal for termites and other insects. From an environmental standpoint, wood cannot be recycled, and its production leads to deforestation.”

Nikhil Choudhary, Director, Such Impex Pvt. Ltd. believes that though Price is a bit expensive due to the higher production cost, but still the advantages of WPC go much over the prices.

WPC is precisely economical than plywood and MDF for panel furniture making, as per **Hardik Panchal, Director, Hardy Smith WPC.** He says that any plywood or MDF needs surface protection and majority panels are covered with HPL on both the sides for furniture making. No plywood, MDF, particle board or wood can be used in its natural form. And surface protection in form of HPL, coating, painting or lamination is must. For WPC you don't need any such practice, as it is 100% moisture proof and 100% termite proof. You can directly make Carcasses from a WPC plain board by use of Cyanoacrylate binder. It literally welds to WPVC surfaces.

Thus as per him, it saves surface coating cost, labor cost and time. It is 100% recyclable, thus we sell it with buy back guarantee. Any time in the future, WPC material in plain condition can give equal value to the client at the price he purchased. One can get at least 20% of its money back, if furniture is made with WPC panels.

Being created with wood fibre and having plastic inside, there are suspicions about fire performance of the material. However, tests have shown that fire retardant treatments can reduce the potential contribution of the wood-plastic composites to a fire.

After all these assured cost advantage even the price of WPC boards matches to the cost of marine plywood in plain condition for a retail user. Cost of a WPC solid door matches to the conventional wooden Chaukats and cost of WPC Deck floor matches to the solid wooden flooring.

WPC AND FIRE RATING

We all know that wood supports fire. Being created with wood fibre and having plastic inside, there are suspicions about fire performance of the material. However, tests have shown that fire retardant treatments can reduce the potential contribution of the wood-plastic composites to a fire. Studies showed that increasing the wood fiber content in wood-plastic composites significantly improved the fire performance to that of the plastic alone. As per experts, adding fire retardant chemicals, particularly ammonium polyphosphate, was also shown to be effective in improving the fire performance.

FUTURE OF WPC IN INDIA

WPC has a huge market today with players having great expectations from the future. As pointed out in the article above that with a market share of just around 0.7% of the total plywood market, the number is still encouraging since the material has entered India market recently. This indicates acceptability of the product in general.

Sameer Srivastava, VP, Ocean Thermoplastic Elastomers Pvt. Ltd., says that the future of WPC is bright since there is shortage of wood and in the coming times shortage will continue to increase. WPC is a strong contender in providing a solution to the situation.

Sanjay Gulvady, Managing Partner, Indigo Enterprises feels that looking at the growth trajectory of WPC worldwide, it will continue to follow that trend over the next few years. He foresees tremendous and non-stop growth in the coming years for a wide and innovative range of applications. As Indian firms gain manufacturing experience, quality will improve and with some government support, India can be a big player on the global market. However, the downside will be parity products commoditizing WPC.

In an earlier article of this magazine, **SURFACES REPORTER® has called Wood Plastic Composite (WPC), 'A Powerhouse of Possibilities!'**

However, we will not refrain from the fact that WPC is yet to go through a lot before the tag becomes a reality. There are severe issues related to Quality which is hampering the progress of this product.

There is no way how a common buyer can differentiate, check or compare Quality of two WPC products. Even no testing parameters are set. There is hardly any awareness drive started for this material in a significant level. It is a known fact that once someone experiences

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bad quality, the material gets a bad name forever. Price is on a very higher side. India is a price sensitive nation; moreover, we already have products which are tested, tried and price effective in the similar application segment, especially for base materials. There are also issues regarding fire retardant properties of this material. There are questions related to density of the product, content percentage of wood etc.

Also, Surfaces Reporter wants to draw the attention of current and coming up manufacturers about the case of Trex Company, a global industry leader in WPC Decking. Around 2008, Trex had to replace over 37000 decks in regards to some claims and quality issues. Finally, they had to change their 'maintenance free' claims with 'Low maintenance'. It is good to be excited about new materials and products; however, every step should be taken with care and every action with responsibility.

In the coming issues, you will see us covering these aspects deeper along with views from the actual users and architects. Surfaces Reporter is a magazine dedicated to information and analysis about materials & products. We believe in learning, informing and growing. Do guide us if we missed anything significant and send us more details. Know that we are big fans of readers who write their reviews about our articles and we appreciate both criticism and information. Contact us at PRESS@SURFACES.IN



Surfaces Reporter's MATERIAL METER - Wood Plastic Composite

(+) Pros

(-) Needs improvement

Looks like wood so people preliminary acceptance is high.

There is no way how a common buyer can differentiate, check or compare **Quality of two WPC products**.

Resistant to rot, decay & borer attack.

Price is on a very higher side.

Easy to work with conventional woodworking tools.

Some issue regarding **fire retardant** properties.

Can be bent to form strong curves.

Questions related to **density** of the product, content of wood etc.

Available in colours so painting or lamination is not necessary.

No testing parameters are set.

Can be **recycled**.

A booming market has encourages 'XYZ' to enter market causing **drop in quality**.

100% **Termite proof**.

Strong need of big and good players to enter the market who do not compromise with quality & awareness.

Saves surface coating cost, time and labour when used in its original form.

95% consumers still use the **tradition Ply products**.

More **versatile application** than its competitors because of its moisture resistant properties.

Lack of proper promotion & technical understanding.

Local carpenter needs training about PVC solvent and easiest joinery system, also about screwing, fixing and assembling mechanisms.