

WOODNEWS

NOV - DEC 2022

Vol. 32 • No. 4



32
YEARS

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industry

OLD WOOD, FRESH PURPOSE

Bengaluru-based Woodlabs
re-purposes used wood for
its heirloom furniture

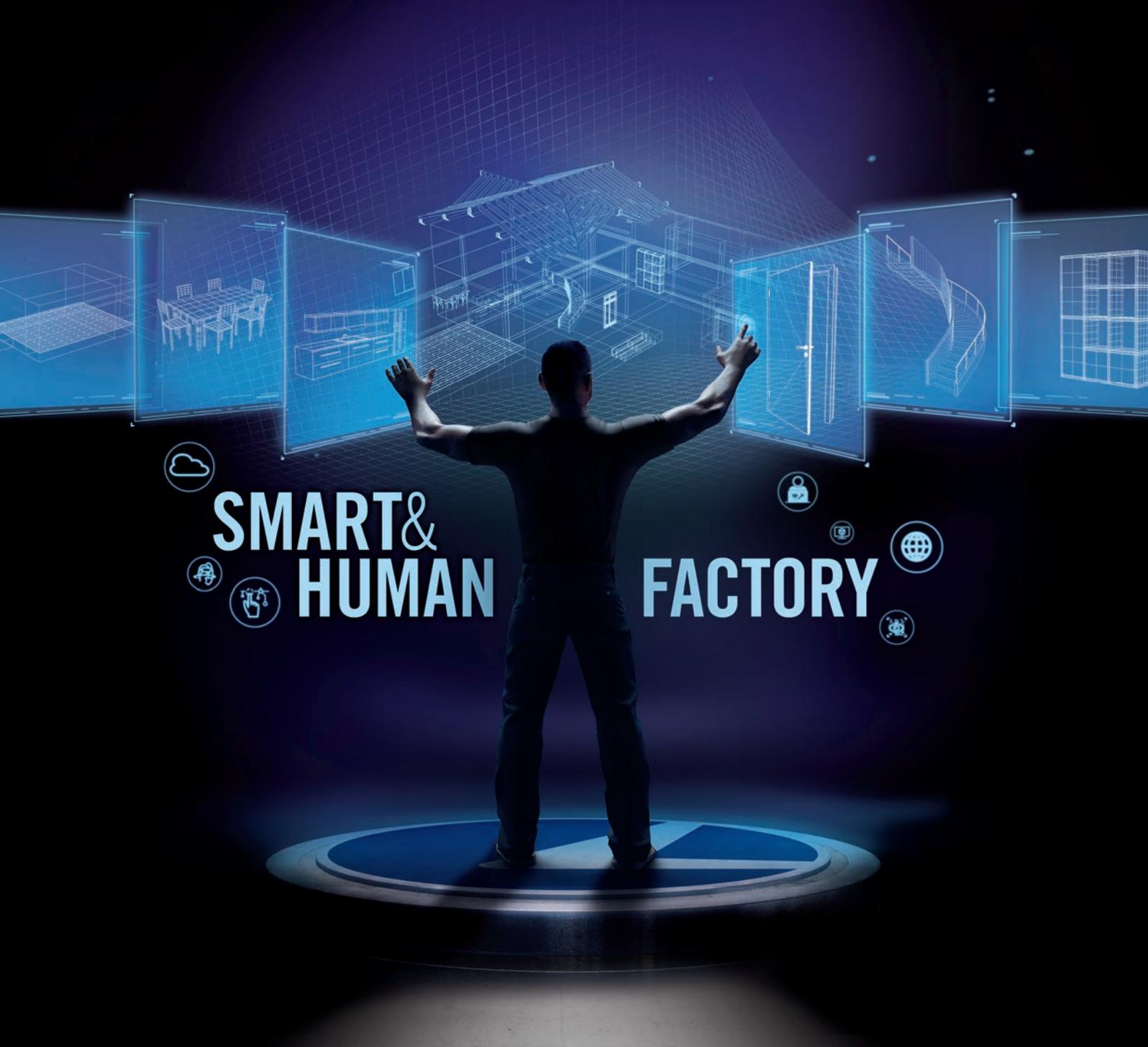
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Modular kitchens:
What's new and trending? P.48



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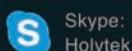
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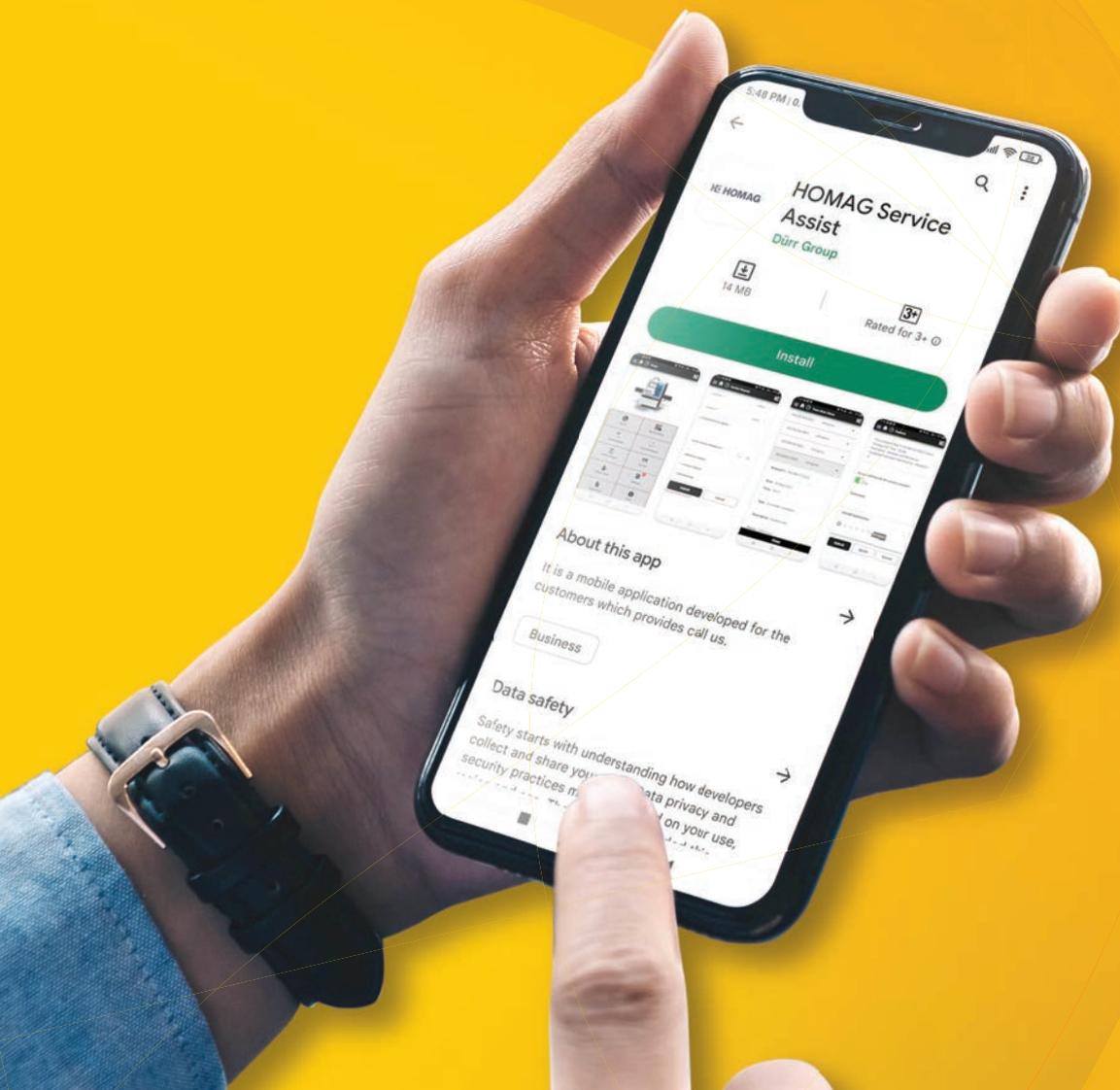
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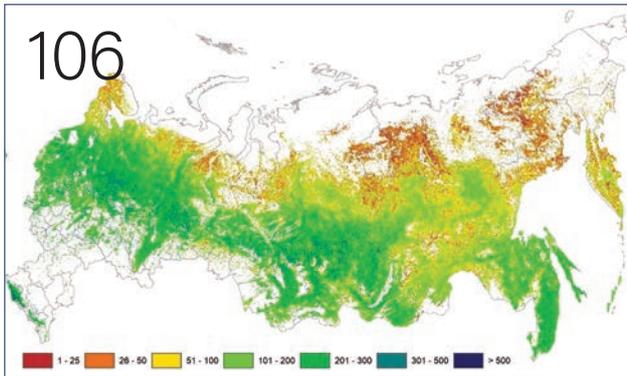
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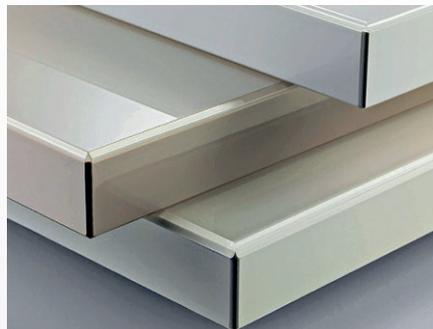
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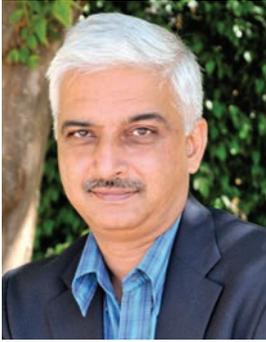
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EDITOR

DHANANJAY SARDEHPANDE

Back to basics: used wood, kitchen buzz and handshakes

Dear Reader,

More than 4 years after the last Xylexpo in 2018, the focus was back on Italian wood-based furniture technology, machinery, consumables and design, at the FieraMilano-Rho show in October this year. Understandably, some quarters of the machinery and materials suppliers in Italy were apprehensive on account of the long absence of their premier trade show. The severe social and business restrictions forced on them by the Covid-19 pandemic – along with global supply chain disruptions – have left many wondering how the business environment might shape up. To my perception, the resumption of Xylexpo has slowly but surely brought back the confidence that it would be business as usual in no time.

Apart from details of Xylexpo 2022, we also have some write-ups from events organised by

others suppliers, and have a calendar of future events for your reference.

But many goalposts have changed in the furniture manufacturing sector since early 2020. The long-drawn lockdowns in many parts of China continue to be a cause for concern for the furniture business worldwide. The on-going military strife between Russia and Ukraine is also a cause for alarm because of disruption of raw material (timber) flow for much of the European woodworking industry – not to mention looming shortage of fuel that is staring manufacturing and civilian life in most parts of the continent.

Caught between the devil and the deep sea (metaphorically), several woodworking technology, materials and components suppliers are looking to the developing economies that have displayed resilience – among them India – and are emerging as new, lucrative and stable markets. India represents not only a large consumer market for furniture and furnishings, but a potential manufacturing and export hub too.

In this issue, we have two interesting stories from Bengaluru. The cover story is about an architect-designer duo that finds their passion in tradition – the arts and crafts – without losing sight of the future. Read on to find out how Woodlabs re-purposes old teak to make heirloom furniture. Meanwhile, scientists at the Institute of Wood Science and Technology have developed and tested methods to manufacture transparent wood, which is being projected as a new sustainable material in construction.

Our Special Focus dwells on how modular kitchens are figuring in the growth story; the latest trends and developments in the kitchen space, and the wherewithal to make faultless and memorable kitchens. In our on-going educational series, an expert decodes melamine-based and other resins used in the making of high-pressure laminates.

As we near the end of 2022, the year of revival, we look forward to the year of progress in 2023. Happy New Year from Team *WoodNews!*

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Milan show shines spotlight back on Italy



Resuming after a 4-year gap, Xylexpo 2022 recorded more than 16,000 visitors in Milan.

The 27th edition of Xylexpo, the biennial international exhibition of technology for the wood and furniture industry, closed after four busy days in Halls 22 and 24 of FieraMilano-Rho.

According to the organiser, satisfaction was tangible from the very start, supported by the desire to restore personal meetings and handshakes, which ultimately translated into positive figures for the exhibition.

Satisfaction was also supported by the fact that Xylexpo 2022 was probably the only post-pandemic exhibition that has achieved a number of unique visitors, in line with the last pre-Covid-19 event in 2018.

The share of international visitors decreased, from 28% in 2018 to 25% in 2022. But this was in line with the expectations of the organisers, due to the closure of

markets like China, Russia and Ukraine, traditionally more interested in Italian woodworking technology.

Xylexpo 2022 was held alongside Viscom Italia, a digital communication show, and 33.Bimu, the exhibition organised by the Italian machine tools, robots and automation systems manufacturers' association. According to the organiser, Xylexpo 2022 alone recorded more than 16,000 unique visitors.

According to Luigi De Vito, President of the exhibition and of Acimall, the figures have confirmed not only the role of Xylexpo, but also the re-designing of the layout. "The focus this time was on the elements that will be the pillars of future exhibitions: a different strategy in product presentation and a strong focus on new

Winners of the XIA-Xylexpo Innovation Awards in solid wood, panels, finishing, digitalisation and sustainability categories.



digital services that can only expand the scope and function of this exhibition,” he said.

Xylexpo 'Oscars'

The XIA-Xylexpo Innovation Awards, a traditional event, were judged and rated in five categories: solid wood, panels, finishing, digitalisation and sustainability. The winners were awarded the Xylexpo "Oscar", a dwarf designed in 2014 by Elio Fiorucci for Riva 1920.

The award for the 'Solid Wood Processing' category went to Paoletti Energy for its gluing system, Iglueing PUR Hyper. It was found to be an innovative system for the application of polyurethane adhesives in finger jointing, with massive reduction of applicator cleaning time, more efficient use of adhesive, and easy integration with several machines.

In the 'Panel Processing' category, the jury decided to reward two solutions: 'Hand Guard' by Altendorf in Minden (Germany) and 'Blade Off' by SCM in Rimini. The innovations revolved around a significant improvement of operator safety in machines, "potentially applicable also to other types of machines", the jury opined.

In the 'Finishing' category, the automatic spraying machine, Excellent Cm80 by Makor was declared the winner. Its innovative features include enhanced belt conveyor cleaning, greater efficiency in paint use, and more effective overspray recovery.

The 'Digitalisation' award went to the 'Digital Factory' system of the SCM Group. This eco-system helps capture information and data from a production environment and up to after-sales, the jury stated. "It enables the OEM to leverage new business models in line with the current market trends."

The award for the 'Sustainability' category went to the wood dust extractor by Spänex (Germany). Energy saving, environmental protection and the integration with existing recycling systems were recognised as environmental benefits.



Some of the many Indian visitors to the Milan trade fair gather for a chat at the SCM Group's stall.



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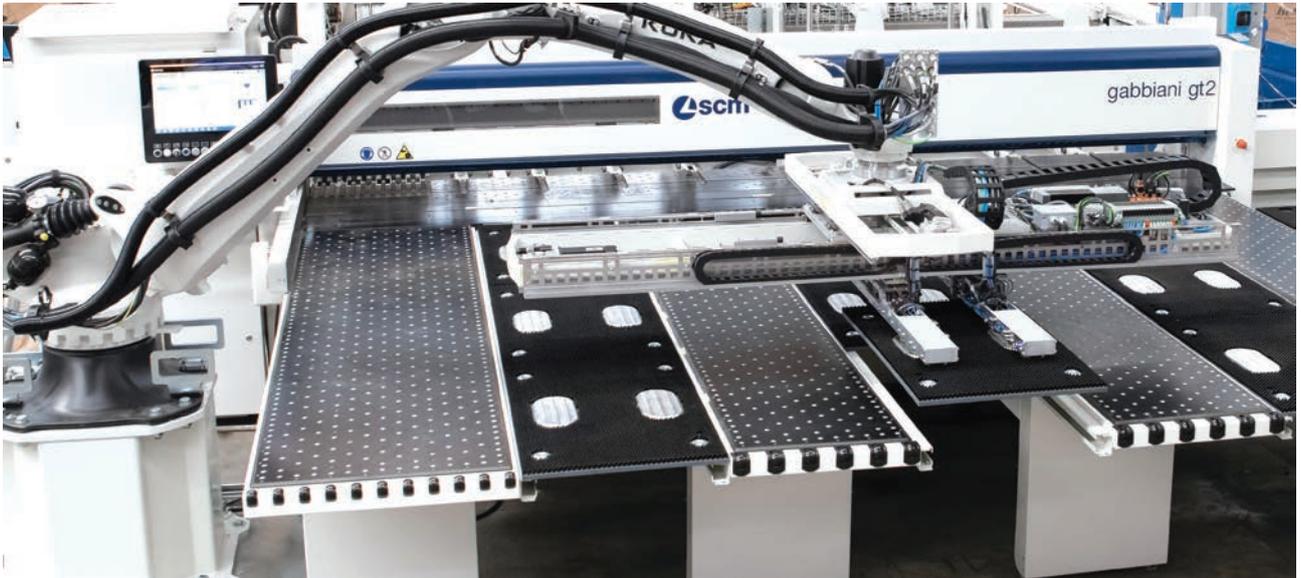


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SCM unveils a clutch of new solutions



The SCM Group was, once again, a key player at Xylexpo 2022. The occasion was special for the Italian supplier of a wide range of woodworking solutions – it is celebrating 70 years of innovation and success this year!

At its innovative and multimedia stand of over 2,000 square metres, SCM recorded a large turnout of professionals, experts and schools specialising in woodworking, as well as great opportunities in terms of orders,

negotiations and contacts.

Its award-winning Digital Factory model was the cynosure of all eyes: a digital, connected and integrated production process that supports customers with the most complex challenges of mass customisation, keeping down costs, consumption and waste, and simplifying management.

A system of 'Smart and Human Factory', it has flexible, automated and modular cells in two distinct versions for industry and joinery. This revolves around data preparation, planning, production,

SCM launched the Gabbiani GT2 beam saw with a robot during the show.

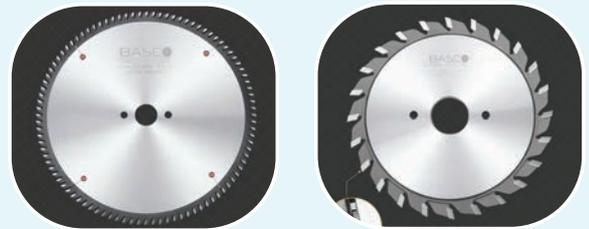
monitoring and after-sales assistance – and by increasing efficiency and connecting the office and factory. ▶

SCM Group shareholders (L) celebrate the 70th anniversary of the company in the presence of Luigi De Vito, SCM's Wood Division Director and General Manager.



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Going digital

There was also a rich offering of software and other digital services on display. Notable among them were the updated CAD/CAM office programming software for the preparation of data for Maestro CNC machining centres, the 3D Maestro Pro-View simulator for machining panels and solid wood, as well as the Maestro Beam&Wall for timber construction.

For planning, optimisation and production control, the new MES Maestro easyFlow is the Plug&Play solution integrated with all of SCM's software and machines, combined with both 'Smart and Human Factory' and Industry-4.0 interconnection of the entire production flow.

Among the new entries was the Maestro Optiwise for the Gabbiani single-blade and angular beam saws. It ensures the best out of cuts with a minimum amount of waste for both large and small production batches.

The mobile app, SCM Thundercut, is the only one that provides the operator with a step-by-step guide to inserting the panel into

the machine and making the cut, for a completely safe job even when done by those that are not experts.

The Maestro Power TMS software made its debut. It simplifies and optimises the management of tools inside the solid wood CNC machining centres' warehouses. It maximises the capacity of the warehouses and speedup the tool change according to the production mix. With more than a 100 tools readily available, it offers considerable reduction in time and an increase in productivity.

The digital services enabled by the IoT Maestro Connect platform have been further enhanced. The aim is to guarantee maximum return on the machines and plants in conjunction with the constant support from SCM technicians. This platform integrates into the 'Woodworking made Izy' project led by the most important European machinery manufacturers.

New solutions

In the edge banding area, SCM offered a new model of Stefani Cell-E which combines the numerous advantages of the Stefani X industrial edge bander in terms of productivity and machining quality, with the new Fastback 27 automatic panel return system.

A completely new entry was the Morbidelli CX220 drilling and dowelling flexible cell which creates all the parts of the piece of furniture more efficiently, even with pieces that differ dramatically from one another.

The new cell produces a panel per minute and in excess of 400 panels per shift with a single operator, with a footprint of only 50 square metres. Its layout allows for two possible uses: with an integrated robot on the rear side for loading and unloading operations, and with partial supervision of the operator.

There were three machines for a perfect and "orchestrated" work that dramatically reduce times and margins of error: the Invincible SI-X circular saw enhanced by the SCM Thundercut cutting optimiser-sequencer; the Startech CNC drilling centre to produce furniture parts without repositioning the tools; and the top performing ME 40TR edge bander with a new rounding unit.

SCM's new digital services and remote technical assistance (L) were the focus at the 2,000-square-metre stand during the show.



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Giardina betters itself in sanding, coating



The Giardina Group returned to Xylexpo 2022 with a clear desire to show off its Destefani, one of the best-known Italian brands in edge and profile sanding, and the Italian machinery supplier's partnership with Pininfarina in the form of the Dualtech Forma automatic spraying machine.

The iconic Dualtech Forma profile spraying machine has been completely redesigned. In the spotlight is the brand new 'Flexi Roll', which combines the search for the highest coating quality with the increasingly urgent need to optimise costs and reduce harmful emissions into the atmosphere.

This technology – available in various configurations – achieves

significant results in the treatment of not only flat, but also three-dimensional surfaces. The new production process can be integrated into Giardina's already wide range of roller coaters and with drying technology.

The Destefani MVT 4000 single-side edge sanding machine is a particularly effective configuration that makes it perfect for sanding the edges of MDF panels, chipboard and coated elements.

It is not far behind will be the MVS 2500, the smallest profile sander in the MVS range, an authentic masterpiece by Destefani, designed and manufactured for sanding frames, poles, strips, elements of door and window frames, veneers, solid wood elements and unfinished or treated MDF parts.

According to Stefano and Riccardo Mauri, owners of Giardina Group, the profile

The iconic Dualtech Forma profile spraying machine has been completely redesigned with the new 'Flexi Roll' to optimise costs and reduce harmful emissions.

brushing/sanding machine is equipped to be particularly effective in machining wooden floor elements, guaranteeing excellent levels of finish not only on the sides, but also on the top surface of the element, creating three-dimensional effects.

The Giardina Group designs, develops and manufactures systems for roller, film, spray and vacuum coating; automated and robotic lines with hot air, UV or microwave drying systems; overhead lines to coat windows and doors or three-dimensional pieces; spray booths and special systems; edge and profile sanding solutions.

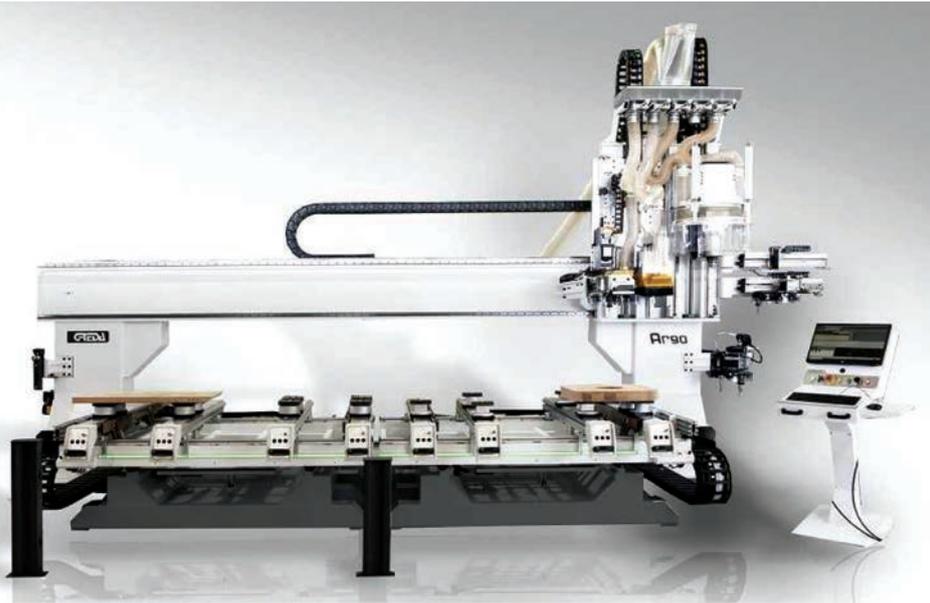
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Greda bets on its NC machines



The comeback of Greda at Xylexpo 2022 lined up with the exhibition of some of its latest technologies with three NC-machining centers: Argo G-Max, Mitika V5 and Poker V5.

Argo G-Max, an excellent solution for solid wood, panels, composite materials and curved components working, made its official debut in Milan and caught the attention of those who look for flexibility, precision and high working speeds

combined in a single product.

This NC-machining center has functional accessories, rigorously designed to improve the production process, optimise the set-up and support the technical staff – for example, visual positioning through led guidelines, pneumatic systems to help loading, and an innovative analysis, simulation and control software able to preview simultaneously programme's execution.

Beside Argo G-Max, two solutions for turning, routing and carving in 5-axis, both for realization of unique details of premium precision and quality, and for batch production, thanks to automatic loading and unloading systems

The peculiarity of Poker V5 and Mitika V5 is the possibility of using the shaping and sanding units simultaneously which, together with tool-changing at the masked time, ensures a great reduction in processing time and high productivity.





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Maggi adds to CNC boring line-up



Boring System 1200-Evo

Maggi Technology has designed and manufactured woodworking machines in Italy since 1963. It works to ensure that artisans and small-scale furniture manufacturers can rely on its simple, efficient, durable solutions, with an investment geared to their needs.

Additionally, Maggi's easily programmable automatic boring machines are designed for those who wish to speed up custom manufacturing by organising the process.

At Xylexpo 2022, Maggi presented two new CNC automatic boring machines, designed specifically for those who have never worked with a computer numerical control machine, but want to make a leap in product quality.

The **Boring System 1200 Evo** is the ideal solution for small furniture manufacturers of kitchens and bespoke pieces of furniture with high accuracy, versatility and productivity.

It has a user-friendly software interface; small footprint of 3 square metres; is easy to maintain; has automatic lubrication of the axes; low power consumption; and can be configured to customer's requirements.

The software interface is intuitive and icon-based; can directly import 3D-CAD file formats such as .stl, .stp, .iges, .obj, .skp and 2D files in .dxf format; and abides by all requirements for 'Industry 4.0' standards.

It can take a maximum panel weight of 70 kg to process heavy kitchen tops and out-of-standard working pieces.

The **Boring System 21 Technology** is a multi-spindle, single-head, electronic boring machine with 3 NC axes, for horizontal and vertical drilling into wood-based panels and solid wood.

Thanks to the touch- and icon-based patented system, for the electronic selection of boring height, depth and boring angle over a PLC, the set-up is easy and intuitive and does not require

any specific programming skills.

The high-precision movement of the NC axes, driven by stepper motors and end-coder – as well as the well-balanced and even movement of the boring head, driven by a centred motor and linear sliding guides and ball bearings – ensure an extremely accurate drilling process, and high-quality end products.

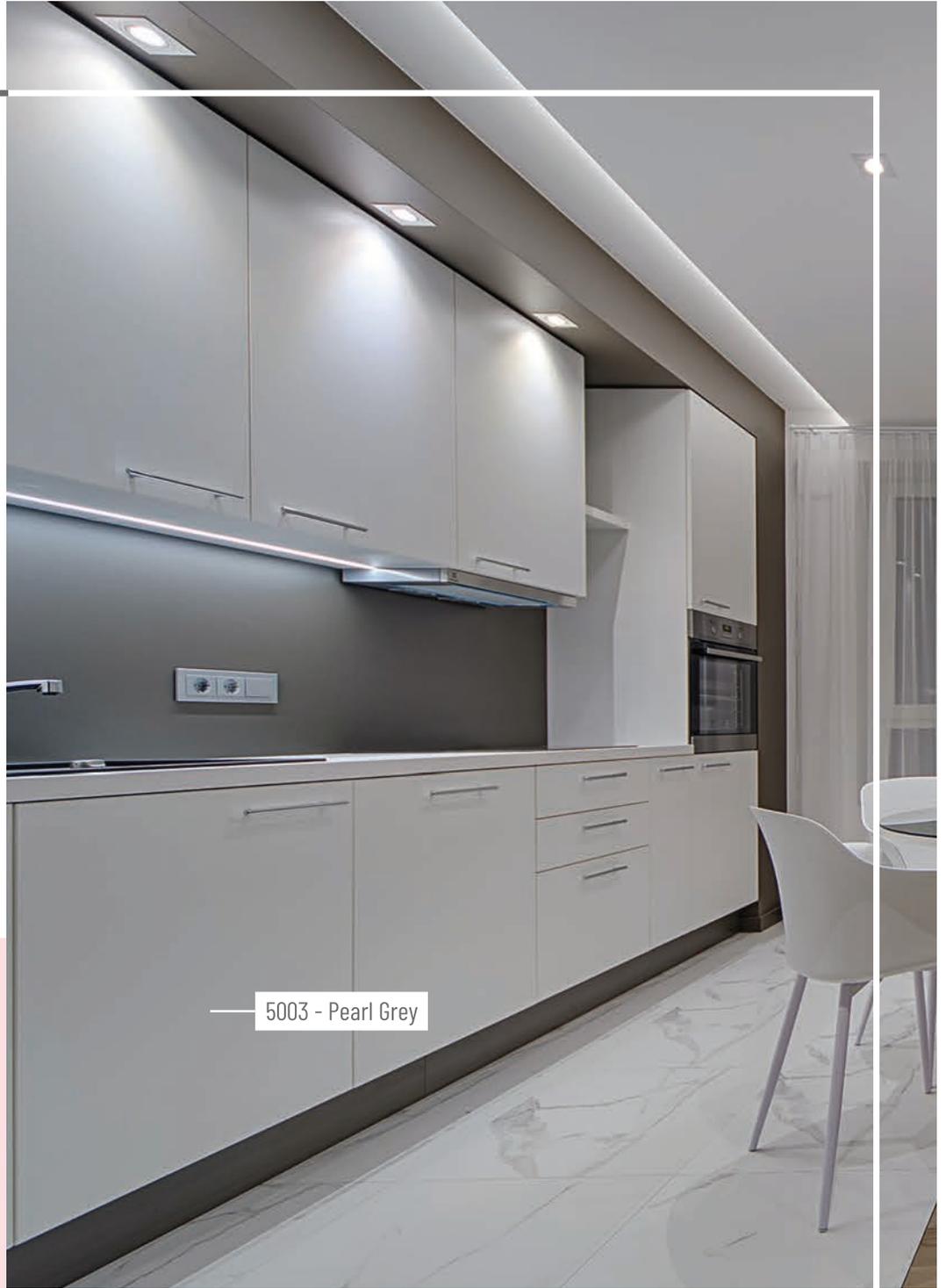
The reference side fences, adjustable on numeric counters, always represent a precise reference point, quick to set-up, and guarantee perfect parallelism of the drilling operations.

In addition, Maggi Technology is already in the India market with two machines for small furniture manufacturers. The semi-automatic, multi-spindle, single-head boring machine, **Boring System 21 Prestige**, is employed for horizontal and vertical drilling into wood-based panels and solid wood. ▶



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Boring-System-21-Technology

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Maggi Technology is represented in India by Bengaluru-based Jovas Tech Solutions. For more information, write to support@jovastech.com.



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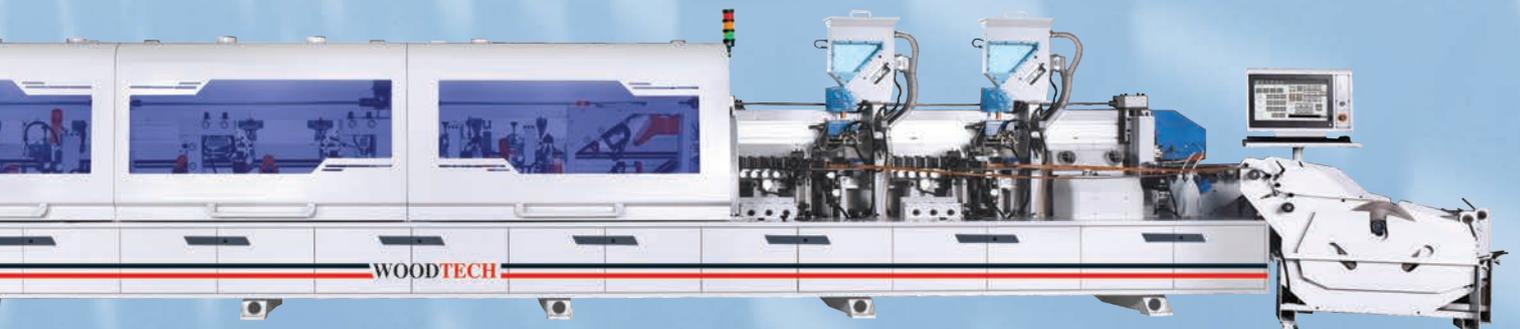
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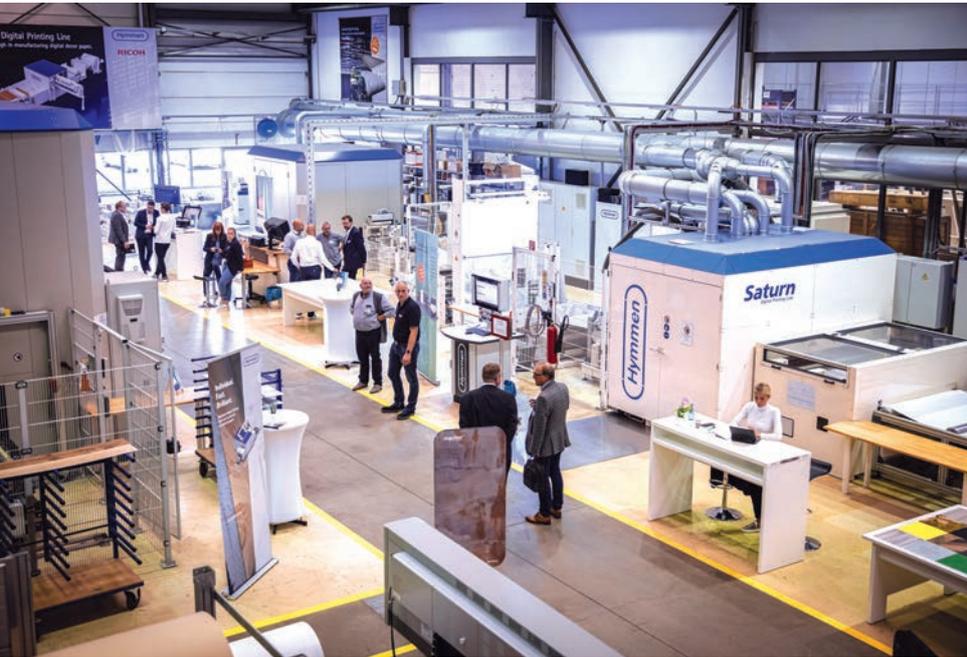
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Hymmen hosts Tech-Together show



Hymmen, a renowned supplier of compact press boards, inkjet printers and doors for the furniture and interiors industry, recently held the 2nd edition of its Tech-Together in-house exhibition event.

Attendees at the Hymmen Technical Center in Rödninghausen (Germany) were shown new and proven products from digital printing technology to press and coating systems and the industry intelligence solution Smart2i.

Visitors also took part in exciting live demonstrations of the digital lacquer embossing (DLE) line, the production systems for digital decor printing on board material with UV-curing inks (Jupiter), and water-based digital printing of decor paper (Saturn).

The HPL double-belt press was waiting to press digitally printed paper into laminate on site.

Hymmen's coating finishing technology, calender coating inert (CCI), was shown to produce outstanding quality mirror high gloss as well as super matt surfaces, which were also on display.

The latest innovation presented was equally relevant for all Hymmen-owned, as well as external machines and systems. The Smart2i industry intelligence for cloud-based monitoring and analysis of

all relevant process parameters is the solution to optimise the entire production.

The live application of Smart2i was experienced in real time by monitoring and analysing the current production data of the technology in operation at the fair. The practical presentations were accompanied by talks on artificial intelligence.

Among the companies that participated in the event were Düspohl Maschinenbau GmbH, Heinrich Kuper GmbH, Hesse GmbH, Koch Technology GmbH, Lehbrink Special Machines GmbH, MB Mechanical Engineering GmbH, Venjakob Mechanical Engineering and Wehrmann Woodworking Machines GmbH.

The event format provided a combination of in-house exhibition and virtual content. The content was designed individually and was the responsibility of the individual participants.

The Ostwestfalen-Lippe (OWL) region continues to offer concentrated machine, plant and supplier competence in the woodworking sector. Since 2012, it has been Germany's leading edge technology cluster for intelligent technical systems.



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 **BIESSE**

Jowat focuses on path to circular economy



The 19th Jowat Symposium, held in Detmold (Germany) in early November, provided comprehensive expertise for guests from the wood and furniture industry from across Europe.

This year the established trade event focused on the future viability and sustainability of the woodworking industry. Which strategies safeguard the success of an enterprise in turbulent times? How do closed loops influence and promote sustainable development in the wood and furniture industry?

To discuss these questions, more than 120 participants convened at Jowat's headquarters of the adhesive manufacturer's House of Technology.

The symposium featured a series of presentations to shed light on

the most different aspects of sustainability: the impact of changing raw material markets, and disturbed supply chains on the risk management of an enterprise.

Strategies for building an efficient circular economy – particularly in the chemical industry –, the potential of bio-based raw materials, and possible paths towards more sustainable adhesive bonding processes were also discussed.

The presentations were followed by a panel discussion, in which experts from the sub-supplier industries, external industry advisors, and representatives of wood-based material, waste disposal and recycling associations discussed the importance of a functioning circular economy for sustainable industrial processes.

Dr. Christian Terfloth, Managing Director of Jowat SE, emphasised that circular flows are the cornerstone of sustainable management and can only be established

if there is an open exchange between all players along the process chain.

The conference was rounded off with many ideas coming from processor experiences and with new solutions from the Jowat adhesive portfolio. In addition to the presentation of the latest news from machine manufacturers and research and development, the trade foyer also provided an opportunity for an open exchange with other participants.

Jowat SE is one of the world's leading suppliers of industrial adhesives. These are mainly used in woodworking and furniture manufacture, in the paper and packaging industry, for graphic arts, in the textile, automotive as well as in the electrical industry.

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FENAFOR 2022

10-12 November

Venue: Centro de Convenciones Jockey Plaza, Lima (Peru)

Fenafor is the international fair of machinery, supplies, accessories and services for the forestry, wood and furniture industry, with the active participation of national and foreign exhibitors, disseminating new technologies, latest trends, providing training and presenting innovative solutions. It is the only specialised event for the forestry, wood and furniture sector in Peru that will allow entrepreneurs to stay up-to-date and in direct contact with new or potential suppliers in the sector.

www.fenafor.com

WORLD FURNITURE EXPO 2022

17-19 November

Venue: Nesco, Bombay Exhibition Center, Mumbai

World Furniture Expo is a strategic, dedicated expo specialising in all categories of the furniture and décor industry. It is fashioned as the definitive international sourcing marketplace to connect with leading builders, architects, dealers, distributors, importers, retailers, e-retailers and other buyer groups. It is showcasing quality suppliers from India, Bangladesh, Singapore, Thailand, Malaysia, Indonesia, Vietnam, China and Turkey.

www.wofxworldexpo.com

WOODTECH AFRICA 2022

1-3 December

Venue: KICC, Nairobi, Kenya

Woodtech Africa is one of the finest trade shows for woodworking machinery, furniture hardware and fittings, power tools, adhesives, plywood and panels, laminates, flooring, wood composites, particle boards, raw materials, coatings, veneers, timber and lumber, doors and windows, and more products. For exhibitors, the show offers an important platform to target furniture manufacturers, architects, builders, interior decorators, saw millers, timber merchants, wood makers, carpenters, hardware, dealers and distributors manufacturers, craftsmen, and forests officials on the African continent.

www.woodtechafrika.com



CAIRO WOODSHOW 2022

15-18 December

Venue: International Convention & Exhibition Centre, Cairo (Egypt)

The event will provide opportunities for business professionals to not only meet industry experts, but to also learn about the latest trends, technologies and products. The show plays a fundamental role in further developing the market of wood and wood machinery industry in the heart of the capital of the North African commodities market.

www.cairowoodshow.com

NORTH-EAST WOOD EXPO 2022

16-18 December

Venue: Maniram Dewan Trade Centre, Guwahati, Assam

India's most ambitious business event for the wood and furniture manufacturing sector is North-East Wood Expo 2022, offering the industry an opportunity to expand its presence in the emerging destination for furniture manufacturing and woodworking in India. This will also enable them to present their offerings to entrepreneurs, innovators, architects, builders, developers, government representatives, consultants, contractors, lighting consultants, town planners, corporate, research and academic institutions, multilateral development institutions and all other stakeholders at this single exposition.

<https://northeastwoodexpo.com>

AFRIWOOD ETHIOPIA 2023

19-21 January

Venue: The Millennium Hall, Addis Ababa, Ethiopia

Afriwood 2023 is the foremost exhibition that offers you a chance to meet woodworking professionals and develop ideas for increasing the range and quality of one's business. It has a vision to be the platform for creative ideas and new technologies, as wood manufacturers and traders turn their attention towards innovative resources that would boost business.

www.expogr.com/ethiopia/afriwood

NEPAL WOOD INTERNATIONAL EXPO 2023

27-29 January

Venue: Bhrikuti Mandap, Kathmandu, Nepal

The expo is Nepal's largest and the most successful exhibition and trade fair on woodworking machinery, tools, fittings, accessories, raw materials and products. Exhibitors can showcase their potential by providing detailed demonstrations of latest products and services, within industry segmented pavilions.

<http://nepalwood.com.np>

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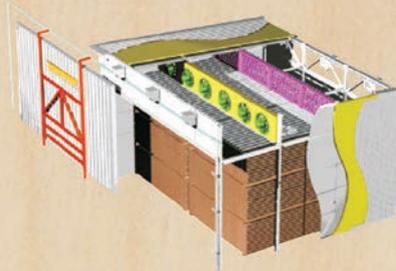
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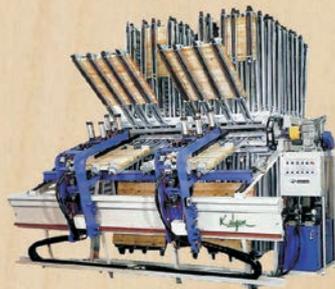
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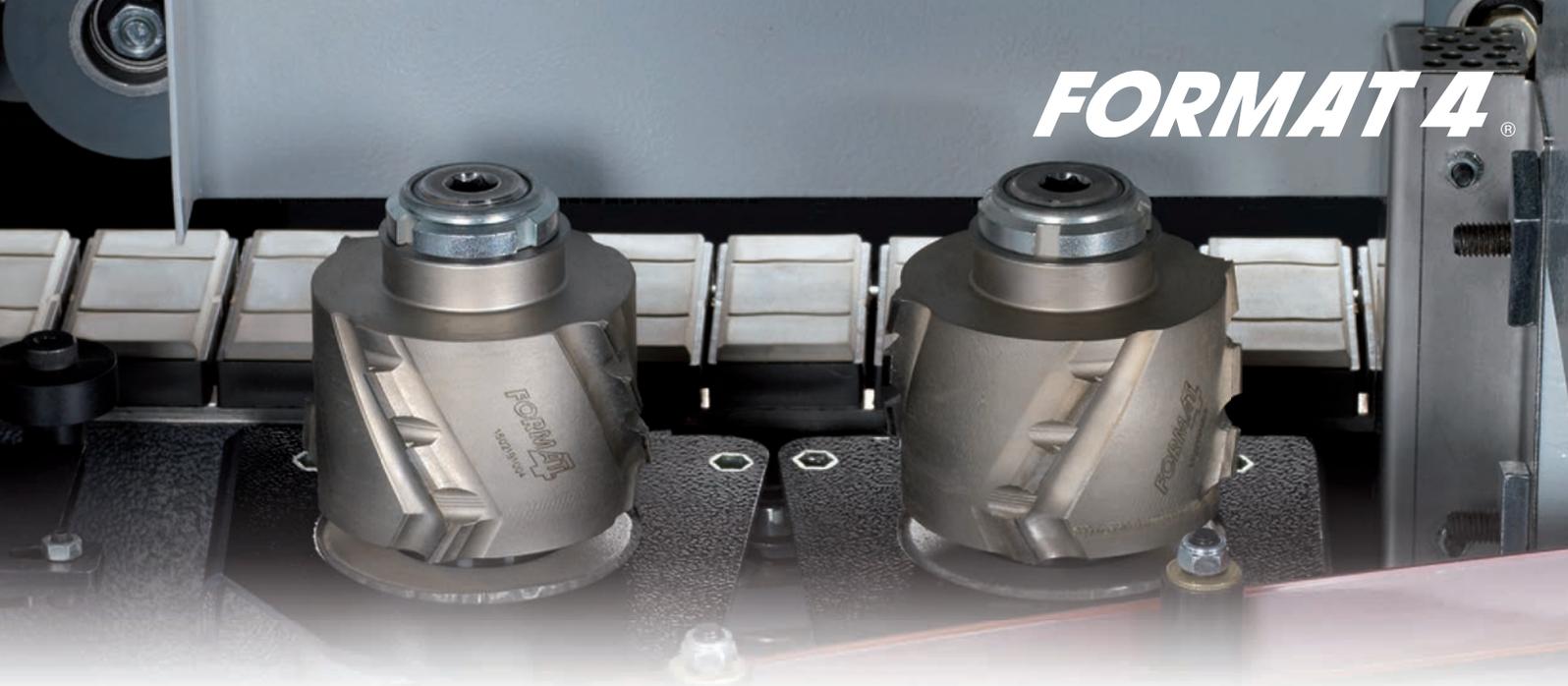
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Old wood, fresh purpose

The co-founders of Bengaluru-based Woodlabs, Abhirup Dutta and Deeptashree Saha, are plugged into the past, re-purposing used wood to make heirloom furniture. And yes, they retain a clear vision for the future.

KHUSHI RAWAT & ROY THOMAS

The popular perception about startups is that budding entrepreneurs have their 'Eureka!' moment before they go about incubating an idea. But for Abhirup Dutta and Deeptashree Saha, co-founders of Woodlabs, a workshop for hand-crafted wooden furniture in Bengaluru, the idea of re-purposing old wood and getting to design entire home spaces with it came about gradually.

For them, several years of interactions, experiences and observations eventually coalesced into a workable business model. And when the business is something you are really passionate about, then even the stars align to make it a reality!

Abhirup, a Bengaluru-based architect, had always been interested in old furniture and designs, but felt a disconnect between the demand and supply of good and reliable timber, and hence the

difficulty in sourcing it.

His stint with the award-winning and globally recognised firm, Studio Mumbai (run by Bijoy Jain) was an eye-opener for Abhirup. Bijoy had developed a body of work that continues to reference aspects of both Indian and Western cultures. "What sets that studio apart is the brilliant combination of tradition and modernity," Abhirup says. "Local resources and Indian craftsmanship form the basis for its highly contemporary architectural designs."

Thoughtful and uncompromising to the last detail, the architecture of Studio

Two examples of contemporary furniture designs from Woodlabs: the Sita Vishram Asandi (L) and Vakra Vishram Asandi, both lounging chairs.





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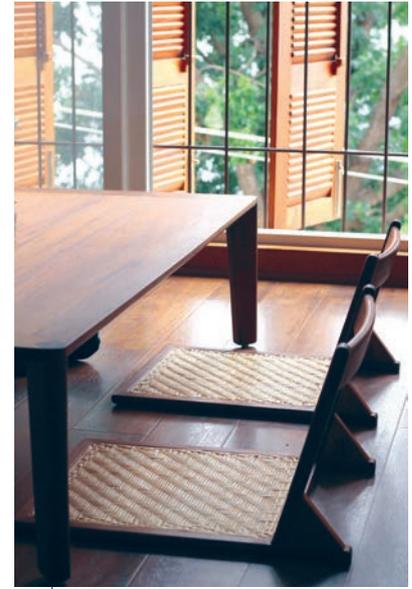
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Mumbai showed Abhirup the deep concern for the relationship between man and nature. He now insists on the importance of the *genius loci*, the protective spirit of a place.

It was while working here that Abhirup came across carpenters from Bagawas, a village in Rajasthan, who were exceptional artisans and craftsmen. "These artisans embody the old-world concept of carpentry, which seemed to be dying in the face of modern, mechanised, mass manufacturing," Abhirup notes.

Artisanal design

Abhirup and Deeptashree started Woodlabs in 2015. Deeptashree is a Kolkata-based interior designer whose background allowed her to hone her passion for spaces and sharpen her aesthetic as a

connoisseur of rural craft.

With a handful of motivated artisans from Rajasthan who joined Abhirup in the venture – and loads of enthusiasm to go with it! – the workshop started operating from a tiny garage in Bengaluru. Fast-forward to 2022: Woodlabs has moved to a new, modern location on the northern outskirts of the city.

There are no monstrous industrial sheds or factory-like structures here. Instead, neat, pre-fabricated modular structures abutting a lake greeted us during our visit to the workshop. Neatly marked-out extensions in the vicinity tell us that expansion is on the cards.

According to Abhirup, "Woodlabs is a one-concept wood workshop that gives life to ideas with expert craftsmanship and a motive to innovate, while also being a conscious step towards the slow life." With a hands-on, artisan-centric approach to design, the company strives to produce

Dining room options include the Vleen Sandhara with trestle legs (L) and the traditional low-level Bhu Asana (R).

heirloom pieces that can be passed down for generations.

Abhirup, with his training in architecture and product design, dedicates himself to experimental research through a deep investigation of materials and engineering. His experience with renowned architects has definitely helped him discover a love for wood that combines architecture and engineering.

Souls of trees

"Understanding wood is very important, and our woodworking story is very personal to the soul of the tree. The approach tries to highlight the subtle nuances in the grain and figure that gives us a small glimpse into the past of the lumber," Deeptashree tells us. ▶



Our woodworking story is very personal to the soul of the tree. We try to highlight the subtle nuances in the grain and give a small glimpse into the past of the lumber.

– Deeptashree Saha

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Woodlabs' furniture and products are made from solid wood. "Good quality wood is a scarce commodity; so it needs to be used consciously and judiciously. All pieces here are built keeping in mind the lost value of old teak, which is at least 80 years old," she adds.

The material is sourced and reclaimed from old buildings that are being demolished or renovated with the intention of giving them a second lease of life. Woodlabs stores an inventory of wood that lasts around three months before restocking it. Each piece of wood is labelled and documented as it is processed into new furniture.

Abhirup and Deeptashree believe in having a purist approach; that good quality wood should be appreciated in its natural form. As testimony Woodlabs completely

refrains from artificial staining or colouring of their pieces. It has developed a curated range of finishes which celebrates various lost techniques of wood finishing.

Cutting waste

With an emphasis on artisanal hand-crafting and wood joinery, interlocking joints are used to execute accurate joinery and to minimise the use of screws. The workshop is equipped with the basic machines and tools, which include an SCM Nova 15 Arbour saw, a Combi planar, a wood lathe, a band saw, a chop saw, a scroll saw, a sanding machine, a router and an assortment of miscellaneous hand tools from Makita.

A metal lathe is also available and, along with wood finishing, brass metal bolts for folding chairs (perhaps the only metal part used) are also fabricated in-house.

The design of the furniture is lean and sleek, in contrast to the bulky, carved-out works of traditional Indian wooden

furniture. Part of the reason this style is preferred is to keep the wastage of wood to a minimum.

Sustainability is the pivot around which Woodlabs functions and the idea governs every aspect of its working. The excess cut-out blocks of wood are not thrown away or burned, but are re-purposed differently.

Their lines of wooden toys (Musing Thing) and home products (Woodlabs Objects) make use of such pieces that are not suitable for making furniture.

They also collect live edge slabs of wood to create unique table tops and benches, to display the unique grains on each slab and create exclusive pieces of furniture. Inspired by Japanese and Scandinavian styles of furniture-making, the pieces produced are muted and modest, so as to blend in with the interiors.

Most of the products made are inspired by existing designs. "We re-designed a swing into a sofa and the sofa into a day

“



Sustainability is the pivot around which Woodlabs functions. The excess cut-out blocks of wood are re-purposed differently.

– Abhirup Datta

”



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Woodlabs' artisan-centric approach to design promotes traditions of Toshok (cotton bedding), Kantha (quilted embroidery), cane weaving and Madur (mat weaving with grass).

bed. The ideas are always evolving," Deeptashree says.

Oils & finishes

To stay true to its mission of not utilising any artificial materials in the making of its furniture, Woodlabs uses the ancient technique of hand-rubbing oil as the finish. This consists of polishing the wood with up to seven layers of linseed oil and insecticide.

Not only is oil water-proof and alcohol-resistant, but it gives wooden furniture an attractive natural sheen and texture. The penetrating and durable nature of oil finishing keeps the wood moisturised and enclosed in a breathable coating.

"Wood is a living element, even after being converted into a piece of furniture. It exchanges moisture, ages and reacts to the environment very similar to skin," says Deeptashree. "Our practice focuses on natural oil finishes that, over time, become a part of the furniture and develop a patina that lasts generations."

Another method of finishing used is *shou sugi ban*, a technique that originated in Japan in the 18th century, primarily as way to make cedar siding weather-proof. The

technique has caught on recently as a treatment for contemporary exteriors and indoor furnishings alike.

It involves charring cedar planks and then burnishing the burnt wood with wire brushes and sandpaper. It gives the wood a dark, almost black, look while still showcasing the natural grains.

The gravitas imparted by the process and finished result are undeniable: the blackening of the wood reveals clean, distinct lines and an inherent textural beauty. This process can also help make the surfaces last longer, because charred wood is fire-retardant as it lacks the oils needed to feed a flame.

Even the paint used at Woodlabs is hand-made, using the age-old process of 'Sudha Ranga'. This paint is made using milk, natural pigments and lime to stabilise it.

Different pigments react differently with subtle variations, making every piece unique. The colour is almost translucent, which allows the wood grains to show through. The wood that is painted using this method does not peel off and is highly resilient.

Business model

Abhirup and Deeptashree's determination to preserve the culture and craft of rural India is not limited to woodworking. They have other initiatives that promote the use of traditional Indian practices such as the making of Toshok (cotton bedding),

Kantha (quilted embroidery), rattan (cane) weaving, Madur (mat weaving with grass) and many such upcoming ideas. Woodlabs incorporates the products of these crafts into their furniture.

Woodlabs has completed projects in Kolkata and Chennai. A majority of their clientele is from South India; but they have done projects in North India too. Their clients are usually people whose principles align with the idea of slow construction and consumption, those who appreciate and value the process behind the creation of these bespoke pieces.

These clients have most likely already explored and experienced a majority of the other products available in the furniture market and have reached a conclusion to purchase furniture that can last their lifetime and longer.

Most of Woodlabs' projects extend to furnishing the entire house and customising furniture pieces according to the requirements of the client. It also has multiple lines of designs that they make on order.

Future plans

The co-founders trust their work to speak for their brand as their marketing is done primarily by word of mouth. They have only recently hitched onto Instagram to showcase their products and keep their buyers updated.



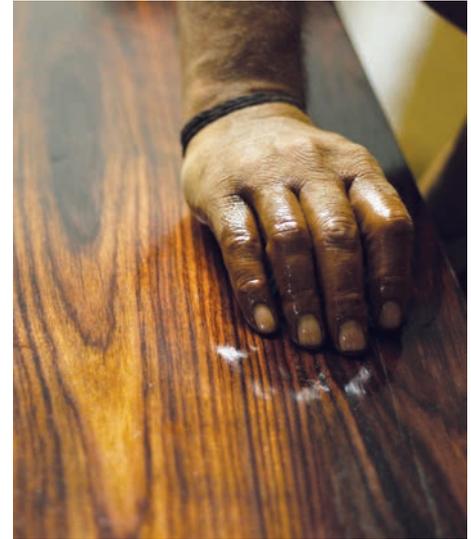
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The paint used at Woodlabs is hand-made (L), using milk, natural pigments and lime to stabilise it. Hand-applied oils and waxes (R) keep the wood moisturised and breathing.

Since the supply of good quality old teak is depleting, Abhirup and Deeptashree look forward to easing of timber import restrictions, so that they can work with more A-grade timber. They are prepared to work with fresh-sawn wood in the foreseeable future, but their hearts will always lie with using reclaimed wood to make their products.

Sometime in the future, when necessary space and infrastructure can be set up, Abhirup and Deeptashree would like to start workshops for design students who are interested in wood. For around 4-5 months, the student(s) will be tagged to an artisan, who will teach them the ropes. "It will be akin to a finishing school," the co-founders say.

It is definitely the road less trodden; but if there is anyone who could carry it off it is Abhirup and Deeptashree, who have the drive and passion to make things happen. Curious still about Woodlabs? Write to them at abhirup@woodlabs.in or deeptashree@woodlabs.in.



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Cooking up a growth story

A kitchen is the heart and soul of any home. From cooking delicacies to serving love, a kitchen has always been the epicenter for socialising and bonding in a family.

Even though the essence of it lives on, the picture of a traditional Indian kitchen seems to be fading away, with more women joining the workforce. The rising middle-class population, decreasing household size, growing demand for premiumisation, changing customer preference, and increasing spending power have indirectly led to the rise in the demand for modular kitchens.

What was once a privilege of the elite, has now become a common household requirement.

Kitchens are getting more attention with working couples moving towards more comfort, luxury and modern designs. The working class is not afraid to experiment, and this is fueling the industry towards newer avenues and world-class products.

Over the last few years, the kitchen market in India witnessed an inclination towards modern designs, efficiency and comfort. Many Indian and international players have tapped this emerging market and bring innovative concepts to add a splash of luxury to Indian kitchens.

A survey by one of India's leading home interior brands shows that Millennials are more than ready to spend, and they are doing it in style. According to the report, 92% of married couples chose



modular kitchens, with an average spend of Rs 3.14 lakh, says Homag India.

Almost 50% of this population was in the age group of 35-44 years, while 35% of the buyers were Millennials (ages 25-34 years). However, only 18% of those above the age of 45 were open to switching over from traditional to modular.

Current trends

There is an up stick in demand for online distribution channels predominantly from Tier-1 cities which are dominated by information technology hubs such as Bengaluru, Hyderabad, Chennai and Noida.

Frequent job-hopping by techies seeking better job opportunities, and hybrid working patterns, have forced them towards furniture on rent or online furniture shopping.

However, due to the lack of touch and feel concept and the need for customisation, the offline channel still holds the major market share in India.

Key reason why modular kitchens are gaining popularity among the Indian middle class is that service providers are offering a pre-defined price range and the timeline for execution.

Everything is made available online – from blueprints to 3D designs. Besides, complete end-to-end management by the service provider allows working couples to breathe easily and saves them

from all the running around.

A growing demand from Tier-2 and Tier-3 cities, an increasing number of residential construction projects, and a surging number of partnerships between real estate project developers and modular kitchen manufacturers would drive the market in the near future.

Competition landscape

The Indian modular kitchen segment is booming and holds immense potential. Research firms have predicted a 27% compounded annual growth rate till 2024 for the modular kitchen industry.

While many Indian companies have emerged in the last few years, foreign players also find it easy to carve their niche by partnering with smaller local firms, thus fostering a symbiotic relationship. Almost 30% of the overall market belongs to imported products in the segment, with Italy and Germany leading the way.

A select few of the Indian players are already enjoying the technological edge, by not only using innovative concepts to promote their products and services on the local terrain, but also managing and delivering projects till the last mile.

The main challenge is the high price range of branded modular kitchens forcing customers to opt for sub-standard, build-at-site, frugal solutions offered by local carpenters, affecting the market share of the organised segment.

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Two 'essentials' from Homag



Homag India is striving to enable modular kitchen manufacturers to offer world-class, customised modular kitchen solutions at a pre-defined price range to cost-conscious and demanding Indian customers.

Whether you need a long-lasting machine to improve returns on investment, self-diagnosis software for machines, digital solutions to manage production operations, reduce waste, generate customised quotations, user-friendly 3D design software for a semi-skilled workforce, training, or consultancy service, you get all solutions under one roof.

Indian woodworking companies can hugely benefit from comprehensive woodworking solutions offered by Homag India, to deliver projects to the last mile.

A must-have for any modular kitchen manufacturer is the DrillTeq V200, a three-axes, all-rounder vertical CNC processing machine; and SmartWOP software,

to design furniture quickly and intuitively using a drag-and-drop function, offered by Homag India.

A flexible all-rounder for processing, the DrillTeq V200 is a versatile machine that can be used for drilling, trimming and grooving, offering the ideal solution to save time, space, energy and money.

Whether you are a small carpenter, a mid-size trader, or a large modular kitchen production company, this one machine can meet all your custom needs. PowerTouch operating concept, vacuum-

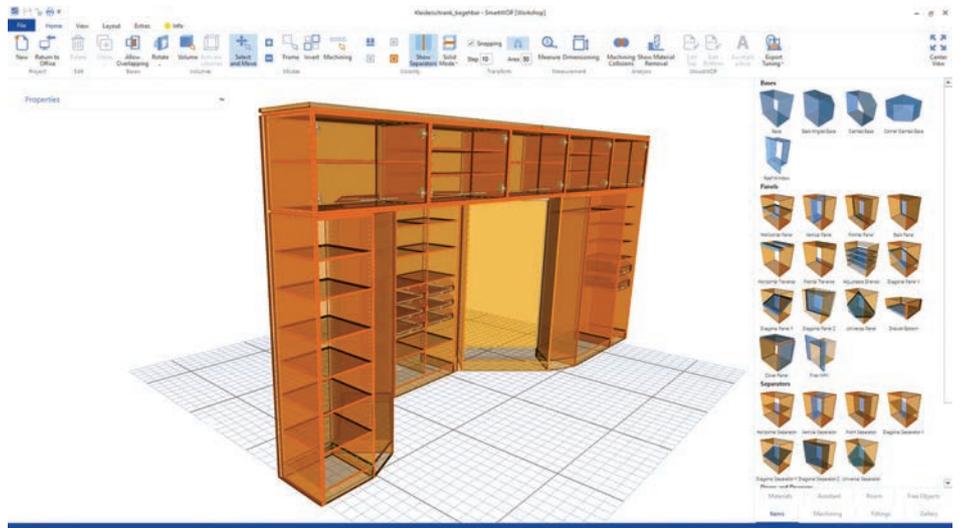
free clamping system, up to 13 vertical high-speed drill spindles, quick drill change system, and automatic tool change magazine are some of the key features of this machine.

Many customers want furniture design software that offers maximum flexibility & easy to use. SmartWOP is a CAD/CAM system that helps to build custom furniture simply using drag-and-drop, or even with a touchscreen device.

SmartWOP helps semi-skilled machine operators create custom-made furniture without any CAD knowledge. This greatly reduces the turnaround time and the need for technical training and skilled manpower.

Kitchens are gaining recognition in the home improvement category to augment both their functionality and decor. Restructuring and remodeling the kitchen to a more attractive one has become a trend in India.

Homag India is the ideal partner for woodworking companies who are determined to compete with international players and establish themselves as a household name by providing state-of-the-art, best-in-class, end-to-end modular kitchen solutions to their customers.



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Venjakob customises finishing line for Nolte Küchen

For popular German brand, Nolte Küchen, Venjakob designed and installed a system to be able to run economically in small batches and allow for up to 20 colour changes.

For 60 years, Nolte Küchen, one of Germany's most popular kitchen brands, has been producing high-quality fitted kitchens that focus on people. For most users, a good price-to-performance ratio and design are among the decisive criteria for investing in branded kitchens.

The need for individuality is increasing and style-conscious, design-oriented consumers want an ever-greater selection of colours and combinations. In order to meet these criteria in the future, the kitchen manufacturer is continuously investing in the latest state-of-the-art technology.

Nolte Küchen tied up with Venjakob, acknowledged globally as the mechanical engineering specialist for surface processing, for a spray coating line with drying technology. The company was asked to supply a spray coating system with drying, which also works economically with small batch sizes and saves resources.

The project objectives included cost optimisation, quality aspects, reduction of throughput times, and greater flexibility in the production process.

Venjakob took over the complete implementation of the finishing line for coating and drying matt surfaces and, except for the sanding machine, all system components and the conveyor



technology were designed, produced and installed by it.

The external sanding machine was integrated into the plant control system and the plant was to be designed in such a way that kitchen furniture components of the smallest sizes and up to 2,800-mm (length) and 1,300-mm (width) could be coated automatically in a continuous process.

Colour management

Nolte Küchen defined specific requirements for the performance of the system. Only water-based coatings were to be used and the challenge here was the variety of colours.

The system had to be able to run economically in small batches and allow for up to 20 colour changes. As each colour change takes time, a colour management system was used to keep set-up times as short as possible.

The coating process was carried out by four spray guns in high-performance linear mode. The gun speed was infinitely adjustable and fully automatically controlled.

A scanner in front of the spray booth determined the work piece shape, number and position and the guns were switched on and off precisely above the work piece. The scanner was able to detect each work piece separately and



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the measurements took place automatically.

All relevant adjustable parameters could be pre-set in any quantity at a central operating point in front of the spray booth via a touch-screen computer and called up as a spray program.

The individual programs could also be easily changed by the operator and all relevant process parameters could be stored in the system.

Drying process

Another customer requirement was short through-feed times so that the kitchen fronts were completely dry after the finishing process and the rear sides could be coated directly afterwards.

The drying process was coordinated with the manufacturer of the 2-component water-based UV coating material used. In addition, several test series were run in Venjakob's own technical centre.

Drying was carried out with rising

air temperatures. After coating, the work piece was first passed through a levelling zone for 2 minutes, followed by a flash-off channel with an air temperature of 30-35 °C.

The components were continuously conveyed on closed-belt conveyors where they passed into the jet-drying channel with a temperature of 40-50 °C.

Following drying, the coated surface was cured with UV light. The UV curing oven had its own electrical control cabinet, but was controlled via the control system of the overall production line.

A built-in real power control compensated for voltage fluctuations that occurred in overloaded or unstable power grids, ensuring consistent high-quality results.

Air supply

The required process air was supplemented by two central-supply air systems, which were project-planned by Venjakob and integrated into the overall concept.

In the area of spray coating, the supply air system worked with humidification. Before it left the unit, the supplied air was heated, cleaned and humidified to ensure

When upgrading its production, Nolte Küchen wanted cost optimisation, quality aspects, reduction of throughput times, and greater flexibility in the manufacturing process.

optimum air quality for the best coating results.

A second supply air system without humidification supplied the areas of the sanding machine, the dust removal system and the drying section.

There was a special feature in the conveyor technology where the sanding machine that was integrated into the finishing line was to be used separately. For this purpose, a movable belt conveyor on flanged rollers was installed between the sanding and the spray coating machine.

When rolled aside, the sanding machine and the spray coating machine could be used independently, while for a combined operation involving both sanding and coating, the belt remained in line and allowed line operation.

Venjakob is represented in India by Nitshaw. For more information, write to marketing@nitshaw.com.

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Three-fold advantages from Biesse



The flat table CNC machine, the Rover AS FT (L) and Jade 340 edge banding machine (R) are Biesse's first solution for modular kitchens.

Cooking spaces have evolved over the last few decades, from a structure with a stove in the corner of the house managed by a cook, to the radically upgraded, sophisticated, social place for the family.

Today's modern kitchen is aesthetically and ergonomically designed keeping the user(s) in mind for a lot more collaboration and socialisation, with sections (modules) defined for each task, keeping convenience and purpose of functionality in mind.

Modular Kitchens in many household can be seen to be fast becoming part of the extended living space for friends and family to have fun. It is steadily witnessing an increase in demand and has become one of the fastest growing businesses within the home and interior space.

The taste for Western kitchen

designs, the increasing demand for customised, high-quality, aesthetically appealing and ergonomic kitchens from Indian households, is forcing domestic modular kitchen manufacturers to adopt the best industry practices, latest materials, technologies and software to produce, assemble and install the complete modular kitchen – at a competitive price, and in a short time.

Biesse, one of the global leader and manufacturer of wood, glass and stone machinery, offers a comprehensive range of machines and software to address the challenges the modular kitchen manufacturers are facing.

Biesse provides the customer with efficient and flexible solutions for faster deliveries. Components can easily be assembled and installed on-site. Based on the volumes required by the modular kitchen manufacturers, Biesse can propose several solutions summarised as follows:

The first solution includes cutting and

drilling executed on a flat table CNC machine with nesting technology, plus the edge banding executed on a through-feed edge banding machine.

The second solution includes sizing on a beam saw, followed by edge banding on an edge bander and the drilling executed on a drilling machine.

The third solution is a completely an automatic solution with fully integrated processes. Large scale modular kitchen manufacturers can benefit most from this fully automated and integrated industry solution.

Software package

The digital revolution has led to a momentous changes based on the technological innovation that involves production systems, businesses, the market, and the relations between these areas and humans. ▶

The Selco SK 370 industrial beam saw (L), the Stream A single-side edge bander (C) and the Eko 2.1 CNC vertical drilling and boring machines are also pertinent to modular kitchen manufacturing.





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MODULAR KITCHENS

In addition to the above machining solutions, Biesse offers a complete CAD/CAM software package to take care of the production, right from design to final installation. It helps the manufacturer in every design stage, from creating solutions to the final render plan that gives a detailed preview of

the solutions which have been specially designed.

The Indian modular kitchen manufacturer needs software that can curb the complex task of programming and using machines, simplifying everyday work while guaranteeing the benefits offered by current technological advances.

Keeping that in mind, Biesse offers cutting-edge application software that is intuitive, with user-friendly machine interface which is easily adaptable for smart factory.

This software from Biesse provides design freedom, default hardware models, inventory supplier module, costing and quotation functions, machine integration, compatibility with third-party software, and planning and assembly processes. (www.biesse.com)



Large scale modular kitchen manufacturers can benefit most from this fully automated and integrated industry solution from Biesse.

Moisture-resistant boards from Adlerwud



Adlerwud is acknowledged as one of the best MDF/ XDHMR/ pre-laminated board brands in India. One of its USPs is that the products are moisture-resistant and are ideally used in kitchens and bathrooms.

Adlerwud XDHMR (high density high moisture resistance) boards are being manufactured using hard wood, so the density of the product becomes better than other products available in the

market. The boards have the best routing characteristics due to their uniform density gradient and compact core.

This is achieved by using special German technology for mat formation in an 8-cylinder, 22-daylight press in their production.

Interestingly, advanced XDHMR wood is derived from plantation trees, agricultural

waste and forest wood waste and helps in protecting the environment.

MDF doesn't require too much maintenance; all it needs is a quick wipe down for any dirt or slight stains for it to remain in top condition.

The XDHMR board comes with a 5-year warranty and, if cabinets are properly maintained, there is no reason they shouldn't last even longer.

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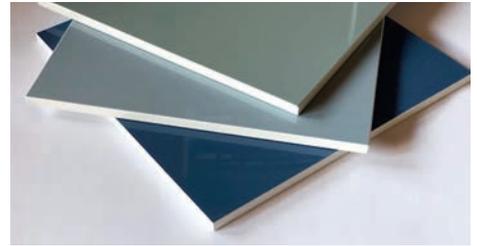
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Health & customer friendly choices from Asian Prelam

The global modular kitchen industry is witnessing unprecedented growth, driven by use of advanced materials, fabrication equipment and speed of execution. The primary components in building these kitchens are panel products and hardware.

Asian Prelam is creating a one-stop solution that will cater to kitchens with a very high visual appeal, remarkable feel and touch, health benefits, and weather resistance – all at attractive price points.

Panel products are characterised by the quality of the substrate and the visual look that covers it. For substrates, Asian Prelam offers a

wide product range, starting with the premium BWP birch plywood to the popular HDF HMR with V-313 grading, and the latest HD HMR chipboards in V-313 E1 grade.

These offer superior, health-friendly (E1 grading), weather-friendly (HMR with V313 grading), and hardware-friendly (high density) benefits.

On the aesthetics front, Asian Prelam offers multiple options for all kinds of budgets, feels and looks. For the high-end bracket, there is Glassenza, a superior alternative to back painted glass; Acryline premium-coloured products with multiple surface finishes; and Acrylook which is budget-friendly too.

For the more adventurous, Asian Prelam offers a wide range of textured surfaces with the look and feel of wood. For the

cost-conscious but no-compromise look, there is also the beautiful flat sude-finished melamine surfaced options in more than 100 colours and decors.

Recently Asian Prelam introduced Vogue, a custom-made design series that is unique to the company. This comes with off-the-shelf availability for home projects and can be further customised for large scale requirements.

With Vogue, Asian Prelam now offers the power to also create your own laminate design with your choice of colours and custom branding options.

A further extension provides specific surface textures to match the design for an even more realistic feel, spread across stone, fabric and wood designs. With so many benefits on offer, Vogue truly stands out as the product designed for the living and working spaces of tomorrow.





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Re-modelling ideas, new designs from Aryamman

New-age requirement for home interiors is seeing a transition between kitchens and other areas of the home as the epitome of modern living. One always wishes for a kitchen that would serve the needs of the family in a way that is both aesthetically pleasing and highly practical.

Re-modelling the kitchen has become one of the most important home improvement projects. The year 2023 will usher in fresh kitchen trends: designs will become more practical and thoughtful, heading towards a minimal, yet elegant aesthetic.

The use of more natural looking surfaces with an aura of innovation – such as coloured marbles, stones and metals, with a modern touch of texture, colour, design and

depth – also promise features like anti-stain, anti-bacterial, scratch removal technology, water repellent, anti-finger print which are required for the functionality and yet add the aesthetical touch.

Surfaces for kitchens in 2023 will gain depth and character from the use of contrasting wood and metal tones. The new generation of kitchen furniture is going to demand surfaces which are based on innovative materials with design and that can be used with flexibility.

The surfaces collection by Aryamman Interior Solutions offer solutions to both needs with elegant designs that transcend the conventional boundaries. With warm colours, and a large selection of innovative Technomatt SRT made-in-Italy super matt surfaces also include the modern marble range with

the eclectic touch of stone.

The entire range of Technomatt SRT series consists of the solid colours and the eclectic marble range promises features like scratch removal technology, anti-stain, anti-fingerprint, water repellent and low reflectivity of light.

SynchronPly is a range with an organic design of synchronised veneer effects on plywood with beautiful natural wood grains and woven linen textures, which brings the natural warmth to the social life of your home.

Classic, a selection of luxury acrylics with a liquid metal range in high gloss and super matts, is the ideal solution for a modern home that transcends the conventional boundaries.

Aryamman Interior Solutions will be showcasing its new designer range of surfaces for 2023 at DelhiWood (4-7 March, 2023), Greater Noida.

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Smart kitchen solutions from Ebco



Pro-motion drawer system (L) and bottle pullout soft-close with glass.

Ebco's Livsmart systems and accessories segment includes drawer systems and accessories, corner solutions, overhead systems, midway systems, waste bins, roll top shutter and more.

Its wide range of fittings, offers a complete solution for modular kitchens, right from organised drawers to corner solutions, overhead lift systems to easy

pullout storage and more.

Its products include office furniture fittings, drawer slides and hinges, general hardware, joinery fittings and screws, furniture locks, retail display systems, window-door fittings, window, door and glass hardware, kitchen systems and accessories, aluminium profiles and handles, bed and wardrobe fittings and accessories, as well as LED furniture lights. To know more, visit www.ebco.in.



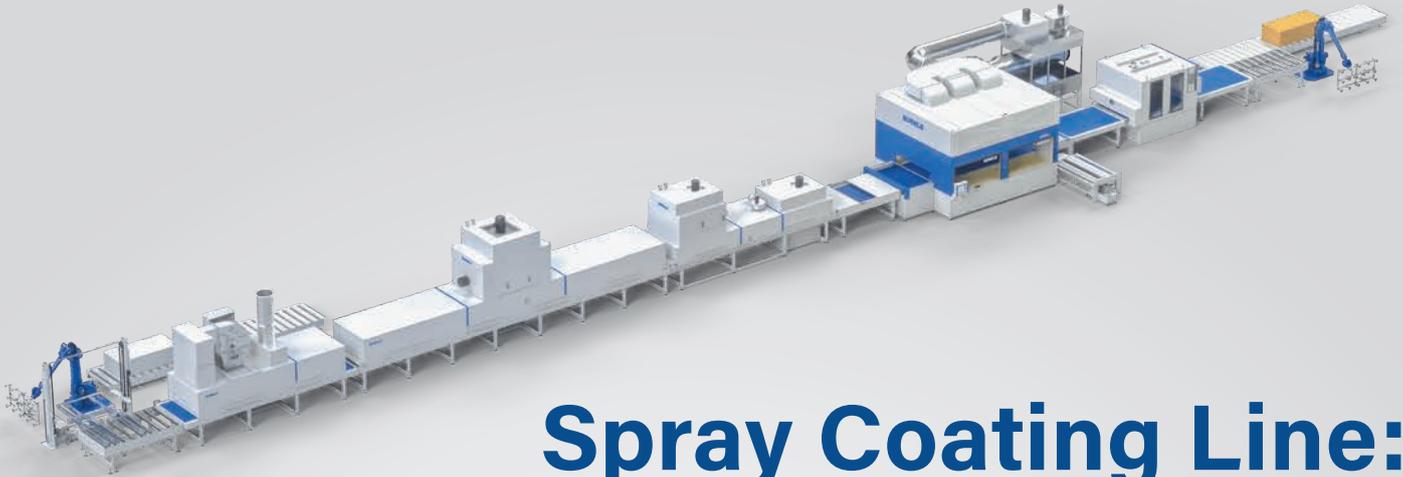
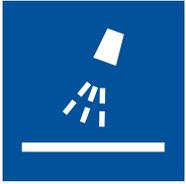
Double corner pullout.



Eurolift bi-fold door system (L) and kitchen pull-down system.

Elegant Zen handles can easily steal the show in any modern kitchen.





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- ▶ Two different applications for optimal coating results: rotary and reciprocating system

FEATURES AND EQUIPMENT PACKAGES

- ▶ One - time conveyor belt with vacuum table or PVC conveyor belt with coating recovery system and belt cleaning.
- ▶ Control cabinet integrated into the machine, simple and easy - to - understand control with the Bürkle design.
- ▶ Scanner strip for workpiece recognition.
- ▶ Robust machine frame for low - vibration coating.
- ▶ All filter units are fitted with a quick - change system. 5 filter levels result in perfect air purification and ideal air quality in the spray cabinet and ensure high quality results.

Nova Pro Scala: no glueing, drilling, tensioning



Nova Pro slide technology, already proven millions of times over in practical use, is now progressing to the next generation. With the comprehensive new drawer range, Nova Pro Scala, Grass is presenting a system which offers the variability to harmonise with the contemporary styles of tomorrow's living spaces.

The innovative drawer system represents a true design innovation that sets new standards. This is borne out not only by the keen interest within the kitchen and furniture industry but also by the recent award from the German Design Council for Excellent Product Design.

The drawer side families, Nova Pro Classic and Nova Pro Deluxe, have excellent running characteristics, smooth movement and low opening forces with the Nova Pro movement system.

The comprehensive new drawer solution creates maximum scope for creative styling as well as enabling efficient production processes. The company has minimised the space required to house



the technology, to ensure full use of the scope for creative styling.

Even the tilt angle adjustment was optimised so that it could be accommodated in a drawer side height of exactly 41 mm.

Covered in laser-welded, powder-coated steel, the drawer side is unique and makes it the complete drawer with almost limitless design options. Thanks to its right-angled shape, the intentionally understated metal version can be combined with designer panels to suit all tastes, such as premium mineral resin surfaces or luxury real wood versions.

The multifaceted Scala range includes drawer solutions with heights of 63, 90 and 122 mm, as well as a snugly fitting railing version and a new, stunning-looking drawer with a height of 186 mm.

Special attention was paid to simple processes in drawer production. The cabinet dimensions and drilled holes of the standardised technology remain the same. Pre-fitted attachment posts for the glass panels on the Nova Pro Crystal Plus make work even easier.

This solution does not require any glueing, drilling or tensioning of the add-on elements. In addition, it features innovative clip technology – the design elements can be fitted securely and easily without the use of tools.

The modular front connection on the drawers guarantees maximum stability with minimum part complexity and the drawers and fronts can easily be replaced.

The basic Nova Pro has been extended by some practical functionalities: with a new longitudinal division for railing pull-outs, it is possible to adapt the drawer system to the individual requirements of users.

The Nova Pro child lock keeps children safe by preventing them from accessing the contents of the drawer. The system is fitted concealed and can also be retrofitted as an option.

In addition to these new developments, the Nova Pro steel back panel can now also be simply installed by using a separate clip, without any additional assembly aids; a sink splashback holder makes it possible to produce drawers with a cut-out for the waste trap quick and straight.

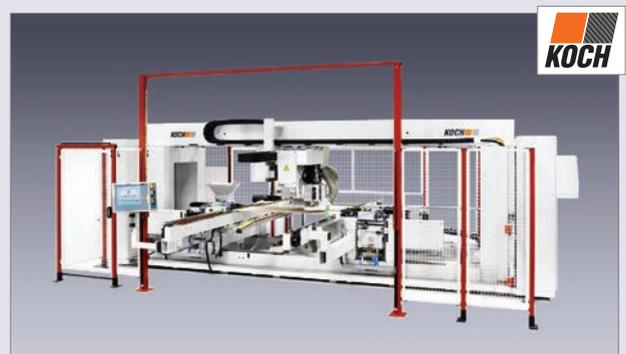


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Premium kitchen solutions from Hafele



MatriBox Premium three-drawer stack comes equipped with soft-close as well as push-to-open functions.

Hafele has recently launched a new range of kitchen and home solutions that include the Matrix drawer and runner systems, free flap fittings, Metalla 510 furniture hinges and wire storage solutions.

These products reflect the strong competencies that Hafele holds in research, development, engineering and manufacturing, and the new global range of kitchen and home products that strengthens its position in the market.

The company's in-house range includes MatrixBox premium drawer systems, which operates smoothly, opens swiftly and closes with precision. This premium drawer system features simple assembly and easy adjustment as well as unrivalled design and flexibility in application.

It is suitable for installation in kitchens, bedrooms, bathrooms and home offices, as well as commercial and industrial environments. MatrixBox Premium offers the widest range of accessories and comes equipped with soft-close as well as 'push-to-open', soft-close runner system functionalities in weight carrying capacities of 35 and 50 kg. It is available in Metallic Anthracite, Metallic Silver and White finishes.

The drawer system is a sophisticated slim design and operates smoothly, opens swiftly and closes with precision. The system, with 13-mm-thin drawer sides, features simple assembly as well as unrivalled design and flexibility in application.

It is suitable for installation in kitchens, bedrooms and bathrooms and comes with three height options, two side design options (solid and décor) and two weight carrying capacities (40 and 60 kg); giving the widest choice for a host of applications.

With an integrated soft-close and synchronized runner technology, the movement of these drawers is smooth, stable and precise. The attractive Graphite Grey finish brings sophistication and

elegance to home designs.

The range of under-mount runners comes with elegant motion technology that can suit a host of applications within kitchens, living room furniture, bed storage units, wardrobes and bathroom units.

Available in four weight-carrying capacities (60, 40, 35 & 25 kg) and a large range of nominal lengths, the under-mount runners can execute any required drawer design. The 40- and 60-kg runners come with synchronised technology providing excellent motion and stability to the drawers.

All runners come with an integrated soft-close mechanism that offers smooth and noiseless closing of the drawer units.

The free flap fittings open up more opportunities in the visual and technical design of furniture and have tangible benefits compared to hinged doors and give the furniture and the room elegance and lightness regardless of whether a flap is lifted, tilted, swiveled or folded.

The free flap family fulfills the demands for creative freedom, choice of material, design, ease of installation and convenient operation on a whole new level. To put it simply: They are slimmer ▶



Hafele's free-fold hinge systems come in various sizes, functionalities and weight-bearing ratings.

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MODULAR KITCHENS

and lighter and simpler to install.

Designed with perfection and conceived to perform, the new Metalla 510 hinge range adds efficient functionality to kitchen cabinets. The standard application hinges from this range for shutters made from wood or with wide aluminium frame comes with an opening angle of 105° and constitute full-overlay, half-overlay and inset applications respectively.

For shutters made with narrow aluminium profiles, the range houses a special aluminium profile hinge with the same

opening angle. Metalla 510 includes a 155° wide-angle application hinge for cabinets with internal drawers or shelves.

All hinges from within this range come equipped with an integrated soft-close mechanism in the hinge cup which can be activated via a damper shifter, at an opening angle of either 30° or 10°, for a smooth and noiseless closing.

Among Hafele's wide range of storage solutions are larger units of varying capacities.



Senosan: films with great functionality



The Austrian plastics specialist, Senosan, is known for its high quality and innovative plastic surfaces. With highly scratch-resistant lacquer coatings, new standards for furniture films have been created in recent years and its dirt-repellent, anti-fingerprint and velvety feel from the super-matte surfaces.

The senosan AM800 TopMatt AF

surface has a matte structure with unique anti-fingerprint properties. The surface is not only dirt-repellent but also features a particularly velvety feel quality.

This third generation of the super matt film has established itself and has been nominated for the State Prize for Innovation 2021, the highest honour to be awarded by the Republic of Austria.

As a result of Covid-19 and the resulting

ever-increasing hygiene requirements, all lacquered Senosan surfaces, whether high-gloss or matte, as well as all glass surfaces, will now also have an anti-bacterial finish, reducing bacteria and germs by 99.9% within 24 hours.

This anti-bacterial effectiveness has been tested as per ISO 22196 /JIS Z2801 and confirmed by an independent, certified testing institute. By using new technology, the conventional use of controversial silver ions and/or copper sulfite can be dispensed with.

The recycling concept developed and implemented at Senoplast ensures that almost all production and processing waste can be re-incorporated to a certain extent in the ongoing production process.

In addition, Senoplast has invested in a new regenerate processing plant, which makes it possible to retrieve plastic recyclates from the market, process them accordingly and use them again in existing products. (www.senosan.com).

MASTER PIECES FROM TAIWAN FOR BOTH SOLIDWOOD & PANEL INDUSTRIES



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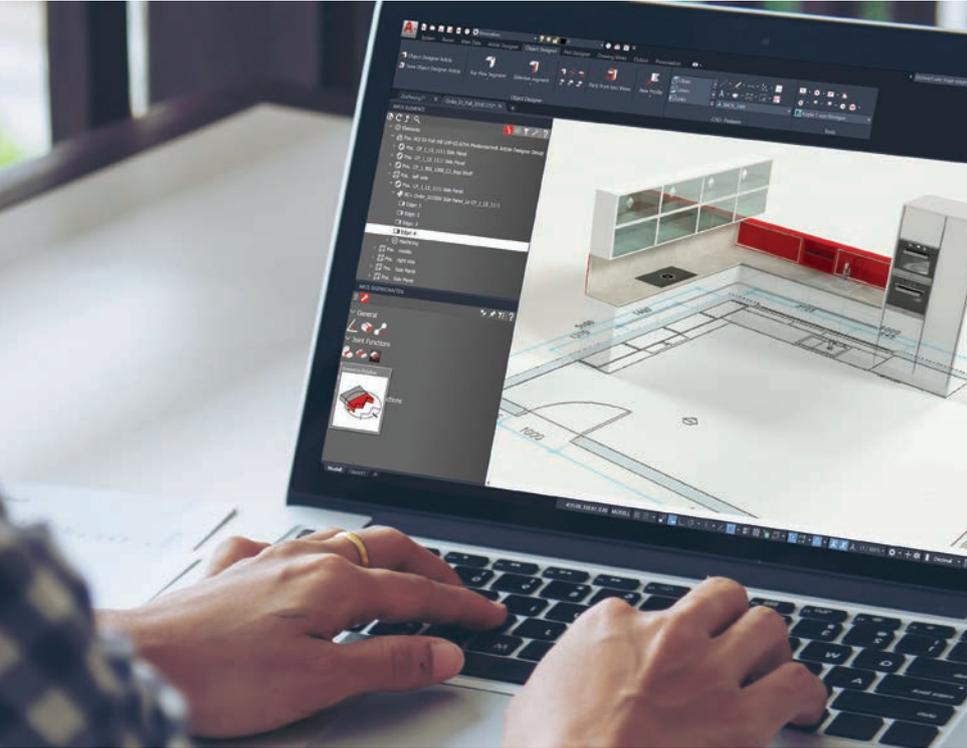
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imos marries design and production



With imos iX 2021, imos offers a software solution whose functionalities are specially optimised for the planning, sales, design and production of kitchens.

Already at the point of sale, iX 2021 offers professionalism and comfort and complex 3D room situations can be easily created via intuitive user guidance for dimensioned floor plans. Smart interfaces enable the integration of digital room recording systems.

In the carcass configurator, catalogue furniture is selected and adapted to customised requirements in a rule-tested manner. Freely designed special constructions are also possible.

Intelligent insertion and snap functions support the exact positioning of articles and even

entire assemblies in the three-dimensional room. Purchased parts, such as sinks, refrigerators, freezers and electrical appliances or lighting elements, can be inserted by drag-and-drop and integrated into the design.

A professional presentation can be achieved through photo-realistic representations – functions, such as

opening cabinet doors or drawers, can be simulated, and enable a view into the interior of the furniture.

Extensive libraries provide tasteful interior and exterior design elements, while realistic lighting simulation puts the planning in perspective. imos' servers can support the rendering process – high-resolution HDR images are thus generated in just a few minutes.

3D planning can also be integrated into VR and AR programs and experienced virtually. Planning is done mobile via cloud-based applications or stationery via desktop solution.

For different business models, B2C products are available for the integration of the end customer, as well as B2B products for the professional planner in the showroom or salesroom.

Comprehensive sales documents such as floor and elevation drawings, photo-realistic views and a quotation with price information can be issued to interested customers at the push of a button.

The digital order, including the planning information, is transferred directly to order processing and preparation, eliminating manual processing. The continuous data model and parametric



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MODULAR KITCHENS

design make changes to the order easy.

Furniture is designed using wizards that generate a parametric carcass model quickly, taking company-specific rules into account. From this, digital twins of the saleable furniture can be derived and processed for sales and production.

Worktops with individually adaptable contours and long parts are generated automatically.

In the process, iX 2021 considers divisions and cutouts for appliances, sinks and sockets. Fittings can be flexibly customised and varied, like surfaces, colours and materials, because the

extensive fitting data from leading manufacturers are available directly via download from the cloud.

iX 2021 integrates into existing IT environments or ERP systems, ensuring an automated ordering process. The order-related CNC data iX 2021 generates automatically as well as all relevant manufacturing data (including special parts), both for individual machines and for industrial manufacturing plants.

There is no longer any need for order folders with paper documents: by uploading to the cloud, all order data is always available on mobile devices such as tablets or smartphones for production,

assembly and the construction site.

Three-dimensional design views allow a look at all details, including the fitting situation, while clear lists provide information on components such as dimensions, edges or purchased parts.

Individual parts can be identified on the construction site using the scan function. An integrated chat function enables the secure exchange of data and information between the construction site, production and the office.

High-efficiency drilling center from Woodtech



The Rapid Drill-610HZ is a high-efficiency, six-side drilling center for wood panels. The machine has an upper drilling head along with a 5.5-kW spindle and five pieces auto tool change. It is compatible to diversified CV data formats.

It is mainly applied in six-side hole of all kinds of artificial panels, including hinge hole, through hole, half-through hole, and horizontal drilling.

It can simultaneously process symmetrical hole positions and also can hog, mill and process invisible parts with small spindles.

Features

Five types ATC for spindle ensures easier handle hogging, milling, lamella and other craft. The 5.5-kW spindle helps achieve rapid and convenient hogging and milling; the saw blade can do 50-850-mm linear hogging.

The double translation air flotation table allows flexibility according to the hole position to improve drilling precision and avoid dust accumulation at the bottom. The software can simulate processing path to predict the processing time.

Processing record statistics can be monitored to view production progress in real time

Additional Features

- Drill package:UP:12V+8H
Bottom:9v
- Drilling area optimization, lower drilling bit fully covered to improve efficiency.
- 5 liner tool magazine with large capacity, can install various tools, and is used for hogging, milling, and multi-slot processing.
- Achieve visual processing path simulation, predict processing time.
- Double gripper with 3.8-metre-long guide rail, max moving speed 140 metres per minute. Avoids interference between gripper and board and makes it more efficient.
- ATC air-cooled spindle ensures higher power and processing efficiency.

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14 x 14 x 2 x 37°



Heavy Duty Helical Planer Cutter Heads with Changeable Knives
Knife: 30 x 12 x 1.5 x 35°



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Knife: 15 x 15 x 2.5 x 30°
15 x 15 x 2.5 x 37°



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50 x 12 x 1.5 x 35°
60 x 12 x 1.5 x 35°



Changeable Knives / TCT



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Finger joint cutters
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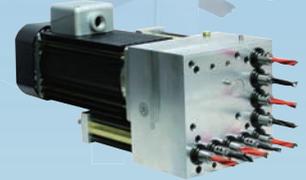
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MODEL	PITCH
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WD212	32-160mm
WD213	18-100mm



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MODEL	PITCH
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Neat & tidy: Kesseböhmer magic



Clever Storage makes life easy by keeping everything organised in just one pull-out.

Cooking Agent from Kesseböhmer is a product with the inbuilt feature of Clever Storage, a concept promoted by Kesseböhmer. It is a must-have product in all well-organised kitchens.

It is a product with storage flexibility for multiple items used daily in the kitchen, be it spices, condiments, oils, cooking tools, chopping boards, spatulas, etc. It makes life easy by simply keeping everything organised in just one pullout.

Everyone has a "drawer of horrors" at home. Organising storage cans in the drawer is a difficult task and it urgently required restructuring! Introducing the SpaceFlexx filing system from Kesseböhmer.

The space-saving, intuitive and highly flexible SpaceFlexx sorts your drawer, tidies up contents with a stable frame that serves as a framework and connects the freely movable, highly elastic Nesttex dividers.

In between, we put in what we want to store. Whether large or small, square or round – everything finds its fixed place and is immediately sorted in a non-slip and space-saving manner.

This is a perfect solution that makes us all happy. As we all know, it's the little things that matter the most in life.



The SpaceFlexx filing system has highly elastic Nesttex dividers that serve as a framework.

Blum @ caple.in from 1st July 2022

Hinge Systems



Lift Systems



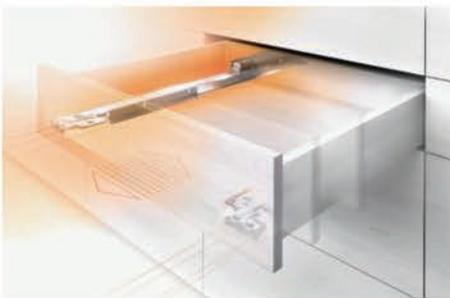
Motion Technologies



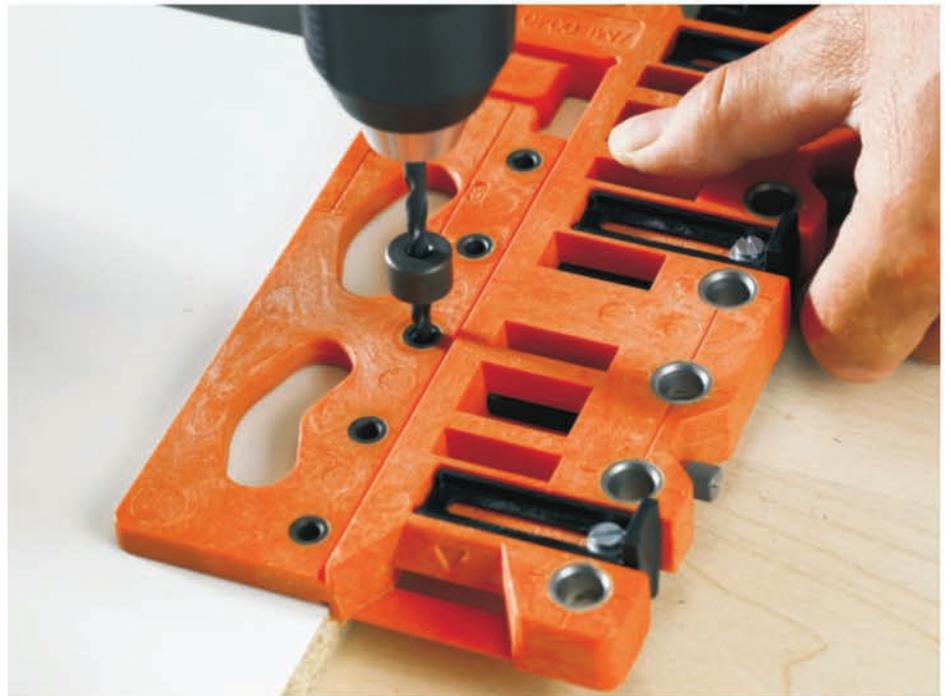
Cabinet Applications



Runner Systems



Universal Jigs



Templates and Jigs



Assembly Devices



Unicol adhesives for flat lamination



Hot-melt polyurethane reactive (HMPUR) adhesives have been developed for applications where a superior bonding quality is required, particularly for bathroom or kitchen furniture panels, where moisture resistance is a key driver.

After cooling, the glue line builds up a high strength of the bonded materials. Between 1 and 5 days, we have the complete curing of the glue, allowing it to reach high bonding properties. Once the product is cured it cannot be re-activated as an EVA hot-melt.

HMPUR adhesives can be used for bonding different types of substrates and overlays used in

the kitchen, bathroom, and door production, parquet manufacturing, and PVC and aluminum windows profile wrapping.

Unicol, an Italian company, offers Unipur 8401, along with a wide range of HMPUR products to satisfy multiple applications from different industrial sectors such as the woodworking, panel-making, textile and tissue industries.

Roll coating machinery allows the application of HMPUR adhesives to a variety of flat sheet substrates, both evenly and efficiently, via a series of automated rollers.

The roller coater is normally equipped with a heated chrome-plated dosing roller and a rubber application roller.

A pressure roller, located under the application roller, is used to drive the panel under the application roller.

Double-sided roller coaters are available to allow both sides of a panel to be coated. The adhesive is normally applied to the rollers through a drum melter. A level control sensor, situated in the roller coater, controls the amount of adhesive in the reservoir. The melter equipment must be hermetically sealed to prevent curing reactions inside of machinery.

Total Tools & Equipment is the exclusive distribution partner of Unicol Adhesive Technologies in India. For further information, write to inquiries@ttaltoolsin.com

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Turkish lines for lamination, wrapping



The **foil slitting machine** slits PVC and PP foil bobbins up to 0.40-mm thickness and in 700 mm or 1500 mm width. Unimak is represented in India by Nitshaw. For more information, email marketing@nitshaw.com.

Unimak, the Turkish manufacturer and exporter of machinery, equipment and facilities to more than 70 countries, has a manufacturing facility in Tuzla Kimyacılar OSB, which is 4,000 square metres. This investment decision takes into account expansion 10 years from now for pre-sale and after-sale services, storage space and development of production planning.

Unimak's business is in continuous growth, resulting in the additional purchase of a new, 40,000-square-metres production facility in the industrial estate at İmes Yalova Specialised Organised Industrial Zone.

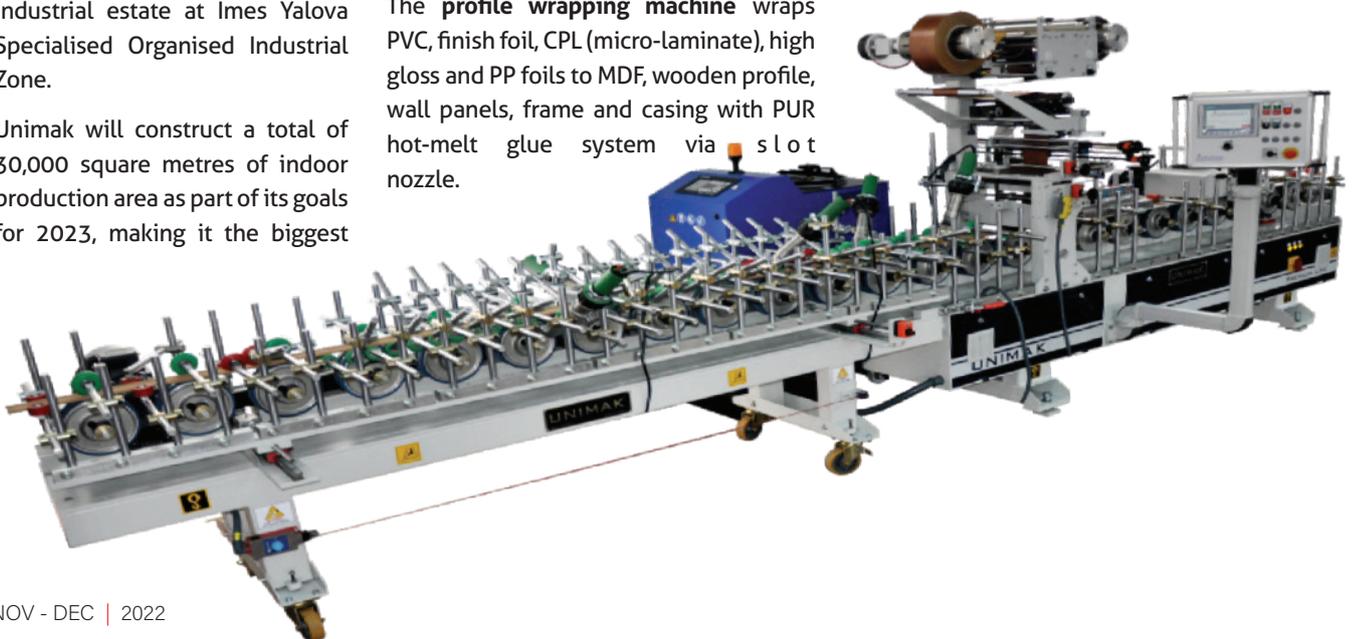
Unimak will construct a total of 30,000 square metres of indoor production area as part of its goals for 2023, making it the biggest

and most modern facility of woodworking machinery industry in Turkey and in the world.

Its **surface lamination lines** can cover up to 1350-mm in width for MDF, chipboard, wall (sanded) panels, XPS and EPS polystyrene sandwich panels, etc.

The reverse roller equipment imparts high gloss lamination to the materials that are suitable for sheet or roll type lamination such as acrylic, PP, ABS, PET, finish foil, laminate, natural veneer with an external PUR hot-melt adhesive melting systems.

The **profile wrapping machine** wraps PVC, finish foil, CPL (micro-laminate), high gloss and PP foils to MDF, wooden profile, wall panels, frame and casing with PUR hot-melt glue system via slot nozzle.



FGV introduces new, slimmer drawer system



The kitchen is one of the most important spaces in the house and having the appropriate fittings and drawers is a must. The product portfolio of FGV-by-Hindware

includes international quality kitchen and furniture fittings comprising products like hinges, telescopic channels, under-mounted channels, drawer systems and

lift-ups, among others.

FGV products go through stringent quality checks, keeping international standards in mind. This not only ensures product quality but also a long-lasting product life that come with up to 20 years of functional warranty.

The recent introduction to the portfolio is the Unilux slim drawer system, which goes through over 90,000 cycles of testing and comes with different finishes.

It is designed to suit the needs of modern Indian households, featuring an elegant and sleek, premium-looking design with a key focus towards ease of use and operations. Under the bodywork sits a state-of-the-art sliding system with extremely smooth gliding functions.

Backed with the most powerful damping mechanism in the market – SlowMotion damper – ensures that the drawer is closed seamlessly every time it is used. Dual synchro rack-and-pinion included in the slide address concerns like stability. It comes with an all metal front, making it look simple yet sturdy.

The Ten Drawer system has a drawer depth of up to 550 mm, which helps store things efficiently and becomes the complete fitting solution for every house. It has especially been introduced keeping the specific requirements of Indian households.



Seamless functionality from Hettich



Blaupunkt's range of built-in hoods, hobs, microwaves, ovens, dishwashers and refrigerators are now marketed by Hettich.

Gone are the days when placing as many cupboards and drawers in the kitchen was the best storage solution. Hettich pull-outs, lift-ups, pre-fabricated wire baskets, organiser trays, and corner carousels have changed not only the way one stores things in the kitchen but also the way it looks.

Built around modularity, coupled with contemporary designs, Cargo wire solutions from Hettich can come to one's rescue and transform any piece of furniture into an efficient storage solution.

Hettich AvanTech You drawer systems, with thousands of internal organiser options, and Cube Plus shelving system, with different modules, impart one's signature style and functionality.

Kitchen solutions such as larder units, bottle pull-outs and corner solutions enable one to use every inch of space in

the kitchen effectively.

While it is relatively simple to incorporate modular kitchen units in accordance with the rest of the interior design, kitchen appliances are a whole different story. It is often difficult to match the stark white or dull grey of white goods with the rest of the kitchen.

This too is beginning to change with the advent of built-in appliances that are designed into kitchen cabinetry or walls, providing a seamless, integrated look for modern kitchens.

Blaupunkt's range of built-in kitchen appliances marketed by Hettich comprises hoods, hobs, microwaves, ovens, dishwashers, refrigerators and more. These appliances, made with cutting-edge German technology, provide the right blend of functionality and aesthetics to power new-age kitchens.

Apart from its CargoTech system, Hettich has in its inventory several well-engineered options for larder units, pull-outs and corner solutions.



- Wide Range of Models
- Varied Technical Parameters
- Easy Selection for a Specific Machine Model



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NEXT GENERATION DIAMOND TOOLINGS



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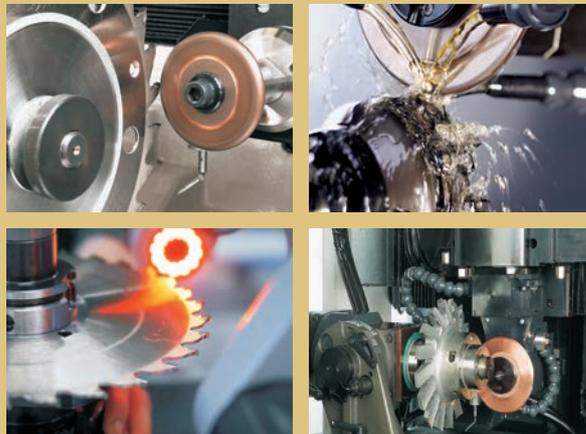
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- Circular saw with 45° tilting.
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Beam Saw

- Selectable air blowing table: an essential tool.
- Saw carriage with independent raise of the blades.
- Increasing of productivity up to 30%.



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Edge bander

- Simple and intuitive.
- Ideal edge application.
- Quality finishing and versatility.



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Edge bander

- Premilling.
- Partial corner rounding.
- scraping.



olimpic k 360 r

Edge bander

- 11 m/min panel feed speed.
- "AUTOSET" pneumatic positions of units.
- Pre-milling, corner rounding, scraping units.



stefani kd

Edge bander

- 10-20 m/min panel feed speed.
- Solid wood up to 12 mm thickness.
- "SGP" glue pot for EVA or PU glue.



stefani xd

Edge bander

- High productivity with corner rounding up to 30 m/min.
- The use of EVA and Polyurethane glue is made possible.
- Zero glue line possible with "AirFusion" technology.



morbidelli m100

CNC machining centre

- PRO-SPACE safety systems, it requires less floor space.
- JQX : 5-axis direct-driven spindle head.
- 60% time saving in drilling cycles.



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- Sliding Table Panel Saw | Automatic Panel Saws
- Manual Beam Saw | CNC Beam Saws
- Through Feed Edge Banding Machines
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Transparent wood: new sustainable material

PRIYA BISHT & KRISHNA K. PANDEY

Wood is one of the oldest raw materials that humans have been using for centuries for construction and housing, agricultural implements, fuel, paper and pulping, etc. It is a renewable material, bio-based with great capabilities to sequester carbon.

Natural wood is opaque due its distinct colour and chemical constituents. The colour and natural grain of wood confers an aesthetic appeal to it. In recent years, wood has been used as a sustainable raw material for developing noble composite materials for specific applications.

Natural wood is composed of three main structural components: cellulose, hemicellulose and lignin. Cellulose and hemicellulose are both colourless; whereas lignin is a phenolic polymer which, along with extractives, impart colour to the wood.

It contains several chromophores groups (carbonyl groups, quinones, conjugated double bonds, etc.) which lead to maximum light absorption in wood. Lignin alone is responsible for more than 80% of the light absorption in wood (Müller *et al.*, 2003).

Additionally, wood made of several

extractives and inorganic compounds which contribute to the natural colouration and light absorption in wood.

One of the recent developments include a see-through, clear and transparent wood with fascinating properties. Transparent wood composite (TWC) is a new wood-based polymeric material prepared by two-step process of delignification and/or lignin modification – the bleaching of wood substrate followed by polymer infiltration.

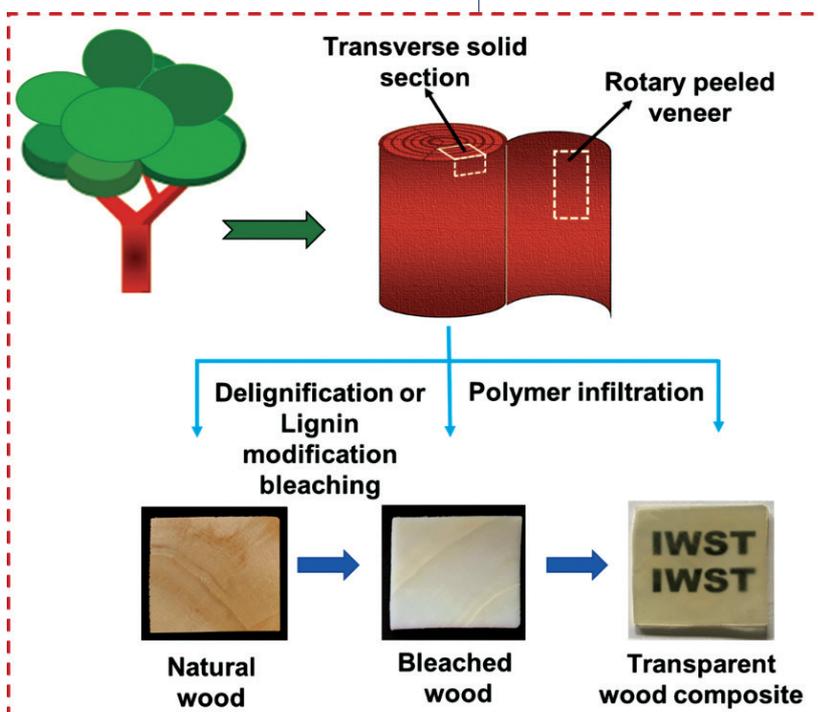
Application areas

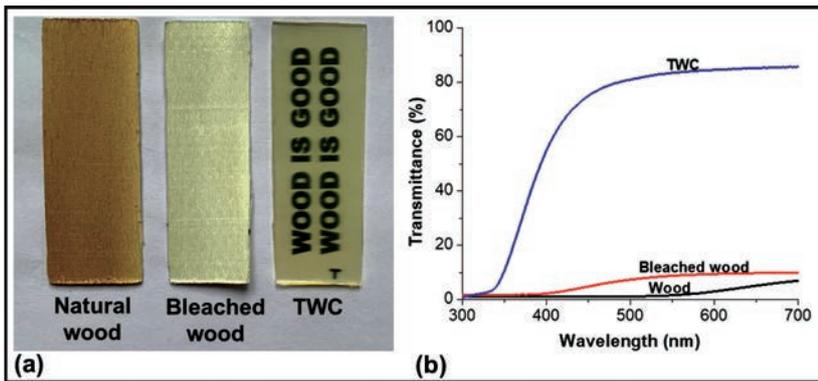
Considering the light weight, low density (1.1 gm/cm³) and low thermal conductivity of TWC the material has been considered as a suitable replacement for glass, where it can provide better thermal insulation, uniform and consistent daylight illumination without any glare – as well as without changing the living temperature.

TWC has the potential for use in energy-efficient buildings elements. The material presents light management and heat shielding abilities. Owing to its unique high transmittance and high haze nature, it aims to provide better thermal insulation delivering a calm and uniform indoor temperature without any glare or shadowing effect (Li *et al.* 2016).

TWC exhibits high optical transmittance and high haze in the visible wavelength range. It also demonstrates favourable mechanical properties and thermal stability. Wood with light colour, low density, high porosity (such as poplar and balsa) is preferred for the easy and

A schematic diagram showing preparation of TWC.





(a) Natural wood, bleached wood and TWC; (b) Transmittance spectra of 2-mm-thick TWC.

smooth fabrication of TWC.

TWC has been conceptualised for thermal energy storage systems, light diffusers, smart windows, flexible devices, packaging, etc.

Due to its attractive features, TWC provides promising scope of utilisation in light transmitting and harvesting devices, energy-efficient elements, smart windows and roofs, display panels, solar cells and other materials.

Play of light

The alignment of vessels / channels and other elements behave as light-guiding agents within the TWC substrate. Due to the unique display of simultaneous high transmittance and high haze, it has been recommended for use in solar cell substrates.

An overall improvement in power efficiency of around 18% was found by placing a TWC sheets over a GaAs (Gallium Arsenide) solar cell (Zhu *et al.* 2016). In another study, the assembly of TWC with Perovskite solar cell results in enhanced power efficiency of 16.8% (Li *et al.* 2019).

In order to attain light transmitting characteristics, a material should have low minimum light absorption as well as minimum light scattering within its interface. Therefore, to fabricate a transparent composite originating

from wood, the prerequisite step is to reduce light absorption in wood and minimise light scattering due to voids present in wood structure.

The fabrication process is basically a chemical modification of natural wood. In the first step, lignin can either be largely extracted from the wood or can be selectively modified by only targeting the chromophores present in lignin.

Extractives are non-structural elements

that can be easily extracted with the help of solvents. Through successive bleaching, natural wood is converted into a cellulose-rich, white wood substrate with improved porosity.

The white wood still causes light attenuation (scattering and absorption) within its interface due to mismatched refractive index among wood polymer (cellulose and hemicellulose) and air trapped in the lumens.

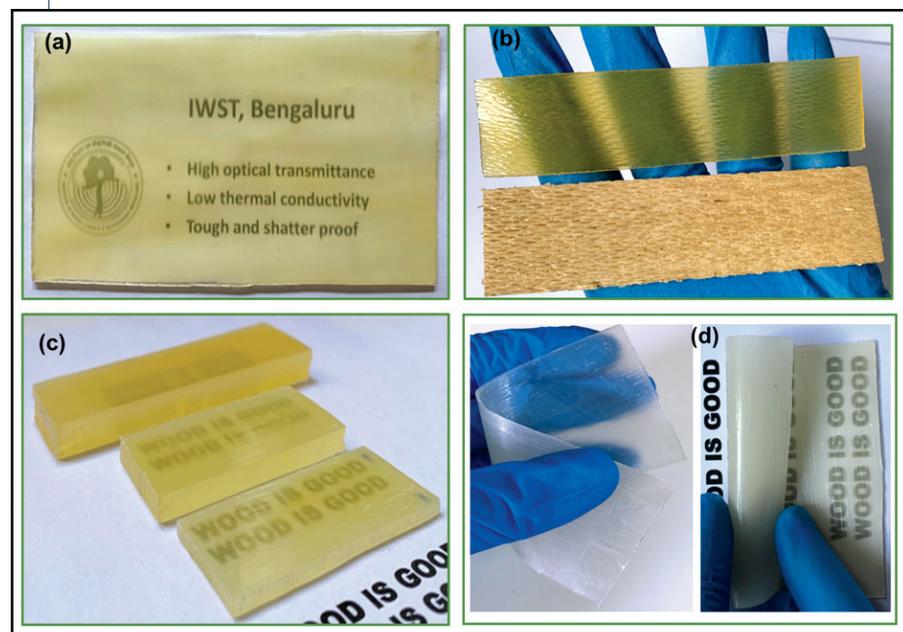
In addition, wood is an anisotropic material and possess multi-scalar dimensions within the wood cell – vessels, fibres, pits and cell wall layers – that cause light scattering.

Therefore, in the subsequent step, a suitable polymer whose refractive index matches closely to that of wood cellulose is filled inside the porous wood to construct a homogenous transparent substrate. These suitable polymers include epoxy resin, poly methyl methacrylate (PMMA) and polyvinyl alcohol (PVA).

Fabrication process

To reduce light absorption in wood, lignin can either be completely removed by de-lignification or selectively modified by targeting only the chromophores present in its matrix by lignin modification bleaching. De-lignification utilises acid chlorite to bleach or de-colourise wood, resulting in drastic reduction in the lignin level.

(a) TWC prepared from longitudinal poplar wood veneer section and epoxy resin; (b) TWC produced from silver oak wood with retained intrinsic grain pattern of the wood; (c) thick multilayered TWC from *Melia dubia* veneer; (d) Flexible TWC prepared from *Melia dubia* wood veneer and polyvinyl alcohol.



This is not favourable because lignin also acts as a binding agent within cellulose microfibrils to impart mechanical strength. The bleached wood obtained through de-lignification was found to be structurally unstable and fragile. Moreover, harmful chemicals and toxic effluents from de-lignification had the potential to cause health hazards.

As an alternative, a relatively green, less time-consuming, alkaline-based lignin modification bleaching approach was evolved (Li et al. 2017). This method leads to large preservation of lignin within the bleached wood substrate by specifically targeting the chromophores units and retaining 80% of lignin (Rao et al. 2019).

This method leads to a structurally stable wood substrate, which is essential to provide mechanical strength to the TWC. After obtaining white wood substrate, the lignin modified samples were dehydrated using acetone to prepare hydrophilic wood substrate compatible with hydrophobic polymers such as epoxy and PMMA.

If hydrophilic polymer such as PVA is used, the step of acetone dehydration is not required. Subsequently, bleached wood samples were infiltrated with a suitable polymer (epoxy) using the vacuum impregnation method.

Under the influence of vacuum, the air inside the lumens is forced out and replaced with epoxy. The epoxy-saturated wood substrates were then placed in between transparent polyester sheets and cured for 24 hours at room temperature to obtain solid TWC sheets.

When obtained in this manner, TWC exhibits high optical properties with transmittance of ~83% within the visible wavelength range, in contrast to

opaque wood, where the optical transmittance was as low as 3%.

Economically viable

Through the simple two-step process, a structurally stable, strong, clear and transparent wood composite is obtained with superior optical characteristics, favorable mechanical and good thermal properties (Li et al. 2016; Bisht et al. 2022b).

Owing to its shatter-proof nature and low thermal conductivity (~0.36 W/mK), it has potential as a sustainable alternative to glass and plastics. Low density, light coloured, highly porous wood such as balsa, beech, poplar, etc., are suitable for fabrication of TWC.

Such wood species allow fast and easy processing, which can be economically viable. TWC prepared from 2-mm-thick, low-density Poplar infiltrated with epoxy resin exhibits high optical transmittance of around 83% at 550 nm wavelength. The TWC material also exhibits high optical haze of around 85% due to the anisotropic ultrastructure of wood.

While using moderately heavy wood species for instance – such as Melia dubia and Silver oak – the optical transmittance is slightly reduced to 76% and 72% respectively, for 2-mm-thick wood sections (Bisht et al. 2022b).

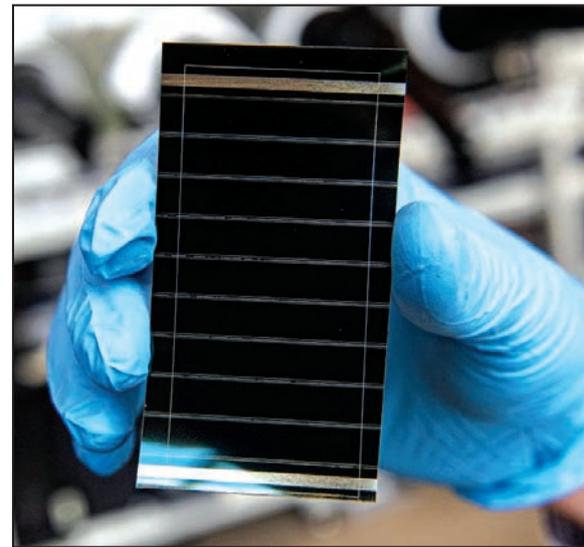
In comparison, a clear epoxy sheet shows a transmittance value of around 91% and almost 0% haze at 550 nm wavelength due to its homogeneous interface.

The optical transmittance of TWC decreases with increasing wood thickness. In thicker sections light needs to travel longer distances and suffers from scattering due to the anisotropy caused by hierarchical wood ultrastructure.

The optical transmittance values for 4.5-mm and 10-mm-thick TWC were found to be 65.5% and 48% respectively at 550 nm (Bisht et al. 2022a). However, efforts are being made to improve the optical properties of thicker sections.

Flexible material

TWC can be made highly flexible and foldable by changing the infiltrating polymer. The infiltration of a water-



TWC holds promising potential in light transmitting and harvesting devices, energy-efficient elements, smart windows and roofs, display panels and solar cells.

soluble dispersion of PVA and polyethylene glycol in the bleached wood substrate results in a flexible TWC with 80% light transmittance (Rao et al. 2019).

Similarly, flexible TWC can be achieved with the use of flexible epoxy resin, polyurethane as the infiltrating polymer. These can be considered flexible devices, photonics, light diffusers, etc.

Wood being a porous material allows easy accommodation of external materials such as nanoparticles, quantum dots, dye, and other functional compounds to produce multi-functional properties. In TWC, the addition of these materials leads to the development of magnetic transparent wood, luminescent transparent wood, photo-chromic/thermo-chromic transparent woods, etc.

For intended outdoor applications, weathering-resistant TWC is needed. Recently, a UV-resistant, photo-stable TWC functionalised with an UV absorber was fabricated which can be effectively used outdoors.



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Reinventing American hardwoods

NEIL SUMMERS



The complex, free-standing structure of 'Endless Stairs', made with American Tulipwood, explored the first use of hardwood CLT.

The wide range of American hardwood species offers the architect and designer a wonderful palette of colours, textures and grains from which to make furniture and design interiors. What they do not offer, however, is a very durable wood species that can be considered for outdoor applications, such as cladding or decking.

Their use in structural applications has been somewhat limited by a lack of knowhow. But this is now changing through the application of new and relatively simple technology, coupled with a readiness to explore timber as a material for a wider range of construction solutions.

The growing outdoor cladding and decking market uses significant volumes of timber, which at present uses very little American hardwoods and, therefore, it provides major scope for growth.

In the hardwood forests of the United States, there are a few naturally-occurring very durable species, such as Black locust, but they are not available in commercial quantities.

American white oak has been used successfully in Europe on some large projects, but allowance has to be made for sapwood and preservative treatment may be necessary.

However, the application of 10,000 square metres of White oak exterior cladding on the EU Veterinary Centre in the harsh climate of Ireland in 2002

shows that this species can be used for this purpose, if handled and installed correctly.

Thermal modification

With an aim to develop new markets, the American Hardwood Export Council (AHEC) realised early on that wood modification was going to play a very significant role. Applying wood modification processes enables a non-durable species to be used externally.

Thermal modification of timber is one such generic process and it is adaptable to a range of different timber species. The modern commercial method of thermal modification was developed in Scandinavia some 30 years ago, enabling the plentiful local softwood resource to be made durable without the application of chemicals.

It soon became apparent that certain temperate American hardwood species could also lend themselves very well to the thermal modification process. The leading species are Ash, Tulipwood, Soft maple, Yellow birch and Red oak. Some lesser-known species such as Hackberry, Sapgum and Basswood also modify very well.

AHEC has used thermally-modified timber (TMT) to showcase its potential for outdoor applications in a number of their design collaborations. The first project was the Infinity Bench designed by Martino Gamper for the 2012 London Design Festival.

In his unique design, he used five different thermally-modified American hardwood species: Tulipwood, Ash, Soft maple, Red oak and Yellow birch. The range of species used allowed for an exciting contrast in colours, grains and textures.



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The world's first building made from hardwood CLT in the UK, Maggie's Oldham is also made from American Tulipwood. A decade of research and development into structural timber innovation could broaden the use of CLT in the construction industry.

Other bench design collaborations in thermally-modified American hardwoods include Emirati designer Khalid Shafar's City's Bench in Dubai, and Australian Ben Percy's design for Sydney Indesign 2013.

An interesting project also using TMT was 'The Cocoon', a collaborative installation between T.Zed Architects and AHEC, which was initially designed for Downtown Design Dubai 2016. It now serves as an observation deck at the Dubai Creek harbour promenade.

Building with wood

In construction, there is no other material that comes anywhere near wood in its potential to offer environmental benefits. Recent developments in construction timber products such as cross-laminated timber (CLT) and glued-laminated (glulam) beams have meant that structural design in timber for buildings has been raised to another level.

There are significant advantages to building in wood too, including lower foundation costs, as timber structures are invariably lighter; and an overall shorter construction time.

Looking back to 2000, Hopkins Architects used American White oak for the Arup-designed grid-shell roof structure over the courtyard of Portcullis House in Westminster.

Initial strength testing showed American White oak to have a

strength class of D50, roughly twice the strength of high-grade softwood. This meant that more slender timber members could be used, allowing for structural performance along with aesthetic design.

The use of White oak in Portcullis House prompted AHEC to test four commercially important species for their strength values, so that these could be incorporated into the European building codes and design standards. White oak, Red oak, Ash and Tulipwood were tested to EN338.

This standard defines a range of strength classes based on values for bending strength, stiffness and density. All of these values were published in AHEC's technical guide, Structural Design in American Hardwoods, which is available on the AHEC website (www.americanhardwood.org).

Interestingly, American tulipwood, although meeting the D40 strength and stiffness requirements, did not have the necessary density in order to permit it to be classified.

AHEC projects

More recently, an engineering marvel made of American White oak features in the redevelopment of the Warner Stand at one of the world's most iconic sporting facilities, Lord's cricket ground in St John's Wood, London.

In this pioneering project, the roof of the stand is formed from 11 cantilevered American White oak glulam beams, manufactured in Germany by specialist timber fabricators, Hess Timber. These radiate dramatically from the corner of the ground, paving the way for brave new structural uses of sustainable American hardwoods.

Each beam measures 900x350 mm at the deepest point. The longest glulam beam weighs approximately 4 tonnes and measures 23.4 metres in length – the same as 26 cricket bats lined up nose to tail.

The new structure is more than an aesthetic success and crowd pleaser. It is the first time the species has been employed in this format on this scale and in such a performance critical environment – forming the primary structure of a roof projecting out over 2,600 spectators.

AHEC's long-standing partnership with the London Design Festival has enabled it to showcase a number of ground-breaking structural collaborations using American hardwoods in iconic London locations.

The first of these was in 2008, with David Adjaye's Sclera pavilion, which used laminated and engineered American Tulipwood. Perhaps even more intricate was the 12.5-metre-high American Red oak 'Timber Wave', erected outside the entrance to the Victoria & Albert Museum in 2011.

Designed by Amanda Levete with Arup, this pushed structural design in timber to its very limits. Here, curved chords made from 7-mm lamellas were glued together to form wavy laminated beams and the whole was held together with a series of cross-ties.

Timber innovation

CLT is quickly becoming established as an important construction material. Made from low-cost softwood, it is essentially a thicker version of plywood that is ideal for making structural wall panels and floor cassettes.

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Warner Stand at Lord's cricket ground is an engineering marvel made of glulam beams from American White oak. It forms the primary structure of a roof projecting out over 2,600 spectators.

So the next structural collaborative project for AHEC at the London Design Festival set out to show that American hardwoods could also be considered as the raw material for structural CLT. The result was the innovative 'Endless Stair', designed by Alex de Rijke of dRMM.

This complex, free-standing structure explored the first use of hardwood CLT, using American Tulipwood in this Escher-inspired series of staircases. While *in situ* the 'Endless Stair' allowed for many fine views over London and the Thames from its location outside the Tate Modern Gallery.

Building on their experience with 'Endless Stair', dRMM designed the world's first building made from hardwood CLT in the UK. Supported by AHEC, the opening of Maggie's Oldham was a pivotal moment for modern architecture and construction.

dRMM chose Tulipwood for the design of Maggie's Oldham for the positive influence wood has on people and for the beauty, strength and warmth inherent to American Tulipwood.

All in all, the project has been constructed from more than 20 panels of five-layer CLT from American Tulipwood, ranging in size from 0.5 metres to 12 metres long, which were developed by CLT specialists, Züblin Timber.

For AHEC, Maggie's Oldham is one of the most important developments in a decade of research and development into structural timber innovation, and one that could broaden the use of CLT in the construction industry.

The creation of this product and significant use of hardwood will hopefully transform the way architects and engineers approach timber construction. In fact, American Tulipwood CLT is around three times stronger and stiffer in 'rolling shear' than its softwood equivalent and its potential in wood construction is extremely promising.

Through AHEC's vision, sustainable American hardwoods are now beginning to enter new and exciting commercial markets. As the world re-embraces timber as a building material, it is hoped that they will become recognised more for the possibilities they can offer in all aspects of design and construction.

For more information on American hardwoods and AHEC's design collaborations, visit: <https://www.americanhardwood.org/en/examples/our-projects>.

The Cocoon' serves as an observation deck at the Dubai Creek harbour promenade.



– The writer is a Technical Consultant with the American Hardwood Export Council. This is the 11th in a series of technical articles that aim to inform the reader of the different properties of wood and how they can affect the behaviour of timber in application. For earlier articles, visit www.woodnews.in.





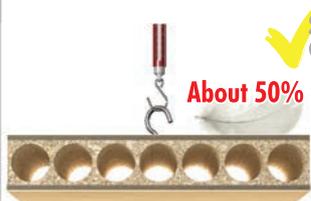
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Melamine-based and other resins

T.K. UNNIKRISHNAN

Melamine formaldehyde resin is the most important and a very highly sophisticated resin among the amino group because melamine, due to its inherent properties, contributes a lot of characteristics such as surface resistance to scratches, wear and tear, water repellence, stain resistance, limited resistance to heat, flame retardant and weather resistance.

This is a water-based resin that is soluble in water as well as methyl alcohol; but it has a short shelf life – at room temperature it lasts about a week. However, this resin in spray-dried powder form has long shelf life under normal room temperature, and an even longer life under lower temperature and humidity.

This is polycondensation and the reaction is a heating-cooling cycle with its endpoint decided on the values of water tolerance, viscosity, specific gravity, gel time, solid content, water content, etc.

Melamine – $C_3N_3(NH_2)_3$ – has a melting point of $354^\circ C$ and is obtained by heating dicyandiamide at 209 degrees C. Di-cyanamide is obtained by heating cyanamide at $80^\circ C$. The recently preferred and universally accepted method is by heating urea in the presence of a catalyst.

Thermo-setting compounds

Melamine and formaldehyde (37w\w) are drawn into a stainless steel reaction kettle in a molecular ratio of 1:2.50. The reaction kettle is fitted with a stirrer, two reflux

condensers, one vertical and a horizontal type.

The kettle may be either a jacketed type or of limpet coil construction. The heating medium used is generally steam (thermic fluid systems are also in use) and cooling is done by cold water.

After charging the reaction kettle with melamine and formaldehyde, caustic soda solution (sodium hydroxide) is used to adjust the pH of the reaction mixture to 9.0 under constant stirring, before heating.

Heating is conducted at a rate of $2^\circ C$ per minute and the temperature is raised to $90^\circ C$. Necessary care should be taken to control the heating as this is an exothermic reaction.

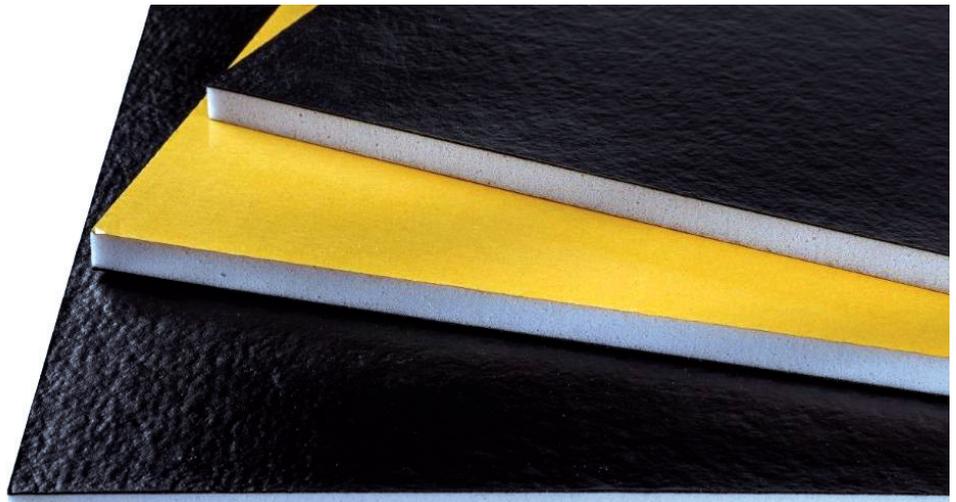
Melamine, when it reacts with formaldehyde, forms resinous thermo-setting compounds similar to the methylol ureas. Ureas, as we know, forms mono- and di-methylol compounds by loss of water between an amino group and formaldehyde reacting as methylene glycol.

This complexity results in better properties compared to urea formaldehyde resins; and that is the reason behind the acceptance of melamine formaldehyde resins, polymers and plastics by the industry.

The use of urea formaldehyde resins in the laminate industry, especially for the manufacture of decorative laminates, has now become an accepted technology due to its cheaper cost when compared to melamine formaldehyde resins.

But the substitution of urea formaldehyde resins will automatically lead to the deterioration of most of the surface properties: resistance to abrasions, scratches and stains. Loss of weather resistance and increased moisture absorption of the laminates can lead to poor bonding.

However, there is one silver lining – an improvement in the fire-retardant properties of the laminates. Urea ($NH_2-CO-NH_2$) has two neutral gases in its structure: nitrogen and carbon dioxide, which drastically reduce the combustion properties of the product.



Urea formaldehyde resins

The term amino-plastics (amino resins) has been used as a general name to describe step reaction polycondensation products of aldehydes such as formaldehyde, and nitrogen compounds such as urea, melamine, guanidine and thio-urea.

Each urea molecule contains four reactive hydrogens but only two are methylolated by formaldehyde under alkaline conditions. Cross-linking of the dimethylol urea occurs under acidic conditions to form infusible urea resins.

The addition of monohydric alcohols such as methanol, n-butanol, etc., yields a more soluble resinous product, with a bulky pendant group that can be used for coatings, and as bonding resins for the manufacture of laminates, plywood, particle board, light, medium and high-density boards, and many such allied products.

The industry follows a double-stage reaction in order to obtain a water-clear resin used for impregnation. After charging the urea and formaldehyde as per the molecular ratios described above, sodium hydroxide solution is added to the mixture under constant stirring to a pH of about 9.0.

This mixture is then heated to about 90°C and maintained at that temperature for nearly 30 minutes. It is then cooled down to a temperature of 65°C and acetic acid is added to achieve a pH of 6.0.

The temperature is raised in a gradual manner to 90°C until a water tolerance of 1-3 is achieved. This mixture is then cooled down to room temperature and brought to a pH of 8.0.

Re-adjusting the pH is of great importance as at a lower pH of around 5-6 the resin will continue to polymerise and thus affect the

shelf life of the resin.

Epoxy resins

The most popular and accepted epoxy resin intermediates are prepared from the reaction of bis-phenol-A and Epichlorhydrin. Liquids are produced when high ratios of epichlorhydrin to bisphenol-A are used. Solids with N values of 10-12 are produced by using a

higher proportion of polyphenols.

These oxyranes may undergo ring-opening polymerisation in the presence of acidic or alkaline catalysts. Polyamides and diethylene triamine are widely used for the production of network polymers at room temperature.

Amides with amine end groups (versamides) obtained from the reaction of diamines and dicarboxylic acids are also used as curing agents for epoxy resins at room temperatures.

The ring-opening reactions take place in the presence of traces of proton donors like water or methyl alcohol. Epoxy resins may also be cured by heating with cyclic anhydrides such as phthalic anhydride, maleic anhydride, etc.

A semi-ester is formed by this reaction of the hydroxyl group in the epoxy resin. The carboxyl group formed can then react with either a hydroxyl group or an oxyrane ring.

Phenoxy resins

This type of resin is not a popular or widely-used resin in the high-pressure laminate industry, but is used in the moulded plastics industry because of its qualities like exceptionally good dimensional stability and resistance to creep.

Under the circumstances, it was decided not to go into the details of this grade of resin. However, developmental work was carried out by some companies in the industry and they have established the manufacturing feasibility of laminates, though having a very limited use in the industry.

The only advantage of phenoxyes over epoxyes is the cost factor; but at the cost and sacrifice of certain properties.

(To be continued)



—The writer is an expert in chemistry in the high-pressure laminates industry, with 55 years' experience. This is an abridged extract from his new book, 'Chemistry & Technology of High Pressure Laminates'. To buy the book, write to ravs6@yahoo.co.in. This is the second part of an article that first appeared in the Sept-Oct 2022 edition of WoodNews.

MELAMINE PROPERTIES

To help you better understand what melamine resin is, first, let's take a quick look at the properties that make it so desirable. Melamine resin, or melamine formaldehyde, is a hard, highly durable, and versatile thermosetting aminoplast known best for its resistance to heat and fire.

INSULATION APPLICATIONS

Melamine resin can even be turned into a foam. This foam is relatively new, having only been used in the last 20 years, but has grown in popularity and use since then. The melamine foam is ideal for insulating buildings with distinctive pore structures that would be difficult to fill otherwise. It's perfect for insulating pipes and ductworks. Other ways melamine foam has been used is as soundproofing for studios, sound stages, and auditoriums.

FLAME-RETARDANT APPLICATIONS

Flame resistance is a common point of discussion for melamine resin. One of the most widespread applications is with plasticware; it keeps heat from warping and melting the plastics, as well as extending durability. It's also used in floors and walls to make them far less flammable and self-extinguishing (to an extent) so they smother fires before the flames can get out of control.

PARTICLE BOARDS

It's not even a large investment to have your home installed with particle boards, as they're often cheaper than traditional plywood or medium-density fiber boards. Particle boards are much lighter and easier to move around; shipping them around and handling the labor is far easier. As an added bonus, particle boards have a very smooth surface, so a bit of lacquering and staining will make them look smooth and flat for a fresh, pleasant look much harder to achieve with plywood.

SUPER-PLASTICIZING

Something else that melamine resin is used for is enhancing concrete. When sulfonated melamine formaldehyde is added to concrete, the melamine creates a super-plasticizer that bolsters the concrete for high resistance.

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African designers try their hand at American Red oak

Seven South African designers created furniture that explores their heritage and the story of South Africa's rich design legacy.



Future Heirlooms, a design collaboration between a South African cooperative, Always Welcome, and the American Hardwood Export Council (AHEC), was on display at the Always Welcome Viewing Rooms in Johannesburg. It has now moved to Cape Town.

A group of seven South African designers from three provinces across the country created a series of works that not only look forward to the future of sustainable design, but also

explore their own heritage and the story of South Africa's rich design legacy.

Created in American Red oak by celebrated hardwood furniture designer manufacturers Houtlander and timber importers BOS Timbers, the seven pieces – by Dokter and Misses, MashT Design Studio, The Urbanative, Kumsuka, Kalki Ceramics, and Joe Paine in partnership with Nathan Gates, and Nøde Studio – are a celebration of material and memory.

Under the mentorship of the Always Welcome leadership team, the designers were asked to create an object or a piece

(Bottom Left) The Ukhamba Table by Kumsuka founder Siyanda Mazibuko takes inspiration from Zulu Ukhamba drinking vessels, that are shared between friends and family at Zulu gatherings. (R) Thabisa Mjo, founder of MashT Design Studio, looked to Umbhaco materials and garments, the traditional dress worn by the Xhosa people of South Africa, for inspiration. Her hand-carved table reveals the Umbhaco hidden within the wood.



of furniture that fully encapsulates the themes of sustainability, longevity and quality.

"We need to end our current throwaway culture and need to use materials that have a low environmental impact. Designers, especially, have a huge influence on how products are planned and with what materials," said Roderick Wiles, AHEC Regional Director.

Creative process

For the designers, the project has offered a unique opportunity to explore alternative manufacturing methods, and the beauty and versatility of American Red oak itself.

Thabisa Mjo, founder of award-winning Johannesburg-based product and furniture design group, MashT Design Studio, said, "The material intrigued me from the outset. Coupled with Houtlander's special ability to work with timber, my imagination set alight and I just had to see what could be made."

According to Garreth van Niekerk, Director

and Co-founder of the Always Welcome collective, "This project inspires important discussions around sustainability in South African furniture design, and that the personal narratives of each designer imbued in each piece brings joy and delight to visitors of the show during its run."

Environmental impact

Another incredibly important facet of working with American Red oak for Future Heirlooms, is that the lumber for the project arrived at the South African port of Durban carbon-negative. This means that there was more CO₂-equivalent sequestered inside the delivered lumber than that which was emitted during all the processes of extraction from the forest, saw-milling, kiln-drying and even shipping!

Just about 1.3 cubic metres of American Red oak was used to make all seven pieces, with the finished pieces being made of less than 1 cubic metre of wood after manufacturing. For their lifetime, these seven furniture pieces will keep

around 1,069 kg of CO₂-equivalent out of the atmosphere.

Such is the size of the US hardwood forest resource and dominant in the forest is Red oak, at roughly 18% of the total resource. All the Red oak lumber used to make the seven designs would have been replaced in the US hardwood forest through natural regeneration in just 1.35 seconds.

"Through this collaboration, we hope the designers and manufacturers learned a lot about this beautiful and sustainable material while also demonstrating the beauty of widely-available, yet under-utilised American hardwood species," concluded Wiles.

(L) First-time parents Katy Taplin and Adriaan Hugo, co-founders of Dokter and Misses, celebrated the next phase of their lives with a design that brings a Family Portrait into their line of product and furniture design. (R) Designed to resemble the braids and coiffures worn by ethnic Fula people in the Sahel and West Africa, The Fulani Chair by designer Mpho Vackier's The Urbanative uses charred American Red oak with a water-based sealer.



Jaipur café uses Yellow cedar for interiors



Interior designers and architects in India have begun to include softwood species in their designs in an effort to modernise appearances. Yellow cedar, a softwood species from British Columbia (Canada), was recently used in the interior finishing of a coffee shop project in Jaipur.

A technical collaboration between FII India (better known as Canadian Wood) and The Town Coffee Gourmet Espresso Bar in Jaipur (Rajasthan) enabled the project to feature Yellow cedar in furniture, window frames, panelling, doors, and door frames, among other

interior applications.

Mr. Rajeev Singh, the designer for the project, has a passion for hospitality and was aware that the interior design of the retail establishment would be essential for a holistic client experience. Town Coffee Gourmet Espresso Bar is his first project, which is a testament to his expertise in retail design.

It makes sense that his first location was a major draw for young people looking for a place to hang out and unwind at Jaipur's first themed coffee shop.

Client experience

It is important for a retail establishment to provide a positive client experience in

the current era of "experiential purchase". The interior layout of a retail establishment can have a big impact on how customers behave and feel. It is an elusive yet very important prerequisite.

While developing the project, Rajeev was hunting for wood with a light, smooth finish that would go well with the shop's dark interior walls. When he went to the showroom of the nearby stockist, Tambi Timbers, FII India gave him a technical rundown of the available goods and showed him a selection of B.C. species.

FII was consulted before finally deciding on Yellow cedar for the project because of its strength and aesthetic qualities. The project had a very successful outcome:



Park Hospitality was happy with the aesthetic and performance of the project.

More in use

Nowadays, sustainable materials are preferred for projects by architects, designers and clients alike. This fact fits nicely with the use of Canadian wood species for a variety of purposes.

Designers and woodworking professionals find it to be the best option because of its additional benefits – such as being seasoned, certified and ready for use.

The use of Yellow cedar in Town Coffee Gourmet Espresso Bar serves as an excellent showcase for British Columbian wood species, and it has proven to forge significant relationships with local

developers keen to use Canadian Wood species and expertise in upcoming projects.

Rajeev, the designer, is keen on using Canadian wood species again for his projects because it has already been tried and tested. He is pleased with the results and already working on many other restaurants. It stimulates him to come up with fresher concepts.



Experts debate carbon markets for tropical forests



Markets for forest carbon are growing fast and have huge potential, but low carbon prices and other challenges are restraining their capacity to benefit tropical forests and their stakeholders.

This was a key message emerging from the Annual Market Discussion, which was held on 8th November 2022 as part of the 58th session of the International Tropical Timber Council in

Yokohama (Japan) recently.

The Annual Market Discussion is traditionally convened as part of a joint session of the Council's committees as a means for informing Council members of key trends and issues in the tropical timber trade and increasing understanding among governments, traders and other stakeholders.

This year's discussion featured five speakers, as well as interventions from the floor, on the theme of the carbon

trade and tropical forests. It was chaired by Trade Advisory Group co-coordinator Mr Barney Chan.

What's 'green-washing'?

Ms Celina (Kin Yii) Yong, from the United Nations Development Programme, said that there had been a huge increase in transactions in the voluntary carbon markets, partly as a result of clarification on Article 6 of the Paris Agreement on climate change at the 26th Conference of the Parties to the United Nations

Framework Convention on Climate Change.

"Voluntary carbon markets will play a key role in the transition process, but there is a risk of 'green-washing'", she said.

There is a growing demand for high-integrity forest carbon credits, but carbon prices are yet to reflect the true costs of maintaining natural forests and high-integrity markets.

"Among other things, high-integrity carbon markets are those that avoid the double-counting of carbon credits, ensure that emission reductions are real, thus avoiding 'green-washing'," she added.

Dr Ivan Tomaselli, from STCP in Brazil, explored the development of carbon markets in Latin America. There is a growing interest in carbon markets across economic sectors in the region and in transactions between countries aimed at emission reductions and achieving net zero emissions.

"Argentina, Chile, Colombia and Mexico are the front-runners in compliance with carbon pricing instruments, and Brazil is pursuing mainly voluntary carbon projects in forests managed for timber production," he said.

Ivan estimated the potential annual value of carbon credits in existing managed forest areas for timber production in Latin

America at around US\$2 billion per year, but this will grow if prices increase with increasing demand.

Africa progresses

Mr Pierre Schueller, from TERE in France, said that there is a growing interest among companies operating in the Congo Basin in forest carbon trading, but only a few players are well informed about the mechanisms involved, and the rules and criteria for engaging in carbon trade.

He said that REDD+ has attracted significant funding opportunities in many African countries, and examples are emerging of forest carbon project initiatives.

In 2021, for example, Gabon became the first country in Africa to receive results-based payments for reduced emissions from deforestation and forest degradation.

Mr Schueller said that the main challenge for expanding forest carbon projects in Africa is removing the technical barriers for such projects and determining ownership of the resulting carbon credits.

"There is a role for international organisations such as the International Tropical Timber Organisation in increasing understanding and technical capacity in Africa," he said.

Mr William Lactayo, from Peru, described new research in Peru using machine learning and light detection and ranging (Lidar), combined with high spatial and temporal resolution satellite imagery, to estimate above-ground carbon at the scale of single hectares.

Carbon stocks

Mr Lactayo said that a strategic and cost-effective combination of Lidar sampling, tactically placed field calibration plots, satellite data and geo-statistical modelling approach showed it was feasible to obtain a high-resolution inventory of above-ground carbon stocks, even in such a large and environmentally complex country such as Peru.

This theme was also explored by Mr Nicholas Butcher from CarbonCrop in New Zealand, who reported on integrated solutions using artificial intelligence, remote sensing and automation to monitor changes in forest carbon stock in New Zealand.

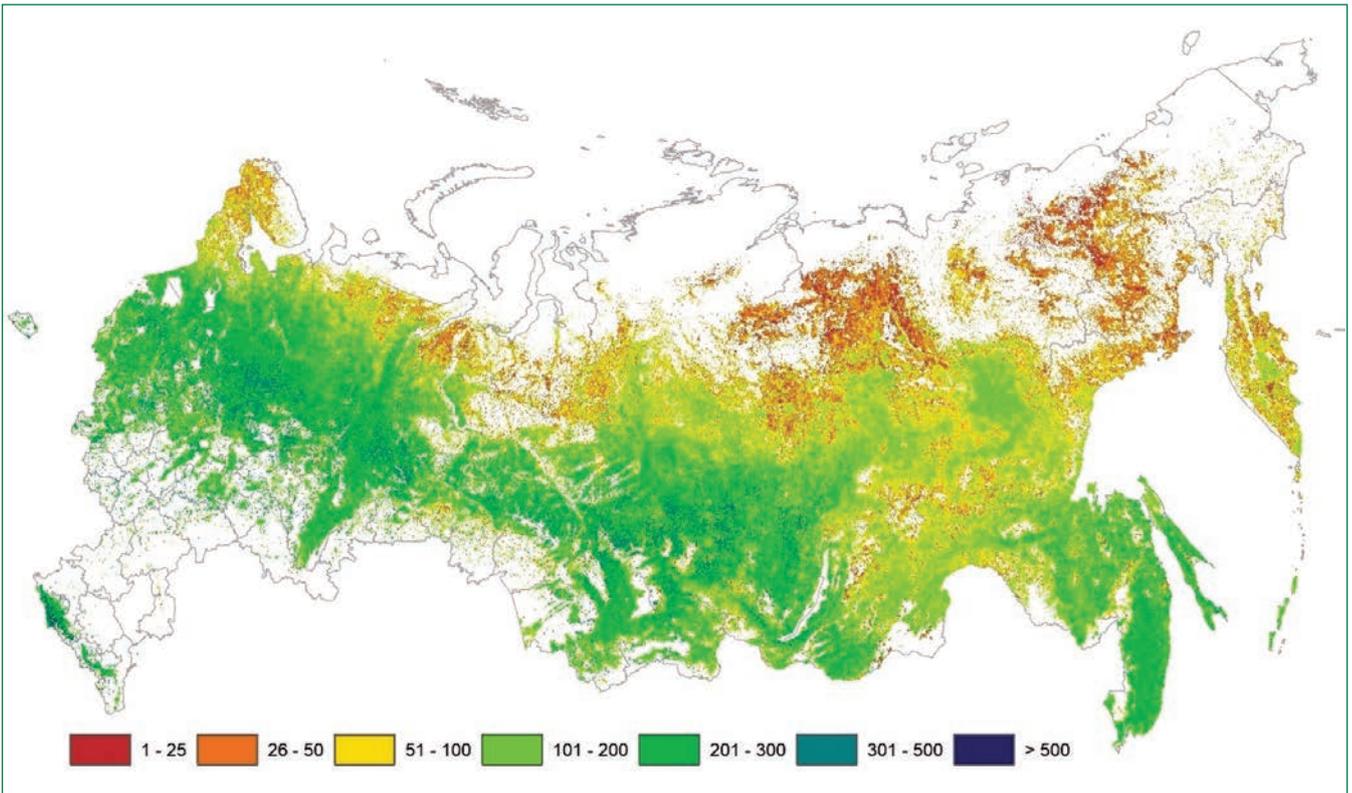
He said that, to be credible, such solutions require integrity, transparency, traceability and auditability. The application of the technology in New Zealand has led to the registration of an additional 30,000 hectares of bio-diverse forest and delivered NZ\$30 million in carbon credits for landholders.

The presentations were followed by a wide-ranging exchange of views between delegates and speakers, including on the potential of forest carbon to generate significant revenues for forests through voluntary carbon markets and compliance mechanisms as means for increasing the financial viability of sustainable forest management.



Ukraine conflict affects timber markets

(Courtesy: <https://www.woodprices.com/>)



One immediate impact of the war in Ukraine and the sanctions by Western countries has been a dramatic reduction in exports of forest products from Russia, Belarus and Ukraine.

In the year 2021, the total exports from these three countries were valued collectively at US\$ 17 billion.

In addition to the sanctions, the Russian forest industry will struggle to source parts, equipment and finance, which will force even non-sanctioning countries, such as China, to adapt to changes in trade flows.

Wood Resource International's new focus report, 'Ukrainian War

Fallout: Disruptions in Global Trade of Forest Products', investigates the short-term and potential long-term implications of the war and its impact on worldwide shipments of timber, panels, wood pellets, logs, wood chips, pulp and paper products.

Softwood timber accounted for almost half of the export value for Belarus, Russia and Ukraine in 2021. The disruption in trade has significantly impacted global markets because the three countries accounted for nearly 25% of worldwide lumber shipments last year.

The halt in timber shipments to Europe and some countries in Asia has had the most significant impact.

'Conflict timber'

Still, trade with non-sanctioning countries

is also likely to change as Russian and Belarusian companies struggle to make financial transactions and secure credit.

There is a likely change in the designation of their forest products status from being certified (ensures products come from responsibly managed forests) to "conflict timber".

The label "conflict timber" limits exports of Russian timber to furniture manufacturers in China, which export certified product to Europe and North America.

In addition, Russian sawmills, which in the past have shipped timber to customers in Europe, cannot quickly shift to other markets in the short term.

For example, sending timber by ship or

rail from sawmills in north-western Russia to China meets logistical challenges, and the Middle East/North Africa (MENA) region, which is a lower-grade wood market, is currently not in a robust expansion mode.

Belarus, Russia and Ukraine exported 8.5 million cubic metres of softwood timber to Europe in 2021, almost 10% of the continent's total demand.

In the short-term, European sawmills could redirect overseas shipments to the European market if financially expedient to mitigate the lost supply from the three countries.

In the longer term, some lumber-producing companies may consider investing in new production capacities, although log supply in many regions of Europe is becoming tighter.

In addition, the major overseas markets (China, US, Japan and the MENA region) are diverse in product demand, price acceptance, exchange rate volatility, political stability, and consumption outlook.

These varied market conditions could result in European exporters limiting their overseas exposure to fewer markets that fit their product mix and risk tolerance.

This development would mainly affect China, which relies on the import of forest products, including logs, wood chips, lumber, pulp and paper from North America, Europe, Oceania and Latin America for domestic use.

These world regions are considering expanded sanctions for Russia and countries that directly or indirectly support Russia's attack on Ukraine.

Russia's role

Russia exported forest products that were valued at over US\$ 12 billion in 2021, and imports of paper products (mainly) are valued at about US\$ 2 billion, according to Wood Resource Quarterly. Much of this trade is in jeopardy.

Russia is the largest timber exporter globally and ranks as the seventh-biggest exporter of forest products worldwide. It has vastly underutilised forest resources and has the potential to increase timber harvests to supply its domestic industry.

To meet increased global demand for forest products, the Russian government recently initiated programmes to encourage investments in the sector to both expand and modernise existing manufacturing plants and build green-field facilities.

However, it is likely that many investment projects in the forest products manufacturing sector in Russia will grind to a halt as the growing list of sanctions and financial transaction restrictions take effect.



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Jai Industries offer an unparalleled array of products that include woodworking and panel processing machinery and electric motors. It is well known for its engineering quality, technology and innovation.

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This is a sturdily built heavy-duty Pro Panel Saw is specifically built to suit

Indian working conditions for precise cut with burr free cutting.

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- Rip fence with fine setting for precise positioning.
- Made in India with best service support & very economical spares.



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Smartech to revolutionise wood panel manufacturing



Siempelkamp, a leading technology provider of machinery and equipment for the wood-based panels industry, has signed a partnership with the pioneering Israeli hi-tech company, Smartech.

The agreement calls for a technology and commercial collaboration to bring breakthrough autonomous

process control to engineered wood-based panel manufacturing plants.

The two parties will jointly offer the closed-loop Prod-IQ SmartPress solution for engineered wood panel presses. The software utilizes artificial intelligence, machine learning algorithms and real-time data to directly increase press throughput and quality while lowering manufacturing costs.

The Prod-IQ SmartPress architecture

aggregates real-time production parameters along with contextual input from various press operators, and then generates a new operational base-line for higher performance levels across the mill's shifts.

Autonomous process decision-making has conventionally resided with the machinery operator; this now shifts autonomous decision-making to the plant itself.

Siempelkamp and Smartech have already validated the unprecedented capabilities of Prod-IQ SmartPress on a full-scale wood panel production line with a leading global engineered wood panels manufacturer.

Maximising WBP quality through service

The specifications of a steel press belt – its thickness deviation, flatness and straightness – have an obvious and direct impact on the quality of boards that emerge from the press, from the day the belt is installed all the way through to end of its life.

Swedish belt manufacturer IPCO employs a combination of high quality raw materials, precision manufacturing technologies and stringent quality checks to ensure that every press belt that leaves its factory is ready to produce board material of the highest quality.



But production is only the first part of the company's service. Belt damage is an unavoidable fact of life in the WBP (wood-based panel) environment, and repairs have to be both quick and effective in order to minimise costly downtime and ensure that board quality is maintained.

To ensure that this is the case, IPCO has invested heavily in a service infrastructure that combines the on-the-ground expertise and market understanding of a locally-based team with the dedicated skills and expertise of the company's press belt experts.

The company's Southeast Asia sales and service office is based in Pune and is geared up to deliver a rapid response to all service requirements. Fully trained and equipped with specialised service and repair tools, IPCO's service teams carry out installations, belt checks and repair work for WBP manufacturers throughout India and beyond.

For issues where more specialised expertise is required, IPCO India can call upon the support of a global service team, IPCO's Press Priority Team, a group of trouble-shooting press belt experts who can be assigned to support customers anywhere in the world at short notice.

Any deterioration in product quality – or worse, unplanned press downtime – can be extremely costly, so a growing number of IPCO's customers are choosing to take advantage of preventative maintenance agreements.

This means that an IPCO engineer will visit at predetermined intervals to undertake a detailed, in-operation inspection of the press belt covering everything from joints, edges and surfaces to the condition of sheaves, rollers, sensors and tracking systems.

The agreements can be tailored to a customer's specific needs and can also take in standstill checks and flatness assurance assessments.

If any issues are identified, the necessary remedial steps can be taken. For example, if belt flatness is a cause for concern, IPCO can rectify this using the Shotpeener Pro tool, a portable device that is used to remove deformations caused by the stresses placed on the belt in high-speed thin-board production.

The Shotpeener Pro is just one of a number of high performance tools available to IPCO's service teams, all designed to carry out installation, maintenance and repairs to the highest possible standard.

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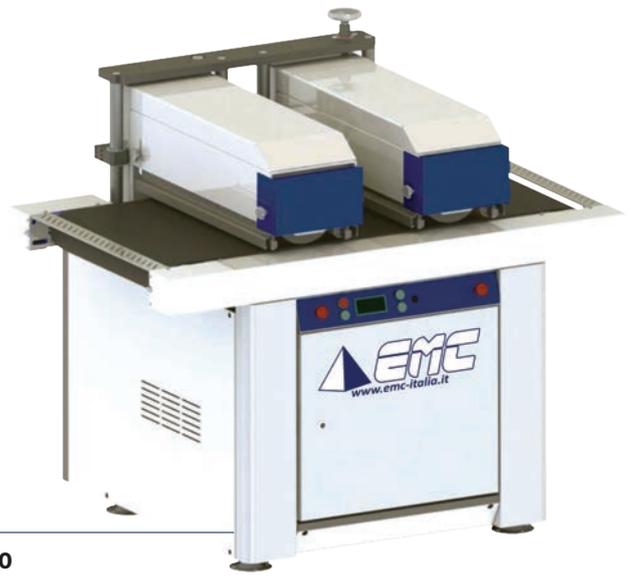


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EMC wood finishing now in India



Rustica 650

The Mercury 650-1100-1350 is perfect for calibration and sanding of solid wood, plywood, MDF and particle boards, and fine sanding for veneer, base coat, solid wood and melamine. The machine version is with 2/3/4 aggregates, with a useful working width of 650/ 1100/ 1350 mm.

The working thickness of the machine (min/max) is 3/170 mm with automatic thickness positioner. The sizes of abrasive belts are 1900/ 2200/ 2620 mm.

The aggregates which can be configured in this model are planer, contact roller, segmented sanding pad, super finish sanding, combination and cross-sanding aggregate.

The segmented pad consists of 25 segments as well as 50 segments. It has inverter for feed belt, with a roller table extension; compact belt blowers and turbo rotating blowers; and brush aggregate for panel and feed belt cleaning.

The operation of the machine is controlled by digital control panel.

The Rustica 650 is employed in solid wood industries to get a grain-like structure and tynex structure on solid wood. This machine version is with two brush 2BB aggregates consisting of steel and tynex brushes, with a useful working width of 650mm.

The brushes are with a diameter of 200mm; counter and the machine has a display for passes, as well as an inverter for feeding aggregate.

The Woody 1100 is used for calibration and sanding of plywood, MDF and particle boards. The machine comes with a 1/2 abrasive belts with a useful working width of 1100 mm.

The working thickness of the machine (min/max) is 3 /170 mm, and the size of the abrasive belt is 1900 mm.

The two working aggregates are configured into 2RK (contact roller and combi aggregate) with independent motors, which includes electro-pneumatic segmented sanding pad of new conception with 25 segments.

The machine comes with an inverter for feed belt, with a roller table extension; compact belt blowers and cleaning aggregates; and flexible removal of sanding pads and interchangeable.

The operation of the machine can be controlled by analog control panel or by digital control panel.

EMC-Italia is represented in India by Bengaluru-based Arnavi Machines. For more information, write to ns@arnavimachines.com.



Mercury 1100

EMC-Italia, the machinery manufacturing company specialising in wood processing and metal finishing, is offering three solutions for the Indian woodworking industry.



Woody 1100



Association of Furniture Manufacturers & Traders (INDIA)



BENEFITS OF BEING A MEMBER



Directory

AFMT Directory will be an effective tool to project profiles of our members before related industries, other business houses, developers, design community, embassies and trade commissions. It will also help members to locate other manufacturers, traders and importers for sound business growth.



Furniture & Furnishings Fairs

As exhibitions are a one point B2B platform, this should be affordable for every member. The association liaisons with various event organizers to get preferential rates for members of the Association at fairs and exhibitions.



Educational & Trade Trips

The association on behalf of all its members organises professional and educational trade trips to different parts of the world.



International Recognition

AFMT is a single body to interact with foreign companies and other International trade organisations who wish to know about our industry. Effective technology and information transfer through collaborations & joint ventures.



Fair Taxation Policies

AFMT as an entity would approach the Government to demand a non biased taxation policy. To collectively voice concerns of the Furniture Industry to the Government bodies.



WhatsApp Business Group

AFMT offers a platform where members can exchange information about their products and do business.



Trainings, Seminars & Webinars

AFMT as an entity would approach the Government to demand a non biased taxation policy. To collectively voice concerns of the Furniture Industry to the Government bodies.



Newsletter

The most effective way of reaching out to people from our industry. It will be designed to keep the Furniture Industry informed of the latest developments in the business. It will carry information on the activities of the association, its partners and members.

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OBITUARY

HPL expert, Unnikrishnan, no more



Mr T.K. Unnikrishnan, consultant and expert in the laminate and plywood industry in India, passed away recently at his home in Kerala. He was 81 years old.

Born and brought up in Vellinezhi (Palakkad district),

he completed his higher education at St Thomas College, Trichur, where he got exposure to organic chemistry.

After a brief stint in the automobile industry, Unnikrishnan started his journey in the high pressure laminates (HPL) manufacturing industry with Formica India.

He spent nearly 55 years in various capacities with many reputed organisations in the laminate and plywood industry. Later, he was also a consultant to many HPL projects across the country.

Utilising his extensive knowledge about HPL, he authored a book, 'Chemistry & Technology of High Pressure Laminates', in 2021. Abridged versions of this book are being serialised in *WoodNews* (including this edition) for the benefit of the HPL and plywood industry.

Relief for Shisham furniture exports

Shisham (*Dalbergia sissoo*) is a banned item as per CITES regulations for the trade of the species. As of now every consignment above 10 kg requires a CITES permit. Due to this restriction, exports of furniture and handicrafts made from Shisham, India have been continuously falling and has affected the livelihoods of around 50,000 artisans who work with the species.

At the 19th meeting of the Conference of Parties to Convention on International Trade in Endangered Species of wild fauna and flora (CITES) India's initiative to clarify the quantity of Shisham items such as furniture and artefacts was considered.

After sustained deliberations, it was agreed that any number of Shisham-based items can be exported as a single consignment in a shipment without CITES permits, if the weight of each item of this consignment is less than 10 kg. It was also agreed that for net weight of each item only timber will be considered. – *Courtesy: Ministry of Environment, Forest and Climate Change*

Homag launches maintenance app

for our customers looking to improve machine maintenance and communication by enabling real-time status updates.

With this app, customers can connect with the company for service or sales or training or any other requirements; users can check their machine details online; create service requests anytime, anywhere; track the status of the service request; make an online payment to purchase spare parts swiftly; and improve business continuity.

Requests for quote/purchase and annual maintenance contracts can be made online, any time; check invoice details online; assign/change the machine operator's contacts for better coordination; and share feedback online. The app will thus provide Homag's customers with an effortless, proactive after-sales service experience and enable efficient servicing of all machines.

In an effort to deliver a good post-sales experience, Homag India has launched an all-new Service Assist app, which is an easier way to monitor, measure, and manage Homag machine maintenance activities. This is the ideal solution

Kesseböhmer opens experience centre in Pune

Kesseböhmer GmbH recently inaugurated its first Experience Centre in India. Spread over a carpet area of 3,000 square feet, it is a must-visit contemporary design centre for those who wish to experience state-of-the-art modular wardrobes and kitchen accessories.

The Pune Experience Centre is a place where Kesseböhmer's products are displayed. With this, customers will soon experience a much-enhanced range of products at various price points with Clever Storage as its central theme.

The new showroom will enable customers to engage more deeply with the products and provide customers with an instant



sense of how products might seem in their homes.

Through its innovative ideas and effective blending of style, function, and high-quality products, the company aims to address all the storage challenges that every Indian kitchen user as well as maker faces today.

Sherwin-Williams to acquire ICA wood coatings

The Sherwin-Williams Co. announced it will acquire Industria Chimica Adriatica SpA (ICA), an Italian designer, manufacturer and distributor of industrial wood coatings used for kitchen cabinets, furniture and décor, building

products, flooring and other specialty applications.

The transaction is expected to close by the end of 2022 following customary regulatory approvals, and ICA will become part of Sherwin-Williams' performance coatings group operating segment.

ICA brings with it innovative waterborne and solvent liquid coatings technology, including an award-winning range of ultra-matt protective coatings and a growing portfolio of bio water-based coatings products, which are made with recycled raw materials.

ICA has annual sales of more than €150 million and has an interest in the India-based joint venture, ICA Pidilite.



Indian architects endorse Canadian wood projects

Canadian Wood recently hosted a seminar at its Experience Centre in Mumbai, on 'Re-man projects with Canadian Wood'. At the event, prominent architects – Salil Ranadive of SR+A Architects, Pravir Sethi of Studio Hinge, and Vinoo Naik of Interscape – endorsed the wood as a sustainable material.

The Canadian Wood campaign, which promotes using legally manufactured, responsibly harvested wood from British Columbia,

Canada, has resumed after a 2-year suspension brought on by the Covid-19 pandemic. This includes seminars and other activities that were previously halted.

Canadian Wood promotes its wood products in offshore markets, focusing on Spruce-Pine-Fir (SPF), Western hemlock, Douglas-fir, Yellow cedar and Western red cedar.

United Surface Solutions ties up with Unilin for new solutions

United Surface Solutions and Unilin Technologies recently announced their license cooperation regarding digital printing and texturing technologies, which allows United Surface Solutions to utilise the broadest patent portfolio in the digital printing space today.

The tie-up will use advanced digital printing and texturing machines from Barberan, headquartered in Spain, and consumables developed by the Italian company ZeeTree.

The solution has been specifically engineered for allowing ultra-high resolution printing direct to board, wear layer advancements to deliver class AC5 scratch resistance, and state-of-the-art digital embossed textures and durability never seen before on SPC products.

The current installation and development timeline intends to have the products available for sale starting in December with EIR Digital Embossing available in early Q2.

Mallika Sinha heads PR at IKEA



Mallika Sinha recently announced her move to a new position as the Public Relations Leader (India) at IKEA. Mallika is an experienced senior marketing communications manager with a demonstrated history of working in the health, wellness and fitness industry. She is also skilled in crisis communications, digital marketing, customer journey, media relations, corporate communications, market research and management.

Sinha has previously worked in organisations such as L'Occitane en Provence, Oriflame India Pvt Ltd, Vitcom Consulting Pvt. Ltd. and IPAN, according to exchange4media.com.

Dieffenbacher and 19 organisations from seven countries have joined forces in the EcoReFibre (Ecological solutions for recovery of secondary materials from post-consumer fibreboards) research project to make the production of wood fiberboards, such as MDF and HDF (medium-density and high-density fiberboards), more sustainable.

The project aims to recycle wood fibers at the end of their life cycle and use them to produce new fiberboard. Currently, fresh wood is used almost exclusively to produce wood fiberboard.



The four-year project, which kicked off in May 2022, has 12 million Euros in funding from the European Union through its research and innovation funding programme, Horizon Europe.

The project partners, who include wood-based panel manufacturers Homanit and Sonae Arauco, intend to develop and test solutions that will enable up to 25% of the fresh wood fibers used to manufacture wood fiberboards to be replaced by recycled secondary fibers.

Five pilot projects will also explore how recycled wood fibers can be used to manufacture new end products such as insulation materials and bio-composites.

Dieffenbacher collaborates on recycling project

Altendorf bags 'Innovator of the Year' award



Altendorf GmbH was awarded 'Innovator of the Year 2022' for its unique Hand

Guard safety assistance system for sliding table premium saws. The prestigious

business award was presented, appropriately enough, by Dr Hermann Simon, author of the standard work first published in 2007, 'Hidden Champions of the 21st Century'.

In Germany alone, an average of 120 accidents per month occur in connection with sliding table saws. Altendorf employed artificial intelligence to design the optical Hand Guard system. It is the world's first and only certified safety assistance system for sliding table saws in the industry.

Altendorf's Hand Guard is the only safety assistance system for sliding table saws to have been awarded the Tested Safety Seal by the German Employers' Liability Insurance Association for Wood and Metal (BGHM) and is the only system with a safety function that can process all materials such as wood, wet wood, aluminium and plastic without any problems.

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HIFF concludes with success



India's largest B2B finished furniture fair, the Hindustan International Furniture Fair (HIFF), was successfully held at Codissia Convention Centre in Coimbatore. During the 4th edition, there were more than 650 stalls and around 14,000 attendees from different parts of the country.

HIFF was formed in 2016 to strengthen, promote, and create a solid foundation to propel the Indian furniture industry internationally through cross-border exposure, training, and collaborations and is recognised as the most appropriate platform for learning about and exploring the latest trends in the world furniture industry.

It also provides the perfect platform for creating and establishing new business contacts. As a result of the fair, furniture producers were able to exhibit their products more effectively. The next edition of the trade show will be held in Coimbatore in September 2023.

Ligna to take place in May 2023

Ligna, the world's leading woodworking machinery fair, is scheduled for May 2023 in Hannover, Germany. To give an impetus for industrial development, it has decided on 'Woodworking Transformation',

'Prefab Building Processes' and 'Green Material Processing' as the focus topics of the upcoming event.

Seven display categories at Ligna will include tools and machinery for custom and mass production; surface

technology; wood-based panel production; sawmill technology; energy from wood; machine components and automation technology; and machinery for forestry, round wood and sawn timber production.

Rushil Décor sets up MDF plant in Andhra Pradesh

Rushil Décor, a global leader in smarter living solutions, has expanded its global operations with the setting up of a first-of-its-kind, world-class, state-of-the-art, agroforestry based, sustainable, environment-friendly future boards (medium density fiberboard or MDF) making plant in Achutapuram, Andhra Pradesh.

Driven by smart manufacturing, and fully-automated robotic production, the technologically advanced plant is strategically located close to raw material sourcing agroforestry-plantations, creating sustainable livelihood, reducing the transportation impact, and lower emissions.

The investment in the fully-integrated plant is significant and amounts to over

Rs. 500 crore. This automated plant with an annual full capacity of about 2,40,000 cubic metres is amongst the largest, most sophisticated, safest and smartest manufacturing plants in the world.

With the help of this plant, Rushil Décor has the potential to generate revenue of Rs. 1,000 crore topline in the MDF segment on full capacity utilisation.

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