

# MORE

www.egger.com

MORE FROM WOOD.



The EGGER Group Customer Magazine  
04



## Almost Perfect

Humankind found the world's blackest shade of black on the wings of a butterfly. And made it even blacker. Because there is always room for improvement.

## CONTENTS

03 Editorial

### 10 E\_INSPIRATION

11 Ideas for Tomorrow

12 Focus: Perfection  
More than Immaculate

18 Improvement Makes Perfect:  
Sticklers for Detail in Glue  
Production

19 Attention to Detail:  
Decor Design at EGGER

20 Perfection Seen & Unseen:  
A Conversation with Quality  
Expert Roland Jochem

24 5 Things About Resin

### 26 E\_SOLUTIONS

27 The EGGER Team

28 Friends of Wood: The Latest  
Architectural Trends

34 The Russian Scheme of Things:  
The EGGER Plant in Gagarin

### 40 E\_NATURE

41 Living Sustainably

42 A Conversation with ...  
Alfred Teischinger

46 Reinventing the Wheel:  
Wooden Bikes on a Roll

50 Tree-Huggers' Corner:  
Picture Puzzle

51 Imprint





FOR EVEN BETTER SURFACES

In December 2013, EGGER put into service a Siempelkamp short-cycle press line at its headquarters in St. Johann (AT). It's the first of its kind to be used anywhere in the world. The short-cycle press for compact boards is designed for specialised products. It produces deep structures and meets all the high technical demands of manufacturing two-sided synchronised pore boards, allowing the surface relief to exactly follow the colour patterns of the wood reproduced in the decor.

_Publisher	FRITZ EGGER GmbH & Co. OG
	Holzwerkstoffe
	Weiberndorf 20
	6380 St. Johann in Tirol
	Österreich
_Publisher	T +43 50 600-0
	F +43 50 600-10111
	info-sjo@egger.com
Project Management	Michaela Holzmann (V.i.S.d.P.)
_Concept / Design	PLAYFRAME GmbH
	Agentur für Markenkommunikation
	www.playframe.de
Creative Director	Volker Pook
Art Director	Vicky Tiegelkamp
_Editing / Design / Production	Raufeld Medien GmbH
	www.raufeld.de
Editor-in-Chief	Till Schröder
Art Director	Daniel Krüger
_Pictures	Chungking/Fotolia (Titel, p. 13), EGGER (Klapper, p. 3, 6, 18, 19, 27, 34, 38), Rudi
	Schneeberger/Viewcopter (p. 4), Joao Morgado (p. 8), Fraunhofer WKI (p. 11),
	Vij5 (p. 11), Angelo Silviu Roventa (p. 11), John Horstman/Flickr (p. 13), Andrew
	Eccles (p. 14), Lumieres/Fotolia (p. 15), Blue Jean Images RF/Getty Images (p. 16),
	Characterdesign/Getty Images (p. 16), Moodboard/Corbis (p. 16), Angela Salvo
	(p. 20), Photoshot (p. 21), Wiesmann (p. 22), Miele (p. 22), Zoonar RF/Getty
	Images (p. 24), Getty Images (p. 24, 25), Anetlanda/Getty Images (p. 25), Lischer
	und Partner (p. 28), Didier Boy de la Tour (p. 29), Christophe Camus (p. 30), Jens
	Brückner/Hirner und Thiel Architekten (p. 30), Walter Wehner (p. 31), Bernadette
	Grimmenstein (p. 32), Stefan Müller-Naumann (p. 32), Sigurd Steinprinz (p. 33),
_Printing	Patrick Schmidt/EGGER (p. 34), Till Schröder/Raufeld Medien (p. 35 – 39), Firma
	Roggemann (p. 41), Fovea (p. 41), Michael Hagmann (p. 41), Michael Rhonheimer
	(p. 41), Karin Wasner (p. 42 – 45), Basten Leijh (p. 46 – 47), Erik Boschman (p. 47),
	Brad Quartuccio/Urban Velo (p. 48), Christian Rokosch (p. 49), Harry Schnitger
	(p. 50), photo editor: Gerd Metzner
_Date of Publication	Friedrich VDV Vereinigte Druckereien- und
	Verlagsgesellschaft, Linz
	www.friedrichvdv.com
_Comments	March 2014
	Please send your suggestions and comments to <b>MORE@egger.com</b>



# PERFECTION IS A DRIVING FORCE BUT USUALLY REMAINS ELUSIVE. BECAUSE THERE IS ALWAYS ROOM FOR IMPROVEMENT.



The popular Google experiment can tell us a lot about what people connect with a certain word. For example, the search word “perfection” yields a considerable amount of entries related to technical, sporting or cultural excellence; pursuits through which human beings express their emotions. It’s about the pleasure and fascination of aiming for the best possible result and stretching one’s own limits.

Many managers still like to use the working term “quality” and associate it with values such as “error-free” and “efficient use of resources”. Yet controlling complex processes to get the most out of the available resources is a fine art – the art of making a product that surpasses the customer’s expectations of quality.

There is an art in making manufacturing processes sustainable, whilst at the same time taking

social responsibility seriously and striving for fair partnerships in a company’s value creation networks. Perfection is a driving force but usually remains elusive. Because there is always room for improvement.

That is why human beings and the pleasure they derive from achieving the best possible result are at the centre of any modern quality structure. Each and every one of our **7,200** employees deserves our gratitude and acknowledgement for the high quality of EGGER’s products.

Like all our products, we are constantly trying to improve MORE and welcomed your many positive and critical reactions to the third edition. On behalf of the EGGER team, we wish you an enjoyable and engrossing read of edition four, which focuses on “perfection”.

EGGER Group Management

A handwritten signature in black ink, appearing to read 'W. Schiegl'.

**Walter Schiegl**  
(Production/Technology)

A handwritten signature in black ink, appearing to read 'U. Bühler'.

**Ulrich Bühler**  
(Marketing/Sales)

A handwritten signature in black ink, appearing to read 'T. Leissing'.

**Thomas Leissing**  
(Finances/Administration/Logistics)





## THE TOWER THAT TWISTS TOWARDS THE HEAVENS

There are two ways to get to the top of the world's highest wooden walk-in tower: by elevator or by stairs. And there are three ways down: the **51**-metre-long slide in the core of the tower yields speeds of up about 30 kilometres per hour. The 100-metre-high viewing platform on Pyramidenkogel at Lake Wörthersee is a pioneering piece of woodwork. The construction, comprising 16 beams of glued-laminated larch wood, was designed by the architecture practice Kaden + Partner. New technology using glued steel and wood makes the construction especially stable. A model was successfully tested in a wind tunnel. Wood preservation techniques protect the components from water. The architects are confident that people will be able to climb the tower and race down the slide for the next forty years.

[www.kaden.cc](http://www.kaden.cc)



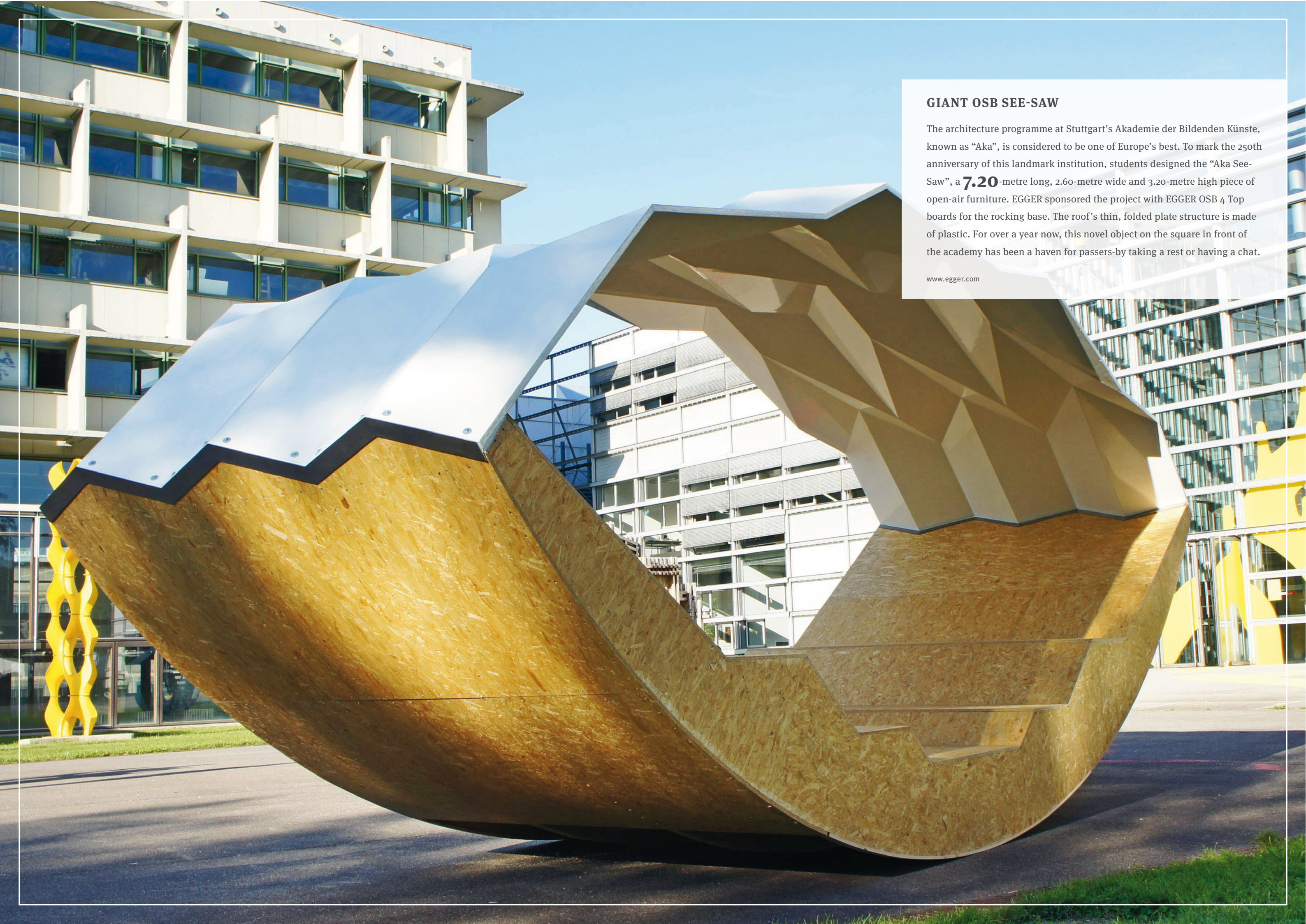
## BATHED IN LIGHT

The eyes account for **70** per cent of all sensory impressions perceived by human beings. Of these, light is the most attractive stimulus. These were the thoughts going through the mind of architect Paulo Merlini when he was asked to design a bakery & café in the Portuguese city of Porto. He decided that light was the best way to stand out in the city's colourful, hectic flood of impressions. He added a second ceiling to the room, made of dense, white wooded lamellas. Not only do the lamellas produce an interesting optical and acoustic effect, they also spread the light evenly. That makes it possible to get the most out of the light without spotlights or dark corners. Visitors to the café are bathed in a comfortable white light. A pleasant contrast to the multi-coloured world outside.

[www.paulomerlini.com](http://www.paulomerlini.com)







## GIANT OSB SEE-SAW

The architecture programme at Stuttgart's Akademie der Bildenden Künste, known as "Aka", is considered to be one of Europe's best. To mark the 250th anniversary of this landmark institution, students designed the "Aka See-Saw", a **7.20**-metre long, 2.60-metre wide and 3.20-metre high piece of open-air furniture. EGGER sponsored the project with EGGER OSB 4 Top boards for the rocking base. The roof's thin, folded plate structure is made of plastic. For over a year now, this novel object on the square in front of the academy has been a haven for passers-by taking a rest or having a chat.

[www.egger.com](http://www.egger.com)



# E\_INSPIRATION

“Quality perception is always about emotions; about the feeling of having something which is of high value.”

Roland Jochem, Quality Science Expert  
Perfection Seen & Unseen (Pages 20 to 23)

## Ideas for Tomorrow



### WOOD WITH TALES TO TELL

[www.vij5.nl](http://www.vij5.nl)

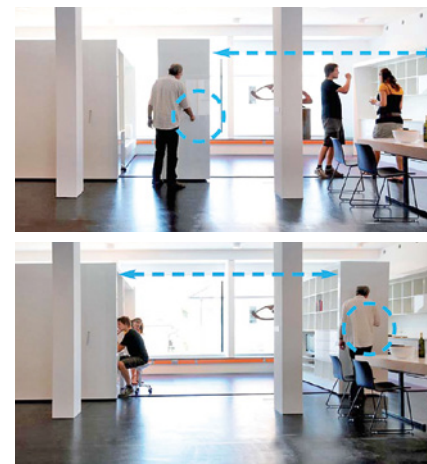
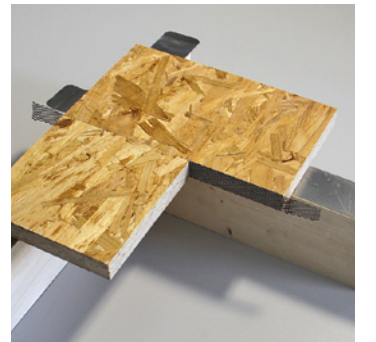
It is a well-known fact that paper is made from wood. Mieke Meijer from the Netherlands turns the tables and makes wood from paper. She calls it “Newspaperwood”. She rolls and glues newspapers together until they form a kind of log. Once the log has dried, planks can be sawn off it. The grain shimmers in an elegant grey and little cracks give the material an authentic look, as the cupboard “Framed” by the designer label Vij5 demonstrates. The front panels are made of four-millimetre thick Newspaperwood veneer. On request, the designers can even say what edition of what newspaper was used. Or use an issue that holds a particular significance for the customer. The day’s stories are then inscribed forever in the furniture.



### STICK A HOUSE TOGETHER

[www.fraunhofer.de](http://www.fraunhofer.de)

For the time being, it is still standard practice to nail or staple the wood-based boards of a pre-fabricated house onto the frame. Until now, adhesives have been too troublesome to use, the drying times too long and the heating of the boards too work-intensive. A super glue at the touch of a button would make the technique much more practical. That is exactly what researchers at Fraunhofer have succeeded in developing. The trick: a metal strip between the individual parts, coated with glue on both sides. The glue heats up when connected with an electrical current... and hardens again in just 60 seconds.



### MAKING SPACE

[www.angeloroventa.com](http://www.angeloroventa.com)

People are living longer, the number of single households and the living space they occupy are growing. That’s food for thought, and not just for city planners. The architect Angelo-Silviu Roventa developed the system “elastic LIVING UNIT”, to get an astounding amount of living space out of the tiniest room: a big table alongside mobile furniture units for all of life’s requirements. They slide to and fro, creating space wherever it’s required at the time. There’s no need for space in front of the desk while you’re cooking, for example. Compared to a 60-m² two room apartment, Roventa achieved a remarkable amount of extra space. If needs be, the entire apartment can be turned into a 40-m² bathroom.



FOCUS: PERFECTION



TOPIC OVERVIEW

- 12—17 More than Immaculate
- 18—19 Case Studies: Glue Factory, Decor Development
- 20—23 Ask the Expert: Interview with Roland Jochem

This Japanese word is composed of the characters “kai” for change, and “zen”, for the good or beneficial.

# More than Immaculate

Quality management is aimed at achieving perfection – yet seldom attains it. That’s why experts prefer the term “quality”. Yet perfection remains the ultimate goal. It is simply a question of culture.

BY Till Schröder

The whitest white in the world remained hidden in the fauna of South-East Asia until recently. It is whiter than milk or a toddler’s tooth and is to be found on the scales of the fingertip-sized Cyphochilus beetle, whose favoured habitat is local white fungi. The observer’s natural instinct is to describe its camouflage as perfect.

But Peter Vukusic is reluctant to use the word “perfect”, on the grounds that it is too subjective. The professor of bio photonics at the University of Exeter in England discovered the insect in 2007 and analysed its ability to evenly reflect the colours of the light spectrum in all directions. This ability is based on irregularly structured scales just 200ths of a

millimetre thick. “However, these scales disintegrate under mechanical friction, which affects the quality of the white”, says Vukusic. “If we are just looking at the purity of the system’s whiteness, we could imagine some improvements.”

Scientists also found the blackest black in an insect: on the wings of the Papilio Ulysses butterfly. And were able to improve on its ability to swallow every last bit of light. A breakthrough was achieved in 2013. In future, technology will help make optical devices in space even more precise. Superlatives such as the whitest white or the blackest black seem to be within reach. But nature doesn’t care about notions of technical perfection. There is always room for

improvement. Taken literally, the word “perfect” means complete or consummate – the final step in a development. But apart from the highest mountain and the deepest valley, there is hardly a superlative in the world that cannot be outdone by humankind’s drive to optimise.

There is an anecdote from the world of cinema that might be closer to reality: the famous filmmaker Billy Wilder was having his best script-writer read him the twelfth version of a scene. The script-writer asked him, “It’s pretty good now, isn’t it?” – “Pretty good?!” , cried Wilder and jumped up. “Pretty good? It’s perfect! – And now we’re going to make it even better!”



1



2



1 Micro millimetre thin scales on the back of the Cyphochilus beetle scatter the colours of the light spectrum in all directions. This quality results in the world’s whitest white. 2 The blackest black in nature is created by scales on the wings of the Papilio Ulysses butterfly, which swallow up the entire light spectrum.





1 “No matter what you write or choreograph, you feel it’s not enough,” said the founder of the world-renowned Alvin Ailey American Dance Theater.  
2 Creativity, passion and careful preparation are the main ingredients of haute cuisine.

*“ In terms of products that are perceived as perfect, a central role is played by characteristics that enthuse. ”*

Robert Schmitt, RWTH Aachen University

→ In business life, quality management (QM) has aimed to systematically control the strive for perfection. Kaizen, the mother of all quality movements, began in 1950s Japan. It means literally “change for the best” and is considered synonymous with the modern-day “Continuous Improvement Process”, or CIP. It’s only natural that quality experts are quite reluctant to use the term “perfection”. An end to the process of continuous improvement is inconceivable.

be achieved in an environment like that”, says Robert Schmitt, member of the board of directors of Fraunhofer Institute for Production Technology IPT. “It merely portrays a snapshot of the finishing line, towards which companies move closer as part of a process of continuous improvement.”

**Perfection pays where it is not only accepted but rewarded**

Perfection can be measured. And what can be measured can be managed. The declared goal of the QM system “Six Sigma” is to achieve processes whereby a maximum of 3.4 out of one million products are defective. That’s as good as error-free. With its focus on the quality of products, Six Sigma differs from other QM approaches such as lean management. Lean management is mainly about keeping waste to a minimum in

production. Nowadays, many companies opt for a combination of the two approaches. But regardless of what they choose: modern-day markets are so dynamic that what worked almost perfectly yesterday may have to be adjusted again today. Therefore, the focus of a modern company culture should not be on perfection itself, but on enjoying the attempt to perfect things.

The next big challenges for quality managers are already looming on the horizon. The volume of data in circulation world-wide is doubling every two years. Experts call this development “big data” and address questions such as how a marketing division can maintain control over fast-growing volumes of customer data so that they can still be used effectively. Another challenge is arising from what are known as cyber-physical production systems (CPPS).

In this new era of industrialisation, known as “Industry 4.0”, systems are increasingly organising, controlling and optimising themselves. Experts are still not in a position to predict how these complex systems will behave in the course of their operations.

So, the perfect picture of perfection looks different from the point of view of manufacturers and customers. For the customers, what is most important is what they get. “In terms of products that are perceived as perfect, a central role is played by characteristics that enthuse and which are not expected by the customer and therefore make a disproportionate contribution to customer satisfaction,” explains Schmitt.

The decisive factor is reaching the point where high quality is not only recognized but also rewarded. Cor-

porate consultant Jürgen Uckert, a physicist and expert in the Six Sigma System, divides customer demands into three categories: first, the “must be” characteristic, which is taken for granted in a product; second, the “more is better” feature, such as higher engine performance in a car, which the customer is also willing to pay for; third, what are known as “delighters”, these are generally new features which surprise the customer in a pleasant way, such as the first airbags. However, the delighters are subject to the laws of the market: “After a while, they can turn into more-is-better features,” says Uckert. That’s why a company has to keep developing new delighters to keep its customers loyal.

Yet delightful products alone do not make a company competitive. It must also continuously remove unnecessary

loops from its processes and structures. It’s about reducing the necessary investment of money, times and raw materials. That is the core principle of lean management. Nowadays, this system for reducing waste is increasingly being combined with the quality-enhancing system Six Sigma to form holistic approaches such as Lean Six Sigma and Total Quality Management (TQM). Each individual employee can play a decisive role by combining their qualifications, motivation and ability to work in a team.

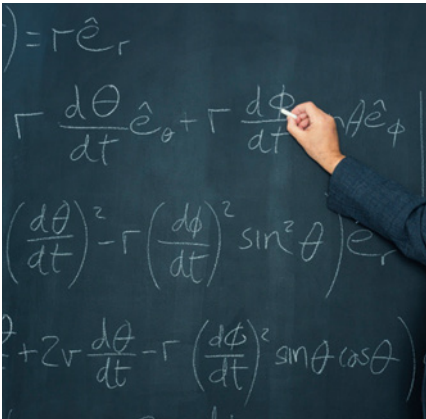
The latest research speaks of a culture of quality, “understood as a collective code of behaviour by employees with regard to quality, which has a significant bearing on the success of a company,” explains Robert Schmitt. This starts with the individual employees, as “enablers” of constant improve-







“Shodo, the path of writing,” is the name given to the Japanese art of calligraphy. Mastery of the art is demonstrated by an ability to interpret precise rules.



Mathematics means literally “the art of learning.”



Practice makes teamwork perfect. In team sports, it makes the difference between winning and losing.

“*Quality is infectious. If the competition is good, the motivation to be better is great.*”

Erich Reiner, construction engineer and member of Werkraum Bregenzerwald

→ ment, because they have more detailed knowledge of processes than planners or managers. “They are a vital source for improvements.”

comprehensive, constructive change management.”

**Skilled craftsmanship as a model for managers: high quality through a direct relationship with each piece of work**

On the other hand, a high level of staff morale can help a company excel. It encourages employees to pay attention to the decisive detail that distinguishes high quality from mediocrity. Managers in charge of processes can take inspiration from experienced skilled workers, who, in contrast to managers, have a direct relationship with each piece of work they produce. For example, how did the high level of quality come about for which the tradesmen of the Bregenzerwald became famous well beyond regional borders? “It’s infectious,” says Erich Reiner. “If

the competition is good, the motivation to be better is great.” The construction engineer sees these skilled tradespeople working together every day. How they communicate independently to make sure there are no problems between the individual trades. How they carefully select a piece of skirting board according to wood colour and grain, so that it matches the wooden floor perfectly, or how they painstakingly plan their cuts so that the mitre joints are spot on and neither brickwork nor service pipes are damaged. “Of course, they could just fit any old ugly skirting board, that’s what makes the difference.”

A member of the Werkraum Bregenzerwald, a regional umbrella organisation for the trades, Reiner says it with a sigh. Because this attitude often yields a level of quality that nobody is willing to

pay for any more – well, hardly anyone: a global star of architecture, Peter Zumthor, whose purist style squarely places the focus on the quality of materials and craftsmanship, has already honoured the high standards of the local trades by constructing two major buildings there. “Nobody made any money on this project,” says Reiner. Yet it exudes a feeling that can no longer be expressed with QM criteria. And without which QM cannot work: simply taking pleasure in perfection.

FROM COMPANY PRACTICE

**CONTINUOUS IMPROVEMENT PROCESS (CIP)**

The quality management system CIP, often used synonymously with the Japanese Kaizen, was developed by the American William E. Deming in the early 1950s. Toyota led the way in implementing it. The concept is based on the premise that a company continuously grows more competitive through constant improvements to the quality of its products, processes and service.

**SIX SIGMA**

This system was developed by Motorola in the 1980s. The stated goal is to produce 3.4 defects per million opportunities, which effectively amounts to zero defects. It is based on the assumption that process deviations lead to product defects and therefore to costs associated with customer complaints and repairs or reworking. The term quality refers not just to the product but also to service and delivery reliability.

**LEAN MANAGEMENT**

Lean management aims to minimise the waste of materials and labour hours within a chain of processes. Lean management focusses on maximising the value-added benefits of all resources for the customer.

**TOTAL QUALITY MANAGEMENT (TQM)**

New approaches to quality management combine the strengths of Six Sigma and Lean Management to create new philosophies. Furthermore, TQM establishes a comprehensive quality philosophy in the company and its surroundings. In developing the model, the European Foundation for Quality Management (EFQM), introduced “result orientation” to quality culture for the first time. Often, the stated goal is “excellence” rather than “quality”.



# Improvement Makes Perfect

By continuously working on its glue and impregnating resin, EGGER acquired considerable technical know-how – enough to build its own plants. Their technology is considered the cutting edge world-wide.

BY Till Schröder

**“ We enhanced the Formox plant with a turbo charger. It would be a shame to release the enthalpy from the process gases without using it. ”**

**Martin Steinhagen**, Head of Resin Plants

The huge cauldron hangs on a weighing scale two storeys below, a scale that registers the tiniest of weight changes: up to 60 tonnes of glue simmer away in the four reactors at the Wismar plant. An employee carefully adds acid – by hand. “It’s one of the few things we still do by hand. It’s safer,” explains Martin Steinhagen, head of the three resin plants run by EGGER at its factories in Wismar (DE), Radauti (RO) and Hexham (UK). “A little bit too much and the liquid in the reactor would turn to a solid mass.” Apart from that, the glue and impregnating resin are produced automatically. The highly complex recipes are developed and archived by the technology centre in Unterradlberg

(AT), EGGER’s core development department, where the recipes are entered in the respective control systems.

In Wismar, computers control all the resin plant’s processes, double-monitored and documented paperlessly by a Manufacturing Execution System (MES) developed by EGGER. “The staff can concentrate solely on their monitoring duties as supervisors,” says Martin Steinhagen. The MES is connected to the central material management’s SAP system for resin production and job planning via a special interface. Thanks to the knowledge acquired through the constant further development of its glue production, EGGER was in a position to

build its own state-of-the-art resin plant for the first time, in Radauti (RO) in 2011. A major contribution to this quality was made by those who work in the plants every day. For example, the staff suggested integrating a turbo charger in the Formox plant for formaldehyde production. “It would be a shame to release the excess pressure from the process gases without using it,” says Martin Steinhagen. So EGGER in a worldwide unique project, along with Formox producer Perstorp and the truck manufacturer MAN, integrated a turbo charger in the plant. It reduces energy costs long term. The innovation was honoured with the “New Energy Award” in 2012.

The Formox plant in Radauti (RO) turns methanol and water into formalin for resin production.



# Attention to Detail

The decors look like real wood. Very few people know how much patience and attention to detail EGGER’s decor developers invest in the computer scans to make them so realistic.

BY Till Schröder

The grain of a type of timber can be described according to colour shades, the curve of annual growth rings and the number of knots. But these are not the only criteria applied by Peter Fabri as he pursues his craft at EGGER – to the point of perfection. He works on the overall picture, on the “harmony” and “naturalness” of a wood decor; terms also used in connection with abstract art. He can spend up to four weeks on the development of a decor, printed in gravure on thin paper. The tool of his trade: a powerful computer with two calibrated monitors and a large graphic pad. Nevertheless, in the final analysis it is his experience in decor development, his eye for detail and the standards he sets himself that make the difference. “I am always critical,” says Fabri. He reworks a picture many times before he sends it to the decor print shop. “I just want it to be perfect.” The technical challenge is to divide up the scanned image of the wood into different colour layers, a process known in the trade as separation. Each layer has its own colour and drawing and determines the engraving on the cylinder. Three layers, printed on top of one another, hence also three cylinders, are the norm for a wood decor – four is the maximum.

The circumference of an engraved cylinder is 1.30 metres. The annual rings must match perfectly at either end of the cylinder in order to produce a fluent printed image. To achieve this, the layout has to be “repeated endlessly”. It’s a tricky requirement because

nature does not produce anything like it. Fabri’s job is to get as close to the natural template as possible with Photoshop. A trained digital media designer like Fabri, who specialises in image processing, needs several years



**“ I am always critical. That is why I rework a picture many times. I just want it to be perfect. ”**

**Peter Fabri**, EGGER Decor Development

of practice before he can reach this level. The template for this precision work is created in the decor print shop where each cylinder prints a different colour. Mixing the paints requires the highest levels of precision to produce perfect hues, annual rings and knots and is called “colour matching”.



A scan is broken up into its colour layers on the computer and carefully processed.



# Perfection Seen & Unseen

What is the point in making a 100% defect-free product if it does not meet the customer's requirements? A conversation with quality science expert Roland Jochem about emotions, obsolescent models and how to get as close to the perfect product as possible.

INTERVIEW Till Schröder



From Practice to Theory: Quality Science  
Expert Roland Jochem.

**MORE: Herr Jochem, when was the last time you bought a product purely because of its high quality, even though you did not need it?**

Roland Jochem: I bought the iPhone 5 for reasons of quality. I simply like its usability and user interface. But I still wouldn't say I bought it without needing it. Being a rather rational sort of person, I generally only buy things I need.

**MORE: A love of the highest quality possible is one of the main selling points for luxury products. What mechanisms are at work here?**

Roland Jochem: Quality perception is always about emotions, about the feeling of having something which is of high value. That's why the iPhone Gold was the first to sell out. Customers perceive the product as exclusive. Exclusivity and perfection also play a role in the marketing of products whose manufacturing requires a high level of manual craftsmanship in order to guarantee a

high quality. Take for example Swiss watches, limited edition sports cars, or the Volkswagen factory in Dresden, where the Phaeton model is made.

**MORE: "Handcrafted" was always considered a seal of quality, yet makers of high end, hand-made cars – Artega, Wiesmann, Gumpert und Melkus – have had to throw in the towel in recent years. Is high-quality hand-craft going out of fashion?**

Roland Jochem: In the case of the companies you mentioned, it's about the price-to-quality ratio on the one hand. The high demands on quality meant that the companies had to go to great lengths, and that resulted in costs. This, in turn, led to economic cost-efficiency problems. On the other hand, there is also a link with the high quality of manufacturing achieved by industrial car-makers, which involve the use of high-precision manufacturing and assembly systems and standardised assembly processes. That means that

Swiss watches are among the few products which can still be effectively marketed with the promise of high, hand-crafted quality.

despite large runs and an increasing diversity of models, they can achieve a comparably high level of quality for lower costs.

**MORE: Is there such a thing as the perfect product?**

Roland Jochem: Perfection is a subjective term. In quality science, we are more likely to use the term "zero defect quality" or "100 per cent quality."

**MORE: How do you get as close as possible to 100 per cent quality?**

Roland Jochem: For me, quality has three dimensions which a company must take into account to remain competitive on the market. Firstly, there is quality of strategy. It affects questions such as product placement, and whether the company's quality strategy includes a management-driven continuous improvement process in relation to products, processes and organisation. The second dimension comprises product quality and process quality. Product







1 Staged quality experiences at the user interface: oven with touchscreen. 2 Handcraft alone is not enough as a seal of quality: a sports car from the bankrupt manufacturer Wiesmann.

→ quality is related both to the quality of the products a company delivers and how customers perceive that quality. Process quality is about shaping quality-orientated and robust processes which automatically, so to speak, generate defect-free, high-quality products. Thirdly, we have to take into account the quality of structure. What we mean by this is the organisational and methodical foundations needed to ensure process and product quality and to implement this quality strategy.

**MORE: What practical role is played by the difference between product quality and the quality perceived by the customer?**

Roland Jochem: The makers of cars and mobile phones that sell well are good examples of how a company can fully

understand and satisfy customer needs. In the development stages, they place special emphasis on the components with which quality is associated and experienced: in cars, for example, how knobs and buttons on the dashboard feel when they are turned or pressed. Nothing is left to chance, right up to the sound they make. Haptic, acoustic and optical perceptions of quality are very important to customers. Or consider the simple, intuitive operation of mobile communication devices. This is an aspect, apart from design, which explains Apple's success. Another strategy can be located in additional functionality, for example a refrigerator display that shows a shopping list. Designing displays and screens also plays a decisive role in the competition between manufacturers of washing machines

or tumble driers. Inside, the machines are nearly all made of identical components. In this case, good quality management emphasises low-cost but reliable technical applications.

**MORE: Is perfect customer service one way to reduce investment in product quality?**

Roland Jochem: It is becoming increasingly difficult for companies to sell their products without service. Incidentally, one of the pioneers in this regard is the elevator industry, where an overall package of product, assembly, and maintenance and service have long since been standard. In other words, the “availability of transport for goods or persons” is the main factor. The automobile sector is adopting comparable models. Services such as DriveNow and Car2go are manufacturer-driven. In this case, they are no longer selling cars, rather “mobility”.

**MORE: Where are the most mistakes made?**

Roland Jochem: At the interfaces between processes or organisational units, internally within companies and externally in relation to other companies. Nowadays, many of my graduates are employed at these interfaces, for example between a car manufacturer and its suppliers. Above all, their work is about communication and precise co-ordination. It involves a lot of people: co-ordination tasks that cannot be performed by IT systems alone. The interface function is also decisive because, in the future, it will be increasingly important to develop and produce in complete value creation networks. For success, it is essential to optimise co-ordinated co-operation between the value creating partners in the network. In order to reduce error sources, companies can minimise interfaces, implement standardised business processes and back up the whole lot with network-encompassing auditing and joint certification.

**MORE: Is the business world not breeding an unproductive apparatus staffed purely by bureaucrats?**

Roland Jochem: Certainly, a lot of mistakes were made in the past in this regard. But it doesn't have to be that way. In a medium-sized company like the one where I worked as a young engi-

*“ In the future, it will be increasingly important to develop and produce in complete value creation networks. That is why quality management plays such a decisive role at interfaces. ”*

neer, quality management did not even exist as an independent institution. At that company, quality is something each individual has to watch out for in his or her own sphere of responsibility or operation. Larger companies try to integrate the quality department as an “internal process consultant.” They support quality-orientated planning and can be asked to help solve quality problems both in the team and in relation to customers. That is one way to give an organised structure to quality-related tasks.

PORTRAIT

**ROLAND JOCHEM**

The director of the quality science faculty at Berlin's Technical University is also Professor for Quality Management at Stellenbosch University in South Africa, a member of the board of the German Society for Quality Science (GQW) and a member of the German Forum for Interoperability (DFI). Having completed his studies in mechanical engineering, he went on to work as a project engineer in a medium-sized engineering company before he was appointed professor. He has written or edited numerous publications, including seven books, and has received many awards.



## 5 THINGS ABOUT

# Resin

Resin is the lifeblood of wood. People use it in all areas of life – it can even be eaten.



## 1 AS A NATURAL RESIN

Natural resin is a collective term for the viscous, sticky and sometimes strong-smelling liquid that, in contrast to synthetic resin, is secreted by trees and insects. It is non-crystalline, meaning that its atomic and ionic structures are irregular. Resins are soluble in organic materials but not in water. The best-known by-products of tree resins include turpentine, a mixture of resin and etheric oils from conifers, especially pine. They exude an aroma appreciated by wood-lovers, who associate it with cosy living quarters. Studies have shown that emissions from resin have no adverse effects on health, even when concentrated 500-fold. Indeed, the vapours from the pinus cembra, or Swiss stone pine, are considered beneficial to health.

## 2 ON THE BALL

For Olympic handballers, playing without resin would be like trying to play football without studs. It's been the bane of some indoor arena operators, whose budgets have been whittled away by the cost of regularly cleaning sticky door knobs and floors after training sessions, matches and tournaments. Proponents argue that without the adhesive qualities of resin, players would lack the necessary grip on their hands and the game would be slower and less attractive to watch. Sports equipment manufacturers came up finally with the answer: a water-soluble "handball wax" based on natural resin. That keeps the game fast and the hall operators happy.



## 3 AMBER

The scientific name for the most common form of amber is succinit. It is not a stone, rather fossilised resin. It has been known to surround insects. These specimens are as old as fossils but the individual limbs and wings of the insects are better-preserved. The most popular kinds include the golden amber found on the Baltic coast. A less expensive form is pressed amber, made by compressing small pieces under high pressure. It was used to make items such as cigarette holders until it was replaced by the even cheaper Bakelite.



## 4 AS FOOD

Mastix, the resin from the pistacia lentiscus or mastic tree of the Greek island of Chios, is considered the best, and not just for oil painting. It can also be used for medicinal purposes, for example as an antioxidant in cancer treatment and prevention. It's also used for making chewing gum and in a range of dessert recipes.



## 5 AS AN OIL SUBSTITUTE

Natural resin varnishes can be made without mineral oil. Varnishes made of natural resins, oils are up to 40 per cent organic and hence renewable solvents are considered healthy and environmentally-friendly alternatives to oil paints made of acrylic resin. Turpentine and citrus peel oils are common essential oils. Binding agents are generally extracted from pine or larch resins. Other forms frequently used include rosin, also known as colophony, made from pine resin or dammar gum from the dipterocarpaceae tree. In contrast to synthetic binding agents, natural resin paints are vapour-permeable and when applied to interior walls, contribute to a healthy atmospheric environment.



# E\_SOLUTIONS

“The world standards for timber-based construction are being set in the German-speaking region.”

Ludger Dederich, Architect, Rottenburg University of Applied Forest Sciences  
Perfect Material for Precision Work (Pages 28 to 33)

## The EGGER Team

### MARGERITA VASILEVA

Laboratory Management, Gagarin (Russia)

Margerita Vasileva was working as laboratory assistant in a milk canning factory when a chipboard plant was built at Gagarin. “I saw the chance of better prospects, applied and got the job,” she says. What she wasn’t expecting was when two years later, EGGER took over the plant. She had mixed feelings about that. The new owner’s international scale was impressive but would she be able to master the new devices and tasks? With some help from her colleagues, she picked it up. Today, the laboratory decides whether a supplier is allowed to deliver his wood chips or resin and whether the new chipboards are up to the EGGER standards. These days, she no longer worries about mastering the challenge, instead she is happy about the new task.



### JÖRG HÜLS

Head of Product Management Flooring, Wismar (Germany)

Since 2002, Wismar (DE) has been home to EGGER’s floor product management, where Jörg Hüls took the helm in 2008. A graduate of environmental engineering, he places his main emphasis on the active further development of products and services. “It’s based on the innovation process that has been implemented throughout the EGGER group,” he says. “We work across factories and departments in partnership with both our own experts and external specialists.” What fascinates him most about his international employer: “We are a team although we are separated by thousands of kilometres.” And yet, he says, there is a familiar atmosphere throughout.

### ANDREA SCHÜSSLER

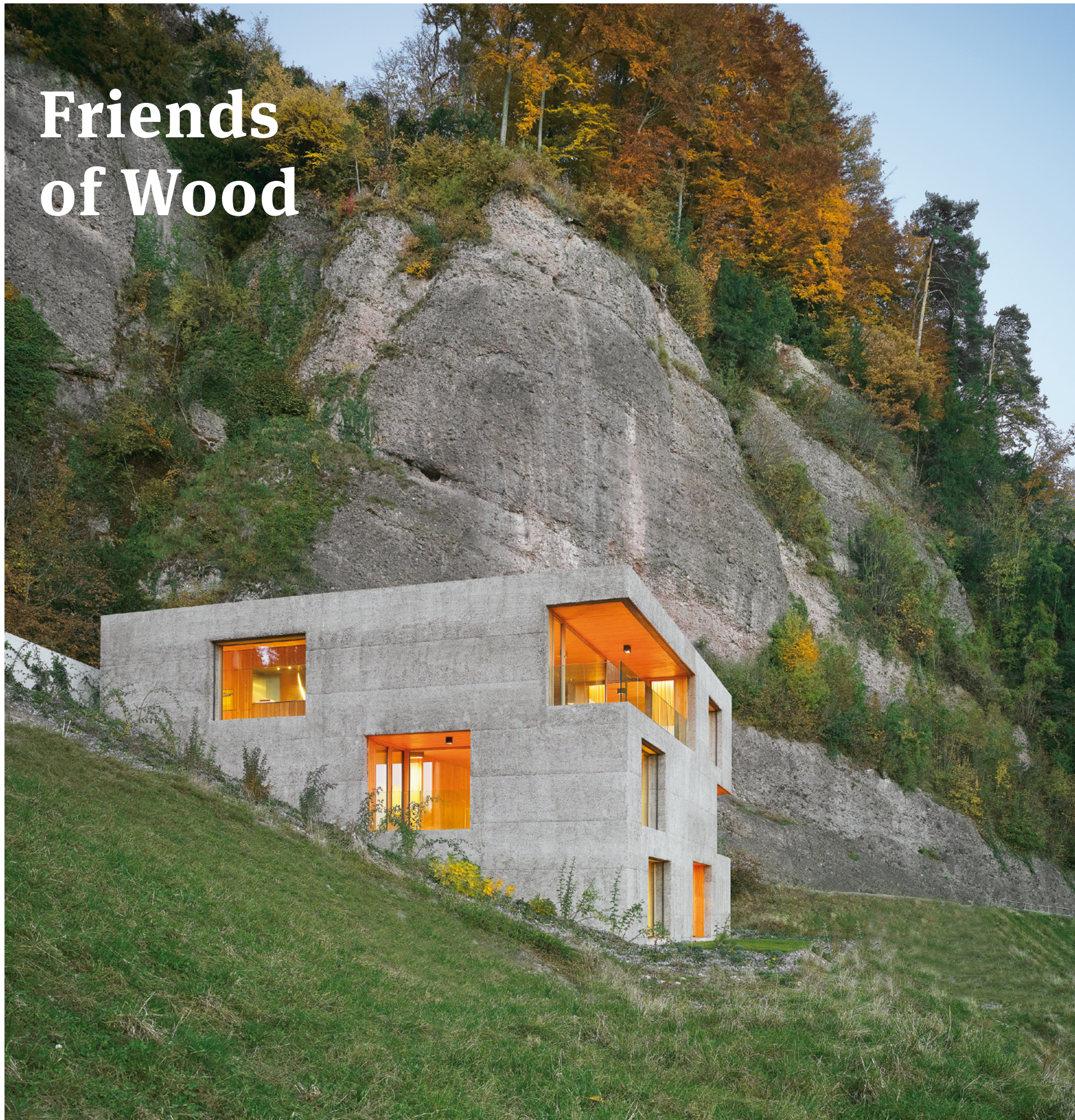
Human Resources Manager, Unterradlberg (Austria)

Andrea Schüssler should have noticed EGGER on her way to her previous employer. “You can hardly overlook the tree trunks beside the main road and the huge factory here,” she says. But EGGER did not come to the attention of this passionate human resources manager until it received the “Great Place to Work” award. Her curiosity was really awoken when one of her “best employees” moved to EGGER. The mother of twins has been in charge of human resources management in Unterradlberg (AT) since 2010.





# Friends of Wood



Mixed doubles in Vitznau: the internal structure was built first. The light coloured concrete exterior blends in with the natural sandstone surroundings.

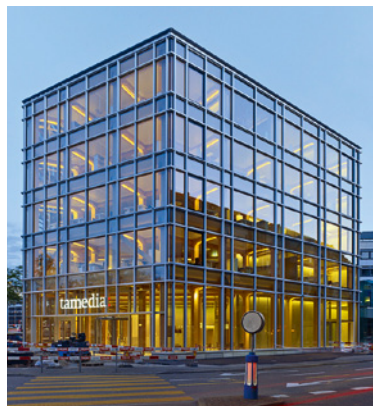
The world's oldest building material has found a new role in modern construction. It makes buildings sustainable, flexible and beautiful. But above all, the material is a good team player, as a look at some of the latest architectural highlights demonstrates.

BY Patrick Fink

At first glance, the building seems to protrude from the cliff face – the colour of the modern façade matches the natural sandstone background so well. Yet behind the concrete shell of this holiday home in Vitznau, Switzerland, stands a wooden building. The architectural bureau Lischer Partner in Lucerne erected the building's core, made of laminated three-layered larch slabs, before having it clothed in light coloured concrete. Visitors enter a concrete building only to find themselves in the cosy atmosphere of a timber house. This solution, involving a prefabricated wooden structure, also won the approval of the jury, who awarded the building the prize sponsored by the magazine "Detail" in 2012.

The building is not just an example of the excellent standard reached in wood construction in Central and Northern Europe in recent years. It is also a model of the modern-day architectural fascination that can be created by combining timber with other building materials.

"The world standards for timber-based construction are being set in the German-speaking region," says Ludger Dederich, professor of timber construction at the University of Applied Forest Science in Rottenburg. Even in Scandinavia, it is know-how from Germany, Austria and Switzerland that sets the bar. That's mainly down to the reliable quality of the products which is achieved through constant monitoring. "Quality is controlled from the forest to the finished building." The level of perfection is so high that in hybrid build-



Office building made of glass and spruce: the new headquarters of the media group Tamedia in Zurich, built to plans by the Japanese star architect Shigeru Ban.

ings, woodworkers can compensate for quality fluctuations in other construction materials. In Switzerland, the quality has been improved by the fact that the interfaces between construction specialists have been tuned to perfection: Swiss architects can bid for jobs with complete teams of static engineers and planners with whom they have already gained valuable experience in previous projects.

No wonder, then, that the Japanese star architect Shigeru Ban teamed up with Swiss engineers to build a radical timber-based construction in Zurich. The entire carrying structure of the seven-storey publishing house was put together with wood, without connecting elements. The load-bearing structure is visible from outside through the transparent façade.







New earthquake-proof library in Auvergne: the façade (above) and interior (centre) made of larch wood counterbalance the cool aura of the ultra-stable base of concrete, zinc and glass.



Four-storey timber apartment building in Bad Aibling’s “zero emissions quarter”: the “H4” was built on the concrete foundations of a former barracks.



The international kindergarten on the UN campus in Bonn, opened in autumn 2013, is a solid timber building that gets by without a heating system.

→ The interplay between warm wood and cool glass lends additional charm to this building, with its beautifully simple cubic style.

Yet wood does not even have to be combined with other materials. It can get by without them, and still fulfil strict energy requirements, as demonstrated by the new international kindergarten on the UN campus in Bonn. Built to accommodate the 120 children of the UNHCR staff, it combines good insulation, a heat recovering ventilation system and geothermal heat exchangers to achieve the passive house standard. For aesthetic reasons, the Munich-based architects Hirner & Riehl opted for solid timber when designing the building, which was inaugurated in autumn 2013: “Somehow, timber and children naturally go together,” says architect Martin Riehl. “And I don’t mean wooden toys, I mean playing with wood.”

Sometimes local conditions make it necessary to combine timber with concrete.

That was the task faced by the Paris architects’ firm G+Architectes in the Auvergne region. They built a new library in the earth-quake prone town of Blanzat, where concrete, glass and zinc provide the necessary stability in the ground floor. The upper floor, meanwhile, has a lamellar façade made of larch wood. The combination reflects the contrast in modern libraries between traditional paper books and electronic publications.

For a long time, fire safety concerns stood in the way of timber in inner-city buildings. However, these prejudices are gradually being refuted and the advantages of timber-based building methods are making themselves felt, especially when it comes to adding storeys. “Since timber-based construction does not require huge building sites, plots that would otherwise be difficult to access can also be reached,” says Ludger Dederich. Thanks to precise prefabrication methods for the individual elements, they merely have to be assembled on site. And because timber is light, it does not overburden existing carrying structures.

This argument quite literally carries weight in the case of the most innovative building project in Germany right now. The multi-storey wooden buildings in the “zero-emissions quarter” of Bad Aibling are built on the cellars and concrete foun-



**“ Since timber-based construction does not require huge building sites, plots that would otherwise be difficult to access can also be reached. ”**

Ludger Dederich, Professor of Timber Construction

dations of a former barracks. The four, five and eight-storey apartment blocks, built to plans by Schankula Architects, went up at a rate of one storey every two days. That was made possible by a high level of prefabrication. The elements were delivered with pre-fitted windows, heat insulation and panel heating.

→





At the 2012 Hamburg International Building Exhibition (IBA), architects explored the opportunities for multi-storey buildings. The “Woodcube” (above) uses solid timber, the “Wälderhaus” (below) has a reinforced concrete core.



Self-carrying wood facade: the GWG Munich's award-winning rehabilitation of a 1950s building involved the addition of a prefabricated construction to the facade. It was fitted with windows and integrated building services.



→ The high esteem in which timber-based construction methods are held by modern architects was also reflected at the 2012 Hamburg International Building Exhibition (IBA). A range of pilot projects there demonstrated how wood can be used even in tall buildings. For example, the five-storey “Woodcube” by the Stuttgart-based Architekturagentur is made of solid wood with a façade of solid timber slabs. The roof, on the other hand, is supported by composite components made of timber and steel. For the “Hybrid House Hamburg”, Nägeliarchitekten Berlin used a skeleton of prefabricated, reinforced concrete components – the non-carrying external walls are made of vapour-permeable wood-frame elements. And for the “Wälderhaus”, Andreas Heller Architects & Designers designed a combination of reinforced concrete and solid timber exterior walls. They are composed of plywood elements. This mixed construction method reflects the building's various possible uses.

#### **Wooden facades as an ecological alternative to mineral-oil-based insulation systems.**

Timber is also increasingly being combined with other construction materials in the rehabilitation of existing buildings. In conjunction with an EU-sponsored research programme, the faculty of timber-based construction at Munich's Technical University developed a large-scale timber-based construction system with which the building's shell can be insulated – an alternative to conventional external thermal insulation composite systems (ETICS). The elements of the TES EnergyFacade are precisely prefabricated in a carpentry shop. The façade construction is self-carrying. Windows and building services, including active solar components, if desired, are integrated in the facade. This new building shell can be attached to the existing load-bearing structure in a very short space of time.

This new system has been successfully integrated in a number of energy-rehabilitation projects – and reaped the rewards. Munich's city-owned housing company GWG Städtische Wohnungsgesellschaft München rehabilitated some of its 1950s apartment buildings in Sendling-Westpark in co-operation with

the Munich Technical University. The project received an award in conjunction with the Deutscher Bauherrenpreis 2013, as did a project by the Augsburg housing company WBG Wohnungsbaugesellschaft der Stadt Augsburg GmbH. Again, the project involved the modernisation of 1950s buildings using wooden façades.

Structural independence between core and façade creates new room to manoeuvre. In Wuppertal, for example, where the university's student residence organisation, the Hochschul-Sozialwerk, constructed three new apartment buildings with highly insulated wooden façades: the planners from the Architektur Contor Müller Schlüter designed a load-bearing core made of reinforced concrete in order to improve fire safety and sound insulation. The façade, made of timber panel components, on the other hand, is not load-bearing. That makes it easier and less expensive to rearrange windows or even floor plans, for example, if the building is subsequently put to a different use. Whether the building's shell is made of concrete and the core of timber, or vice versa – the combination of wood and other construction materials opens up a range of new opportunities. Now these opportunities are being grasped.

Reinforced concrete on the inside, timber on the outside: the windows and floor plans of the three new students' apartment buildings in Wuppertal can easily be adapted to new uses.





## THE PLANT IN GAGARIN



# The Russian Scheme of Things

Timber is a valuable resource. Russia has a lot of it so it's an ideal location for wood processing companies. EGGER is also present in Russia with two plants. The teams there have had to meet some unusual challenges. MORE visited the plant in Gagarin.

BY Till Schröder

It's early October and the first snowflakes are falling. The Mitsubishi lurches and bounces over the rocky road like a boat on choppy waters. "The road is still excellent here," says Patrick Schmidt, while he skilfully navigates the off-road vehicle around the countless potholes. "Our Urals will transport the wood here for temporary storage." The Urals are muscular, long-legged off-road trucks built in Russia. With their clunky radiator snouts, they seem to come from an age gone by, but they are still better-suited than many other models to the tasks at hand here.

Things happen on a different scale in Russia. The world's largest country is home to Europe's richest timber resources. In 2011, when EGGER bought the plant in the town of Gagarin, home to 31,000 people, part of the deal was a 50-year lease on 80,000 hectares of forest. Russian law obliges forestry companies to operate sustainably. That gives EGGER a license to fell 355,000 solid cubic metres per annum. Formal applications must be made for each patch of forest to be harvested and painstakingly entered into the forest map by hand. The state strictly monitors the harvesting and for every unapproved tree that's felled, the company has to pay a hefty fine. To deal with this, EGGER delegated



Gagarin lies not far from the all-year M1 that links Moscow, Minsk and Western Europe. The town was the birthplace of the famous cosmonaut Yuri Gagarin, whose Wolga 21 stands proudly at the entrance to the museum in his honour.



an experienced man who is passionate about his job to assume the role of Manager of Wood Supply in Russia – the Swiss Patrick Schmidt. His wife and children live far away, in Switzerland. All the same, he just could not say 'no', he says. Why? Because, he enthuses,



***“In the event of errors, I co-ordinate the search for the causes. The best way to find them is to work together. ”***

**Anna Yakovleva**, Quality Management

this is the ultimate goal for any forestry manager. "Russia is the future!" In Germany, he says, you harvest 500 solid cubic metres here, 1,000 there. "Here, you can harvest 25,000 cubic metres practically all at once." That, at least, is what was harvested here in the last three months.

"And it all comes out via this route," says Patrick Schmidt, as he puts his foot down and steers the Pajero off the "excellent" road and into a furrow of knee-deep mud.





→ From a distance, you can see the depot with its yellow trailers. Six forest workers are waiting to be relieved. They have been harvesting day and night for the last two weeks: on the night shift, they took a harvester and a ten-wheel forwarder deep into the woods. On the day shift, there were a further two workers equipped with chainsaws for chopping smaller pieces. A cook prepares three warm meals a day for them.



**“ In Germany, you harvest 500 solid cubic metres here, 1,000 there. Here, you can harvest 25,000 cubic metres practically all at once. ”**

Patrick Schmidt, Management Wood Supply

The depot is equipped with hot showers, electricity and floodlights – a luxury for forestry workers by Russian standards. The engine howls, the car lurches to and fro, mud splatters against the windows. We get stuck about a hundred metres from the depot and the forwarder has to be called in to tow the car out. The book-keeper comes to see the lumberjacks on every shift change. She has already got to the depot via a side road and is waiting when we arrive. With her clipboard in hand, she goes from machine to machine and vehicle to vehicle, taking a note of fuel levels, operating hours and food supplies.

Lumberjack Michael Sivukov takes us from the depot to the harvesting grounds in the forwarder. It takes half an hour for the 480,000-euro Ponsse to crawl over muddy ground, through waist-deep water, past dense fens and bogs. This wilderness is home to bears, wolves, wild boar and elks. Running parallel to our track is another path, prepared by the lumberjacks for transporting timber back in the coming winter months. Tree trunks are laid out to buttress the banks and where the water is too deep, channels have to be dug to drain it.

Patrick Schmidt expects freezing temperatures from November onward. “Then the track will be as hard as concrete, a perfect surface for the Ural,” he says. MAN trucks take the harvest from the temporary storage depot to the plant.

The log piles are stacked in the clearance, carefully sorted by variety: on average, 50 per cent is made up of birch, 30 percent by the poplar aspen. The remaining 20 per cent is spruce. Lone trees still stand in the cleared area. “As nesting grounds for the birds,” explains Patrick Schmidt. This is not required by Russian law but by the EGGER philosophy. When the wood is cleared, the team will plant two million spruce saplings, just twelve to 15 centimetres high, and tend to them for the next ten years. The pioneer species birch and poplar will re-inhabit the area by themselves. Another harvest will not be possible for at least 50 years.

So is it the rich timber resources that make this latest of EGGER’s plants so important for the family-run company? “Not just the resources. The sales market is also huge,” says Peter Weismayr, technology and production manager at the Russian plants in Gagarin and Shuya. Russia belongs to the emerging markets. “The raw and upgraded chipboards we manufacture here are sold almost completely on the Russian market.”

The business calendar is also different in Russia. “The market is very volatile” according to Weismayr. The many springtime holidays put the brakes on Russian economic activity. Furthermore, many roads are closed to trucks when the first thaw sets in, because the ground beneath the tarmac gets too soft. “And then come the summer holidays,” says Weismayr. “So the main season for selling chipboards is from September to December.” The key is to be ready for the autumn peak. Therefore, the first measure adopted after buying the plant was to build a new workshop. Otherwise, the plant, which went into operation in 2009, was well-equipped by its founder, with a brand new chipboard press made by Dieffenbacher. The plant in Gagarin, about 180 kilometres south-west of Mos-



2



1 The Ponsse harvester on the way to the clearing area. 2 Ural trucks transport the timber out of the woods. 3 A cook prepares three hot meals a day for the lumberjacks.



cow’s Red Square, is reached via the all-year M1 highway that connects Moscow, Minsk and Western Europe. The city was named after its most famous son, Yuri Gagarin; the man who ventured into space and became the first human being to orbit the Earth.

EGGER is also willing to venture into uncharted territory. The plant in Shuya, north-east of Moscow, was built from scratch by the Austrian wood-processor. The company was able to hire its new staff entirely according to its own criteria. In Gagarin, on the other hand,

EGGER took on all 500 Russian employees when it took over the plant. So conditions were completely different. First of all, the top priority was introducing a tight management structure according to the principles of the EGGER organisation: “When we started out, management responsibilities were spread out among too many people,” recalls Peter Weismayr. “Today, a small team and I are responsible for technology and production at the two plants.”

The new Russian colleagues got to know a new management style at EGGER,

based on flat hierarchies and employees who take the initiative and assume responsibility. The quality of work and produce here is mainly judged according to the results. Therefore, working culture is at the core of the company’s quality management. That’s in the hands of the two young Russian employees, Anastasiya Cherkasova and Anna Yakovleva, who are there to help the production manager Hazan Ayyildiz. The spirited technician worked for EGGER for 34 years at its plant in Brilon, which is also where his family lives. Now, his experience is in demand at other locations, too.





→ He has already optimised a number of manufacturing plants for EGGER. “Normally, a job like this takes two or three years. I’m expecting this one to take four.” In the past couple of years, his team was able to increase capacity to more than 1,500 cubic metres a day while maintaining the same quality. “We’ve had to change a lot of things to achieve that,” says Ayyildiz. “We optimised processes in order to exploit the available capacity as much as possible.” Among the bottlenecks were the hacking and drying processes. The fact that this small team, backed up by technicians from Germany and Austria, succeeded in systematically clearing the bottlenecks is down to their technical expertise, their angelic patience and the new company culture.

Here, problems are addressed immediately. It’s a new development: now, measures are adopted and implemented as quickly as possible. Ayyildiz, Schmidt and Weismayr learned Russian in order to communicate with their local colleagues. Communication is also the key word when it comes to the tasks facing the two quality managers. “If the operator discovers a fault in the chipboard laminating process, he comes to me,” says Yakovleva. She gets the production manager, the technicians and the laboratory workers together and co-ordinates the search for the source of the problem. “The best way to find out is to work together.” 24-year-old Anna Yakovleva says the goal of the current phase is to keep quality stable. She represents a young, open-minded new generation of Russians. Having started her career with EGGER, she got to know and appreciate the company’s working culture as the norm. “Older Russian colleagues, on the other hand, have to get used to it,” she says. “They used to perform their tasks one-by-one, according to a list.” When they signed a docket, they were passing on responsibility like a hot potato. Now, Ayyildiz and the quality managers offer incentives and training courses to foster a sense of responsibility. The employees realise that their work becomes more interesting when producing results becomes a personal goal. Tyrol, seen from the home town of the famous Soviet space pioneer Yuri Gagarin, may seem as dis-

tant as planet Earth from the window of a space craft. But appearances can be deceptive: the family company remains true to its ideals in far-away Russia, too. “EGGER stands for humanity and reliability,” says Weismayr. “People here know that we pay our rent and salaries on time and support social projects.”



**“EGGER stands for reliability. People here know that we pay on time and support social projects”**

**Peter Weismayr**, Manager Technology and Production Russia

He tells us the plant promotes the construction of kindergartens, schools and roads and takes care of staff and their family members if they fall ill. The almost limitless forests and the dynamically growing market at the gates of the plant help maintain an atmosphere of optimism and enthusiasm among the employees. EGGER has found its place in the Russian scheme of things.



**1** EGGER produces and upgrades chipboards on the outskirts of the town of Gagarin. **2** The new gatehouse, built using EGGER products, shortly before completion. **3** After pressing, the chipboards cool down in the star cooler before they are stacked.

## Russia in Numbers

In order to reduce its reliance on the international oil and gas markets, the Russian government has pledged to promote and modernise other branches of industry. Forestry and agriculture are traditional candidates in the country with the world’s richest forest resources. A fifth of the world’s forests are in Russia. A third of them are made up of conifers.

**GDP in billions of USD (\*Projected)** Source IMF

2009	1 222,7	–7,8%
2010	1 487,3	+4,3%
2011	1 850,4	+4,3%
2012	1 953,6	+3,6%
2013	2 109,0	+3,7%*

Per cent: Growth compared to the previous year

**Forested Areas by Comparison** Source SoEF2011

809 100	Russia
15 954	France
11 076	Germany
3 340	Austria
2 881	England



# E\_NATURE

“You see old timber. I see a new forest – albeit just a secondary forest.”

Alfred Teischinger, Timber Technology Expert, BOKU Vienna  
Radical Renewal (pages 42 to 45)

## Living Sustainably

### NEW WOOD FROM THE OLD DAYS

[www.roggemann.de](http://www.roggemann.de)

During the century in which the timber for this new parquet floor was felled, the Thirty Years' War was fought, the Turks were camped outside the gates of Vienna and Galileo, Newton and Descartes were the leading minds. The oak and spruce piles, once driven into the mud of central Berlin to build a palace, are about 400 years old. It was not until 2013 that they were pulled back out of the earth and auctioned off. The timber is currently being turned into furniture, beams and jewellery. The Roggemann carpentry workshop intends to fashion a new wooden floor out of the biggest section – a stele gives us a hint of what it will look like.



### A SMARTPHONE THAT LOGS LOGS

[www.fovea.eu](http://www.fovea.eu)

Mobile computer technology is revolutionising forest management. Tablets and smartphones accelerate forest inventory work; hidden trackers in logged timber help catch thieves. And if someone wants to know the value of a log pile at the side of the track, he no longer needs to count every log. German scientists in Hildesheim have developed an app that counts the number of logs, the cubic metres, and solid cubic metres of an average log pile in about two minutes. The developer, Fovea, says it expects “enormous potential cost savings” for the timber industry due to the time saved and the simplification of logistics.



### STRADIVARI RELOADED

[www.empa.ch](http://www.empa.ch)

Mycowood, timber treated with fungi, is the stuff that violinists dream of. Francis Schwarze, expert in related timber research at Empa in Switzerland, discovered two types of fungi in Norwegian spruce that give wood the vibration properties of a Stradivarius. A blind-folded, specialist jury was unable to tell the difference between a real Stradivarius and the modern copy.







A CONVERSATION WITH ALFRED TEISCHINGER

# Radical Renewal

In Alfred Teischinger's view, there are some heavyweight ecological arguments pointing to a great future for timber.

E\_NATURE

Although wood is considered the oldest building material in the world, timber technology is still in its infancy. A conversation with Alfred Teischinger of the University of Natural Resources and Applied Life Sciences (BOKU) in Vienna about wood's strengths and its future role in saving the world.

INTERVIEW Jan Ahrenberg

Anyone trying to make an appointment with Alfred Teischinger soon finds out that timber research is an international business nowadays: there was a small window of time for MORE in Vienna, in between appointments in Milan and Berlin. But it turned out to be plenty. Relaxed and charming, he chatted with MORE in his old domain at the Institute for Timber Research in the district of Mödling, about his favourite topic: wood-based materials and untapped potential.

**MORE: Professor Teischinger, we usually take a walk in the woods with our interview partners for this series. But with you, we're standing in a warehouse for old timber.**

Alfred Teischinger: You see old timber. I see a new forest— albeit just an urban or secondary forest.

**MORE: I'm afraid you're going to have to explain.**

Alfred Teischinger: It's quite simple – essentially, a forest is a system that turns CO<sub>2</sub> and sunlight into the biomass that is wood by means of photosynthesis. This biomass can be used as a working or building material or as a source of energy. The same material is contained in old furniture, timber-based constructions and the likes. I can use it to produce energy, chemically divide it into its individual components or mechanically recycle it into a new material.

**MORE: That doesn't sound like the kind of idea that springs to mind during a walk in the woods.**

Alfred Teischinger: For me, it's not

about romanticising the forest. The woods have always been a source of raw materials and resources. Industrialisation and the use of new energy sources such as coal and new materials such as steel, aluminium and plastics greatly reduced the significance of wood as a raw material. For years, we paid too little attention to innovation and technological developments, especially when it comes to construction and finding new uses for wood. That was a fatal error. Today, we have the arduous task of making up lost ground. Because, from an ecological and economical point of view, timber offers well-known advantages over the synthetically produced materials in use today.

**MORE: Petrochemicals have the decisive advantage that its products can be shaped at will and used in almost equally diverse ways. What about wood?**

Alfred Teischinger: The Petrochemicals industry uses up a considerable amount of raw materials and energy in order to achieve the advantages you mentioned. That's why I don't think we should take it for granted that plastics are the superior materials. We ought to be turning the argument around and asking: what do we have to do to make the raw material that is timber just as versatile in the future as plastics or metals are today.

**MORE: Do you see a kind of timber chemicals as a substitute for petrochemicals?**

Alfred Teischinger: Some colleagues do see it that way and they are making amazing progress. A Finnish colleague of mine, for example, discovered a few







The media in his native Austria dubbed him “Mr Wood”: Alfred Teischinger.

→ years ago that the branches of trees contain numerous antioxidants that can be used as phytopharmaceuticals for cancer prevention. In the timber industry, however, knots and branches are still viewed as disruptive factors that must be cut out and burned because they weaken the material. For me, timber chemicals are merely a niche topic – albeit it an interesting one.

“ There will be an entirely new kind of material engineering. The latest lightweight construction concepts are going in this direction. ”

**MORE: Why?**

Alfred Teischinger: Because their field of application is very limited. The petrochemicals industry consumes just six or seven per cent of the crude oil extracted worldwide. The lion’s share is burned

up in engines and power plants for which timber is not an alternative. Timber’s decisive contribution to saving the world, if I may put it so crudely, is to be made in the furniture and construction industries. Cement producers alone, according to a WWF study in cooperation with the industry giant Lafarge, are responsible for ten per cent of global CO2 emissions. And that’s not counting the glass, metal and insulation industries.

**MORE: But is wood not a still a niche product, especially in the construction industry?**

Alfred Teischinger: Yes but one that is posting impressive growth and can boast a long tradition. There is a once rudimentary but now growing understanding that we will only achieve genuine progress in the use of this natural raw material if we develop new technologies for processing it. That happened long ago in the steel and plastics industries. With the result, for example, that today you can buy low-cost chairs made of these materials. Yet it was Thonet chairs, which were the first to use the principle of the unassembled and therefore easily transported piece of furniture, later adapted by Ikea. At the beginning of the 20th century, the company was able to store 34 chairs in one cubic metre of space – because of that, and the fact that they are so durable, you can still find these models in Brazilian cafes.

**MORE: What do you think the industry has to do to promote technological development in timber processing?**

Alfred Teischinger: A holistic and optimised use of the raw material timber would be desirable, even if that raised numerous as yet unsolved logistical questions. A range of process chains have developed for the resource wood, some of which are interconnected but also in competition with one another. We can see this in the debate about the primary use of timber for energy. This is sabotaging a potential ‘utilisation cascade’, since the resource is no longer available for material purposes once it has been used for generating energy. So the goal has to be to use the raw material timber first as a construction or working material or raw material for

chemicals and then to use it again for generating energy.

**MORE: Where do you see the most promising approaches right now?**

Alfred Teischinger: For timber as a raw material to end its niche existence in the construction industry, it is essential to develop innovative wood-based materials with reliable characteristics. OSB boards, like those produced by EGGER, was a first step. They react predictably to climatic fluctuations and structural loads. That makes them suitable for use in large commercial construction projects and not just for building private homes.

**MORE: At the beginning of our conversation, we spoke about the need to make up technological ground. What are the most pressing tasks, in your opinion?**

Alfred Teischinger: The main task is to improve the performance characteristics of the materials and produce them in a cost-efficient manner; for example, new methods of mechanically processing the raw material timber that preserve the original stability features of the tree itself. The cost-intensive technologies for drying wood and the optimisation of laminating procedures are additional topics. There will also be an entirely new kind of material engineering. The latest lightweight construction concepts are going in this direction. The use of alternative raw materials from the agricultural industry and hybrid materials are other research hot spots. Recycling and a design for recycling are also growing in importance. Radically new approaches in material development and the new manufacturing and process technologies that accompany them take ten to 15 years to reach the market. That’s a big challenge for company managements, which are quite impatient in this regard!

**MORE: At what point of the technology leap are we? – At the beginning or in the midst of it?**

Alfred Teischinger: In some processes, we are already in the midst of it but in terms of radical innovations we are at a fairly early stage. That’s why I find it so interesting to be a part this process.



1 A trip down memory lane: Alfred Teischinger taught up-and-coming timber technicians at Austria’s largest vocational school, HTL Mödling, more than ten years ago.

2 Secondary forest: as far as timber technologists are concerned, used or discarded wood is just as valuable as freshly cut timber.



PORTRAIT

**ALFRED TEISCHINGER**

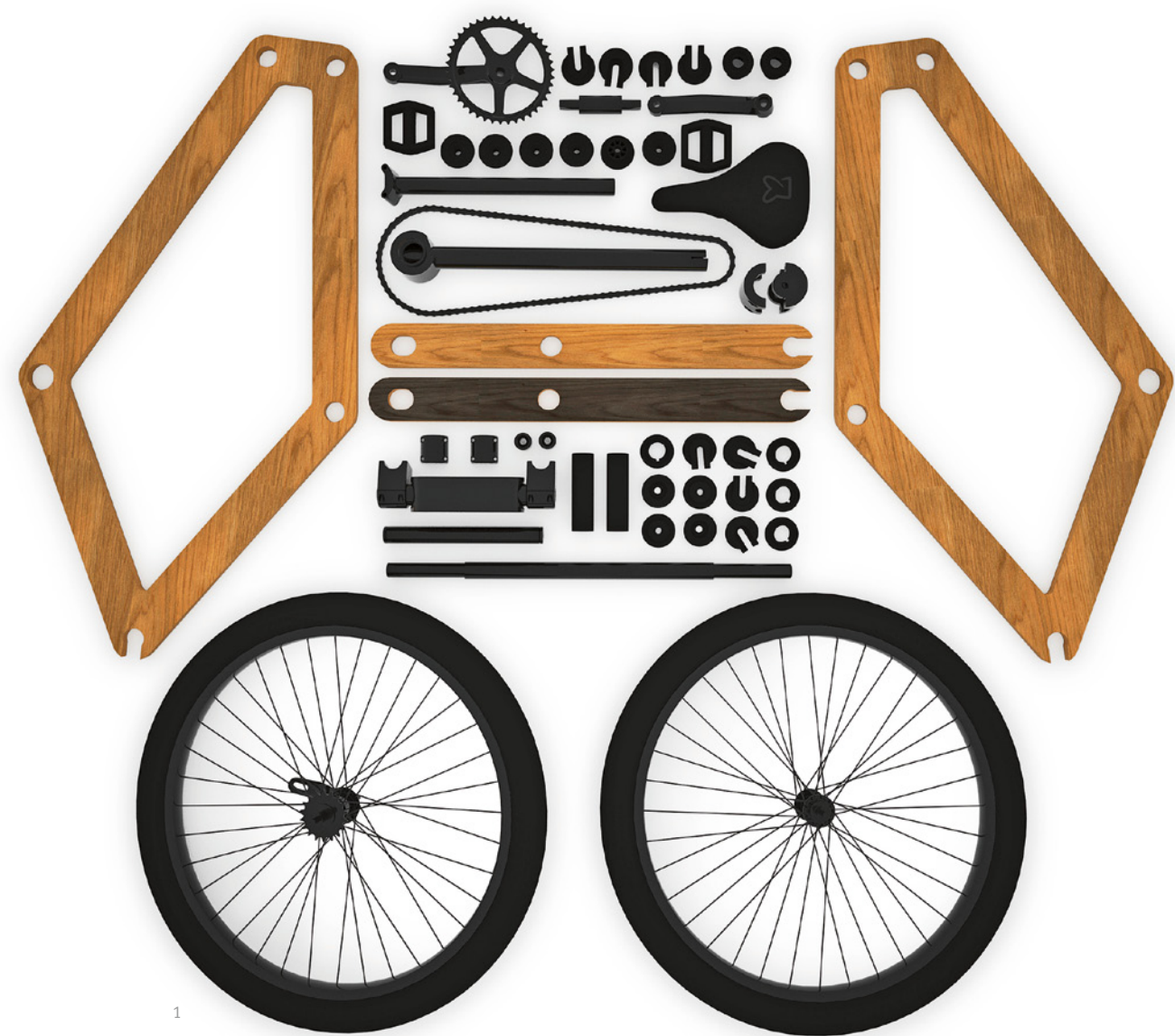
Publisher of specialist periodicals, member of numerous scientific societies, advisor, consultant, organiser of symposia. There is hardly another timber scientist who gets around as much as Alfred Teischinger, whose academic qualifications include a professorship, a PhD, an engineering degree and an honorary doctorate. He holds a chair at the University of Natural Resources and Applied Life Sciences in Vienna. He is also director of Wood Kplus, a competence centre for wood composites and wood chemistry.



# Reinventing the Wheel

Racing bikes carved out of precious mahogany, ready-to-assemble plywood bicycles and a beech frame inspired by the functionality of a leaf spring – the bicycle industry has rediscovered an old material.

BY Clemens Niedenthal



**1** Build and ride: it takes a good half hour to assemble the almost 50 individual parts to make a fully functional bicycle. **2** Flat pack: the “Sandwich-bike” is delivered free of charge – in a standardised cardboard box.



The mail often comes by bicycle. This bicycle comes by mail. In a handy cardboard box that looks more like it contains a winter jacket or something. Or a ready-to-assemble garden chair. The flat pack contains about 50 individual parts which even a novice, with a little bit of patience, can put together to build a bicycle. A bicycle? A wooden bicycle, to be precise. The “Sandwich-bike” by the Dutch designer Basten Leijh is so devoted to combining and connecting that even its frame is made up of two matching plywood rhombuses that are bolted together. Beech wood, multiplex boards, PEFC-certified. After about thirty minutes of twisting and tightening, the owner is left with a cool-looking cruiser, which is almost as relaxing to ride as the classic type so typical of the Netherlands. It’s a bicycle for cruising, to see and be seen with.

The ready-to-assemble designer bicycle has been on the market since October 2013 – after a seven-year development phase that also involved technicians from the automobile industry. Among the driving factors for them were the prospect of making moving parts out of wood and the potential opportunities that created.

And there’s another Dutch designer devoted to the timber bicycle. Jan Gunneweg already wears his passion on his nose – the “Houten Zonnebril”, a sports sunglasses with a flexible plywood frame, the latest creation by his little designer studio, which is devoted above all to wood. His “Bough Bike”, on the other hand, is made of solid wood. French oak, according to Jan Gunneweg, naturally from sustainable forestry. The brown tyres and the fine

British leather saddle match the honey-brown colour of the frame. And while the Sandwichbike is largely a vehicle for a cool design idea, the Bough Bike is a fully-developed, even mature bicycle. For day-to-day commutes to the office, for example. Or for tourists who cruise around Amsterdam or the North Sea island of Sylt. “We have indeed sold some bikes to hotels and we understand that the guests are delighted with them. Maybe because when you’re on holidays, you have time to look at things from a different perspective.”

And from that perspective, wooden bicycles look like a sustainable and constructive idea. Bought by people with a passion for beautiful things and an awareness for how they spend their time. Riding instead of racing, a nice way to slow down.



Natural Habitat: the “Bough Bike” comes from the cycling metropolis of Amsterdam. Childhood Memories: the design is reminiscent of training bikes for toddlers.





The mahogany has been stored for up to 40 years at the wharf in Koto City. It was originally intended for use in prestigious yachts. Now, Sueshiro Sano turns it into nine-kilo sculptures of racers that cost about 20,000 euros per piece.

→ Karl Friedrich Christian Ludwig, Freiherr Drais von Sauerbronn, or Karl Drais for short, springs to mind. In 1817, he set up a “running machine” on two wooden wheels. The vehicle, later to be known as the “Draisine”, marked the start of the bicycle’s development. The first pedal-driven bicycles were also made of timber. Produced by coach-builders, known back then as wainwrights.

**“ People like to romanticise wood. But it’s an absolutely high tech material. ”**

**Marcus Wallmeyer**, Designer des Waldmeister Bikes

Around 1870, steel spokes became the norm. Soon, bicycles were largely made up of metal. Has the bicycle industry been barking up the wrong tree?

There is a catch: the solid timber Bough Bike weighs around 20 kilogrammes. In the borough of Koto City in the Japanese capital Tokyo, Sueshiro Sano sent his wooden bicycle on a diet, using plane and milling cutter. It’s down to just below eight kilogrammes now: for bicycle number 15 he also hollowed out the handlebars and the saddle.

But how did Sano , now 55 years old, get the idea of making bicycles out of well-stored, well-dried mahogany? It is a story about several passions – for the timber, for the craft and last bit not least, for racing bikes.

Sueshiro Sano originally comes from a boat-building background. For 200 years, his family has been building mahogany yachts. They have handed down their skills and traditions from generation to generation, cultivating a culture of precision. Even the timber this avid track rider uses to make his bicycles was bought by his father. It’s been stored at a wharf in the south of Tokyo since the 1980s. In recent years, it has spent longer than usual in storage. Demand for expensive solid-wood boats has dwindled in the economic crisis. So Sueshiro Sano had timber and he had time. In 2008, he completed his first mahogany racer. Since then, he has been producing just four per year – hand-carved sculptures, customised sporting equipment. A bike like that costs around 20,000 euros, which is actually a fair price. For Sueshiro Sano achieves an almost obsessive perfection that makes him a master of fine craftsmanship and the art of the aesthetically possible.

Marcus Wallmeyer also returns to the topic of money time and time again.



The idea behind the “Waldmeister Bike” is a wooden frame with the characteristics of a leaf spring: stability and, at the same time, flexibility. Each frame is made up of 96 0.5-millimetre layers of wood.

When journalists come to visit him in Freiburg, they always want to know the price. The frame, made of 96 layers of laminated beech wood, costs 8,000 euros. A full “Waldmeister Bike” costs about 12,000 euros. Carbon fork, disk brakes, Brooks saddle: exclusive components for an exclusive bike, which is now manufactured by an automobile industry supplier that usually specialises in making wooden prototypes for the likes of BMW.

Marcus Wallmeyer is also a product of the automobile industry. He studied transportation design in Pforzheim and Los Angeles and even while he was a student, he had this off-the-beaten-track idea: he wanted to design a bicycle, not a car. Made of wood. “I was thinking of a leaf spring like an old

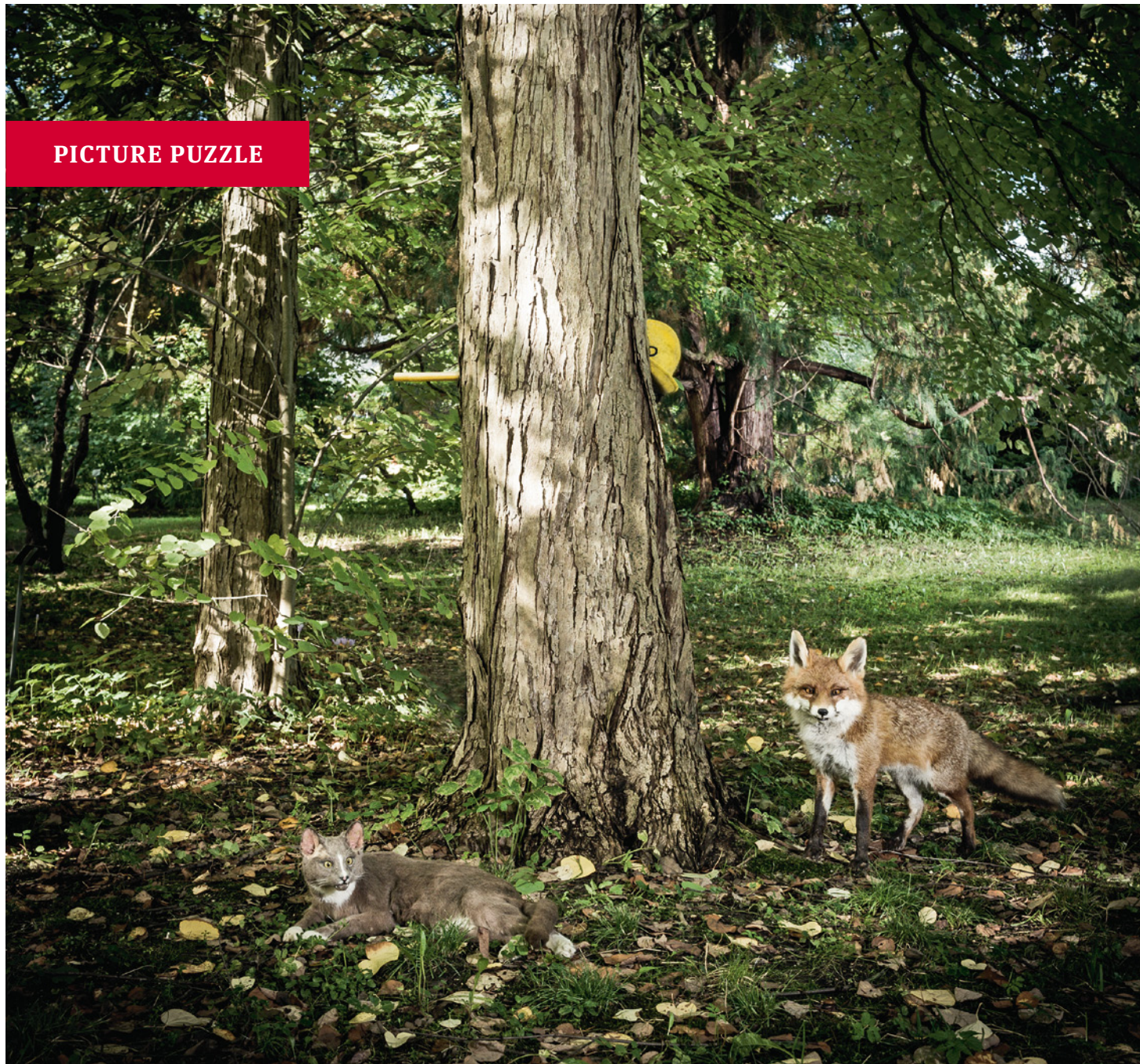
horse-drawn carriage. That was how I envisaged the frame: as an interpretation of a leaf spring, stable and yet springy and shock-absorbing.” Now 37, the designer realised his bold idea with a radical trick: the Waldmeister Bike gets by without a seat post as a stiff connection between the saddle and the pedals. Instead, the frame functions like a suspended piece of bentwood furniture. A cool concept and an even cooler feeling when riding it, without having to sacrifice sporting precision: “People like to romanticise wood as the material of bygone eras. But timber is an absolutely high tech material.” High-quality, handcrafted furniture also get a mention when Marcus Wallmeyer talks about his bicycle and indeed, some of his clients display their Waldmeister Bike in their living rooms like a

piece of exquisite furniture. Wallmeyer’s wooden bicycle is a high tech creation. Its function is perfect in form – and its formal design perfect in function. Above all, though, it is intuitively natural: anyone who has ever climbed a tree is familiar with this primeval trust in the material that is wood, this literally carrying relationship. “That was my central finding,” says the designer, “I did not design a bicycle made of wood, I designed it with wood, I let myself be guided by the characteristics of the material.”

So he got stuck into the task of laminating, layer for layer, using 96 wafer-thin sheets of wood to quite literally create a new framework. A sustainable vehicle for the future of one the most sustainable modes of transport.



## PICTURE PUZZLE



## Tree-Huggers' Corner

This tree-hugger's name tells us what timber he's made of: pine. However, carving this otherwise tried-and-tested material was fraught with problems. His owner just could not get his creation under control. It went missing and turned into the driftwood of life. This naïve creature was easy pickings for thieves and false friends. But he grew wiser with experience and grew into a virtuous human being made of flesh and blood. So the organisers of the World Cycling Championships 2013 in his city of birth made him their mascot. They may have been unwittingly referring to the doping scandals that have rocked this wonderful sport in recent years. After all, the outstanding physiological characteristic of the tree-hugger we

are looking for has long been associated with one of humankind's most common vices. What is the tree-hugger's name? Send the solution to [MORE@egger.com](mailto:MORE@egger.com). Correct answers will go into a draw for a "Gleichdick" designer stool by Sebastian Schubert. Closing date for entries is 31 May 2014. There is no right to redress through the courts.

---

The picture puzzle in MORE 03 featured an archer hidden behind the tree. The personality in question was Robin Hood. Our thanks to all those who replied. The winner, Corinne Madone from Marseille (FR) received the Clic stool by EGGER.