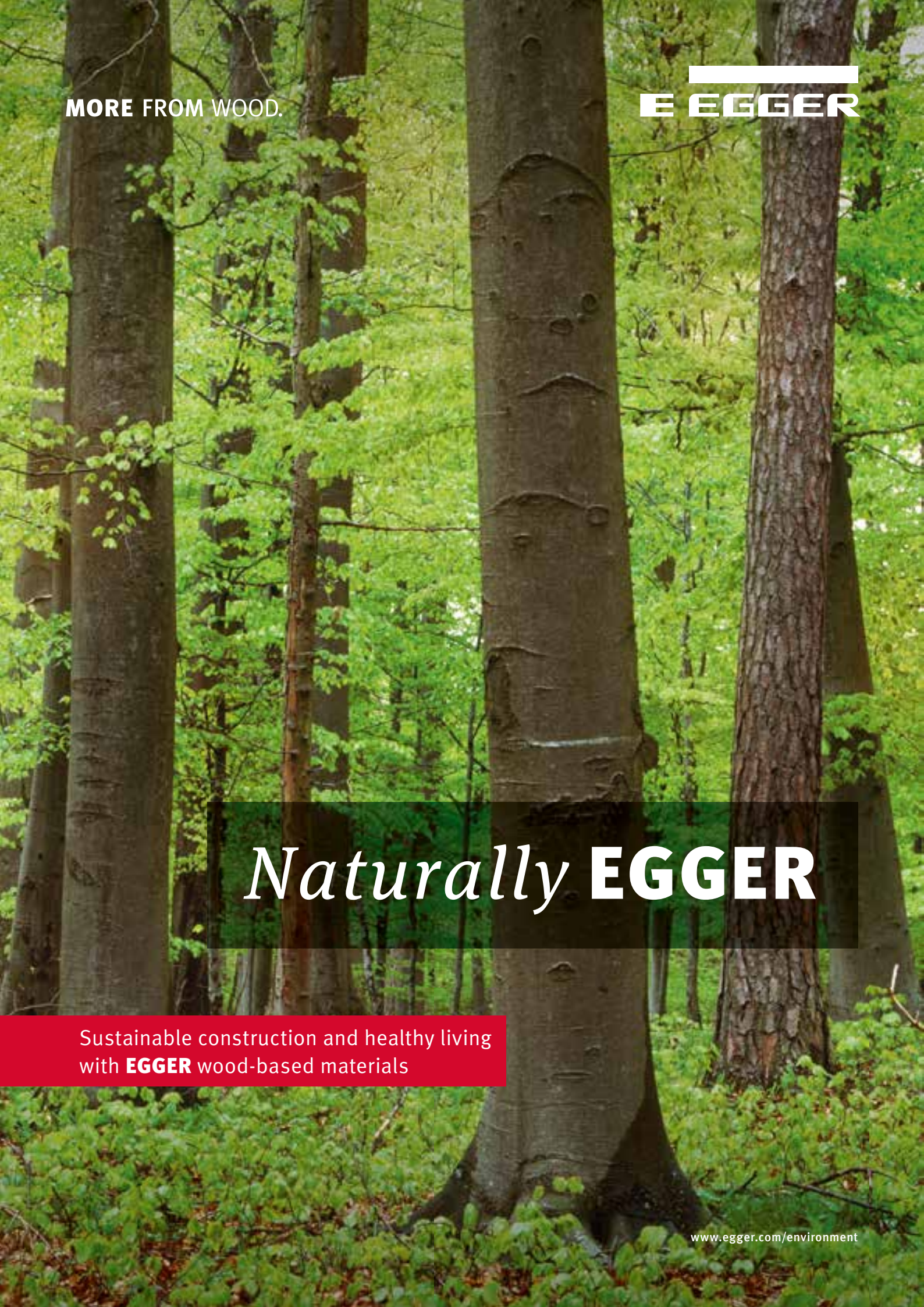

MORE FROM WOOD.
E EGGER
Naturally EGGER
Sustainable construction and healthy living
with EGGER wood-based materials
www.egger.com/environment

“Wood is far too valuable to just throw it away!”

Fritz Egger Senior (1922 – 1982)

CONTENTS

Our Milestones for a Healthy Environment

1961

EGGER produces its first chipboard. It blazes the trail for technology that makes “More from Wood”.

1991

EGGER integrates the first biomass power plant at the site in Brilon (DE) to replace fossil fuels. Shortly thereafter, the plants in St. Johann (AT), Hexham (UK), Rion des Landes (FR), Rambervillers (FR), Wismar (DE) and Unterradlberg (AT) are also equipped with biomass heating and/or power plants.

1992

EGGER implements a new exhaust air purification process with the world’s first wet electrostatic precipitator in the industry.

1993

EGGER St. Johann (AT) heats the municipal swimming pool, by recovering the heat from its exhaust air generated from chip drying.

1995

At the plant in Brilon (DE), EGGER first used recycled wood for the production of chipboard. Virtually all of the EGGER plants today make this valuable contribution to the conservation of resources.

2002

EGGER establishes Timberpak in Leeds (UK): a waste wood recycling centre. The recycled wood is used for chipboard production at EGGER Hexham. The founding of Timberpak Washington (UK) and Bellshill (UK) follows in 2011.

2006

To conserve resources, EGGER invests in lightweight boards with a honeycomb core made of recycled paper. The world’s first industrial plant commences operation in St. Johann (AT).

EGGER is the first European manufacturer to sign a contract on behalf of the entire group for the external monitoring of its plants and products by the Fraunhofer Institute WKI.

2007

EGGER receives the Austrian State Prize in Transport Logistics for the project “EGGER Logistics Systems with Environmental Benefits”.

2008

Nomination of the Energy and Environmental Project in St. Johann (AT) for the European Environmental Innovation Prize (EEP).

EGGER is the first wood-based material manufacturer in Europe to prepare EPDs (environmental product declarations) for all of its main products.

2009

Environmental Management at the plant in Unterradlberg (AT) participates in the Eco-Management and Audit Scheme (EMAS). It gains ISO14001 accreditation.

EGGER obtains the PEFC and FSC® certificates group-wide.

2010

The Energy and Environmental Project in St. Johann (AT) is completed: Waste heat from the dryer supplies approx. 1400 households with heat energy.

The plants in Hexham (UK) and Radauti (RO) are certified according to ISO 14001.

2011

In constructing the office building in Radauti (RO), EGGER uses only its own wood-based materials and receives the DGNB (“Deutsche Gesellschaft für Nachhaltiges Bauen” – German Association for Sustainable Construction) certificate in gold for the new building.

With the construction method certified in Radauti, EGGER constructs the TechCenter at the site in Unterradlberg (AT) and the Forum in Brilon (DE).

2012

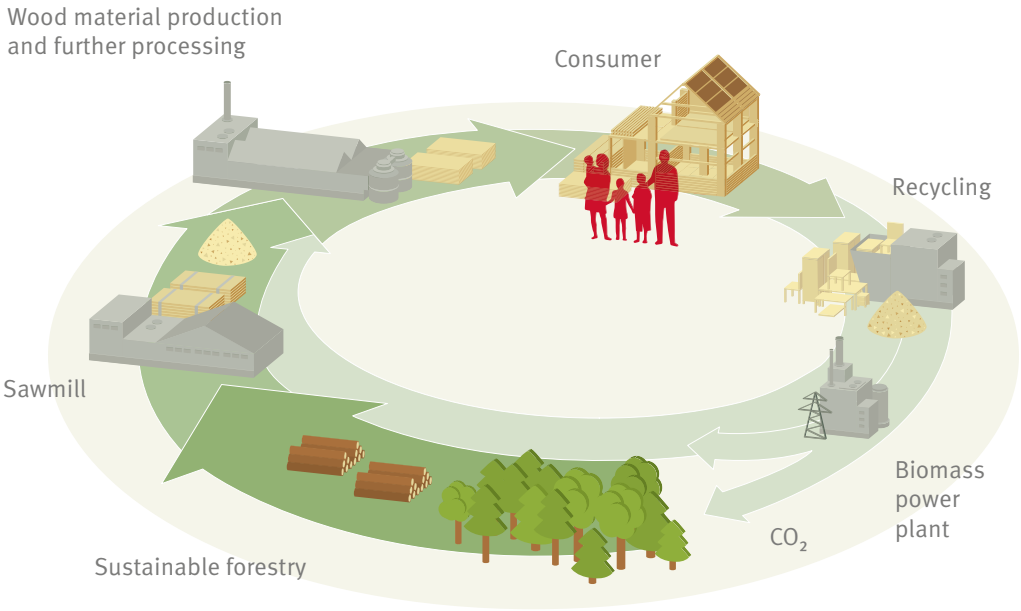
The Brilon, Wismar and Bevern plants (all DE) have ISO 50001 energy management systems.

Establishment of a central department for all product-related environmental matters.

EGGER establishes additional recycling companies in Germany, Romania and Turkey.

St. Johann in Tirol is located at the foot of the Wilder Kaiser mountains – this is where the roots of our family company run deep.

Sustainability is a Core Value



From the tree to the product – a closed cycle: EGGER emphasises the sustainable use of raw materials in its core values. Our actions focus on the closed material cycle. In doing so, we count on fully integrated plants with short transport routes. Here wood is first used in materials, from timber production in the sawmill to the production of wood-based materials. Waste and recycled wood that are not suitable for production are used to generate energy in our own biomass power plants.

EGGER takes climate change seriously. This is demonstrated by the following:

1 Most of the sawmill by-products processed into wood-based materials by EGGER at the fully integrated plant in Brilon (DE) come from the adjacent sawmill. This protects the environment by eliminating approximately 5,800 truck loads (nearly 580,000 kilometres or 360,000 miles) per year from sawmills in the region. We also operate similar operations at the Wismar (DE) and Radauti (RO) plants.

2 The use of recycled materials in EGGER products means that 1.46 million tons of CO_2 per year remain locked up in products compared to burning it.

3 Wood based material that cannot be used in products are transformed into heat and environmentally friendly electricity by EGGER in its own biomass power plants. In doing so, we eliminate approximately 690,000 tons of CO_2 emissions from fossil energy sources per year. In total, approximately three-quarters of our CO_2 emissions for energy generation come from renewable, CO_2-neutral fuels.

For details on the material cycle, visit www.egger.com/ecocycle

SUSTAINABLE

Wood is the most important raw material for EGGER. If we were to allow the destructive exploitation of forests, we would endanger our own existence over the long term. Like nature, we organise our processes in cycles that conserve resources. Wood in our homeland stands for a tradition of healthy, comfortable living spaces. As a versatile, renewable raw material, it provides us with the answers to urgent global questions of our time.

EGGER Group Management

Walter Schiegl
(Production/Technology)

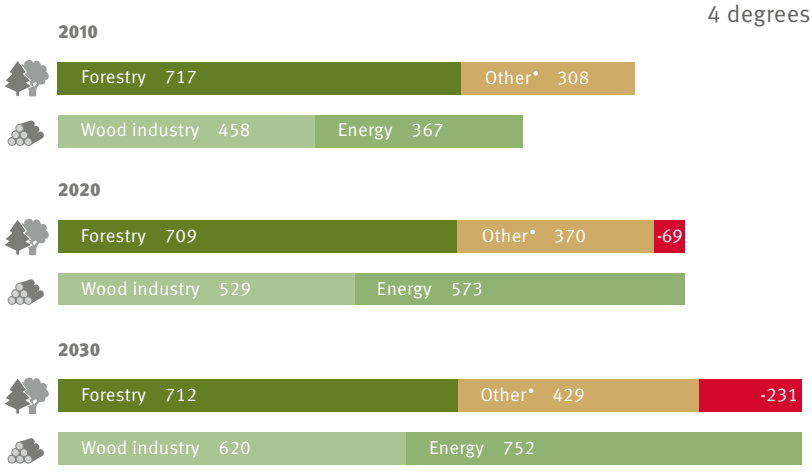
Ulrich Bühler
(Marketing/Sales)

Thomas Leissing
(Finance/Administration/Logistics)

Climate Change and Resource Scarcity

The situation: Forests stabilise the earth's climate because wood binds the greenhouse gas CO_2. But more and more branches of industry are discovering this renewable raw material as an alternative to fossil sources. Demand for wood as a construction material, raw material for paper, bioplastic and textiles as well as a renewable energy source is growing steadily.

The consequences: Studies predict a deficit of around 70 million cubic metres of wood in Europe for the year 2020 if management of the resource continues as it is today.* Furthermore, the remaining forests and oceans are no longer able to adequately absorb the CO_2 emissions that are warming the earth. Depending on the scenario, the UN Global Climate Council expects an average temperature increase of 1.8 to 4 degrees by the year 2100.**



All information in millions of m³ Raw material potential Demand
*Wood that does not come directly from harvesting, e.g. industrial and scrap wood

For more on the topic of climate change, see the following pages:
16 Storing CO_2
18 Conserving Resources
20 Recycling

Source: Udo Mantau et. al. 2010 EUwood – Real potential for changes in growth and use of EU forests. Final report. Hamburg, Germany.

* Udo Mantau et al. 2010 EUwood
** Fourth Assessment Report, (AR4) 2007, IPCC

→ EGGER supports the conservation of wood as a resource. We follow the concept of cascading use: high-quality log wood is used by us to produce timber, while sawmill by-products, wood from thinnings and recycled materials are turned into wood-based materials. We only use wood thermally if it cannot be used further in materials. Furthermore, EGGER develops technologies that permit the conservation of wood. For example, our EUROLIGHT® lightweight board requires less material than a comparable solid wood board of the same thickness.

The situation: Health is one of the major issues of our time. On the one hand, medical advancements are leading to higher life expectancy. On the other hand, people are exposed to other influences now due to the modern lifestyle as well as new materials and construction methods. An average resident of Central Europe spends 90 percent of their time indoors.*

The consequences: Allergies, sick building syndrome and MCS (multiple chemical sensitivity) as well as the effects of stress are increasing. Through reports and publications by various institutes consumers are very much aware of issues such as formaldehyde and VOCs (volatile organic compounds).

For more on the topic of healthy living spaces, see the following pages:
22 Safe Materials
24 Formaldehyde under Control
26 Compatible Surfaces

Healthy *Living Spaces*

* Federal Environment Agency of Germany, “Guideline values for indoor air”.

EGGER recognises the special qualities of wood: the homely and natural warmth it conveys. We are also aware of the growing importance of air quality in rooms, as buildings are becoming more insulated and draught free. This is why we intensively test the emissions of our products and also have them measured by independent institutes. Creating a pleasant atmosphere plays a major role in the further development of our materials and surfaces. This goes far beyond the chemical composition of the products. For example, our soft and quiet flooring with Cork+ technology and our sound-absorbing ProAcoustic elements help to create a pleasing environment, thus reducing stress.

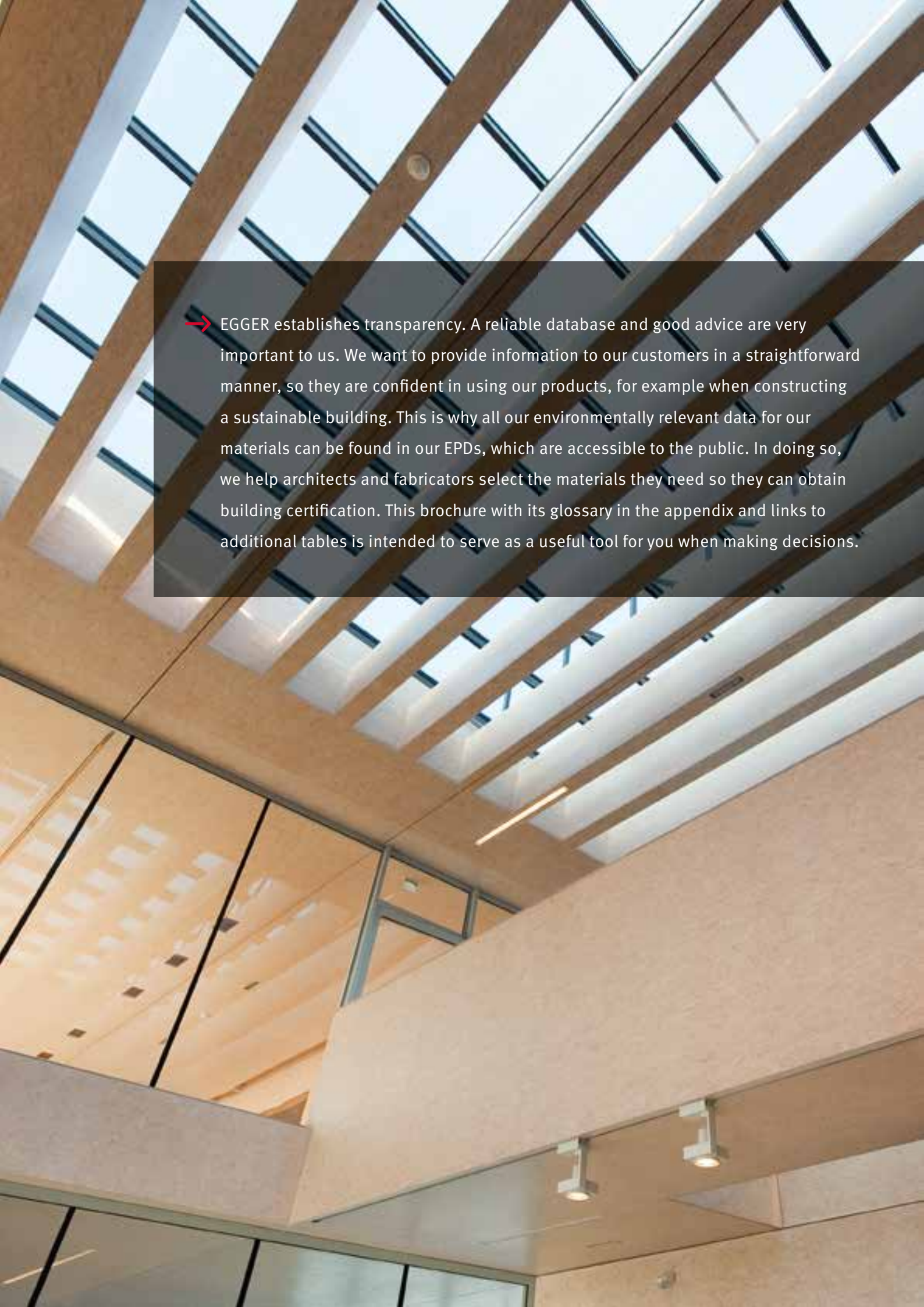
Establishing *Transparency*

The situation: What is the difference between HQE, LEED, BREEAM and DGNB? Building certification is a complex topic. Different standards and rules can apply depending on the country or region. You need to ensure a structure obtains a recognised certificate for quality criteria such as sustainability, health and energy efficiency.

The results: Builders obtain a certificate as proof that a building meets the applicable quality requirements including energy efficiency and sustainability. When purchasing real estate, this provides assurance for ongoing operation beyond the mere acquisition. Certification requires expert knowledge. EPDs (environmental product declarations) make the certification process far easier.

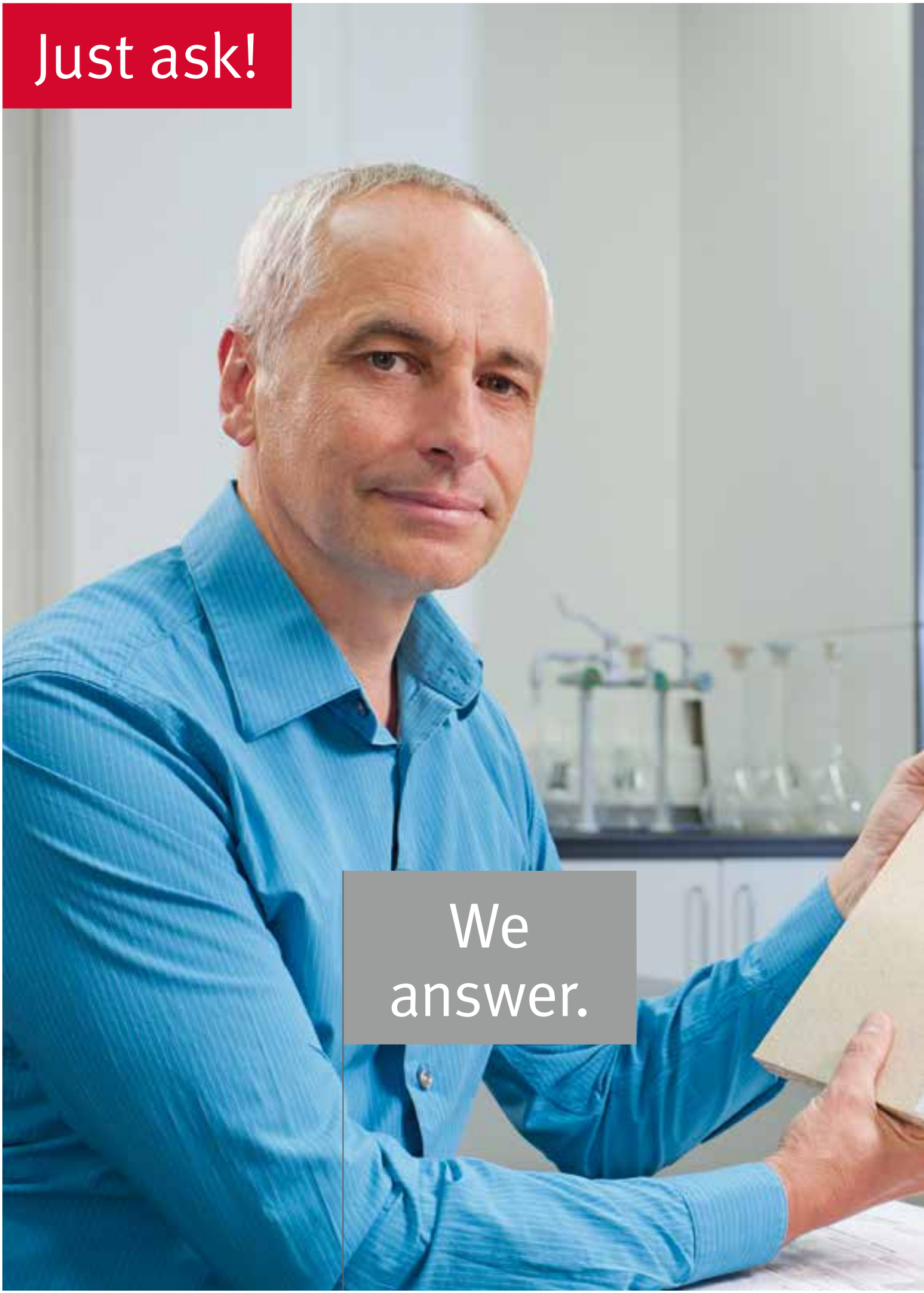
The EGGER office building in Radauti (RO) was awarded the DGNB certificate in gold for sustainability and energy efficiency.

For more on the topic of certification, see the following pages:



EGGER establishes transparency. A reliable database and good advice are very important to us. We want to provide information to our customers in a straightforward manner, so they are confident in using our products, for example when constructing a sustainable building. This is why all our environmentally relevant data for our materials can be found in our EPDs, which are accessible to the public. In doing so, we help architects and fabricators select the materials they need so they can obtain building certification. This brochure with its glossary in the appendix and links to additional tables is intended to serve as a useful tool for you when making decisions.

Just ask!



Sustainability and health are key topics for EGGER. An interview with Manfred Riepertinger, who is responsible for group-wide environmental management.

Mr. Riepertinger, why is environmental management so important for a company like EGGER?

Overall environmental understanding is increasing. End consumers want to know what products they can buy with a clear conscience. This is what our distribution partners and customers in the furniture industry, wood construction and retail are demanding from us. Sustainable production is also in our own best interest. EGGER has been dealing with the topic of sustainability since the company was founded.

The forest is an air filter, an animal habitat and a recreational area for people. At the same time it supplies the renewable raw material wood. How does EGGER contribute to make sure the capacity of our forests is not exceeded?

EGGER operates in raw material cycles, beginning with sustainable forestry and extending through the production of timber and chipboard all the way to recycling and utilising wood waste in biomass power plants. We first use wood to its full extent in our products. We therefore make a significant contribution to the conservation of resources.

How would you describe your job?

It is primarily about bringing the knowledge and expertise on environmental matters together to improve our business. This includes the ingredients we use and emissions from our products, environmental certificates and energy-efficient construction. To do this we network with our suppliers and our technicians and use the know-how from science. The relationship between sustainability and environmental compatibility plays a key role in the continuous improvement of our products as well.

Storing CO_2

“Where are greenhouse gases released when wood is used?

CO_2 is generated at several points as wood is used. The production of wood-based materials releases greenhouse gases – as by the way does the natural rotting and decomposition of unused wood. When wood is burned, CO_2 is released, which would remain locked in if the wood was used to make materials and products.

1 m³ of spruce wood binds **825 kg (1.819 lbs)** of CO_2
1 m³ of OSB board binds **864 kg (1.905 lbs)** of CO_2
1 m³ of raw chipboard binds **745 kg (1.642 lbs)** of CO_2
1 m³ of MDF board binds **505 kg (1.113 lbs)** of CO_2

Calculated from the 02/2010 EGGER EPDs based on GWP 100 production.

EGGER optimises the use of wood. Our products bind 4.05 million tons of CO_2 each year.* This corresponds to the emissions of 710,000 households.** We process the best quality log wood into sawn timber and upgrade the sawmill by-products into wood-based materials. EGGER also uses recycled wood in the production of chipboard, thereby binding 1.46 million tons of CO_2 per year. Wood that is not suitable for upgrading is transformed into environmentally friendly electricity and heat for production in our biomass power plants, eliminating approximately 690,000 tons of CO_2 from the environment compared to energy generation using natural gas.

* Determined from the global warming potential of the EGGER EPDs (in kg CO_2 equivalent, on the basis of the production figures 2011/2012).
** An average European household with four people generates approximately 5.7 tons of CO_2 per year, source: according to EUROSTAT 22/2011.

“What does sustainability mean for chipboard production?

Industrial log wood, sawmill by-products and carefully selected and pre-sorted recycled wood are all suitable for the production of chipboard. Wood that cannot be used in materials contributes to the production process as a renewable energy source.

All processes at EGGER are linked in the environmental cycle. It extends from timber production in the sawmill to the production of wood-based materials, for example for laminate flooring. Recycling returns the material that was used to the cycle. Wood that cannot be used in materials contributes to the overall process in the form of environmentally friendly heat and electricity. In order to link all our processes with short transport routes, we are developing our plants to become fully integrated sites.

ENVIRONMENTAL CYCLES

An example in Hexham (UK) reflects the EGGER culture of sustainable cycles on a small scale: our reed purification pond cleans up to 2 100 m³ of waste water per day in addition to providing a habitat for plants and animals, including frogs.

“What is the timber industry doing to combat climate change?

The use of wood in construction materials or processing into wood-based materials binds CO_2, while burning wood releases this CO_2.

EGGER is convinced that the cascading use of wood is the method of choice. This involves using wood to its full extent in materials and only using it for energy generation when it cannot be used in board production. We support the demand to establish this principle and are participating in campaigns such as the “Wood Action Day” of the European Panel Federation (EPF) and the “Stop burning our trees” campaign of the timber industry in England. This is intended to boost awareness of the sustainable use of our resources among politicians and the general public.

Conserving Resources

“What forests can be considered for raw materials?

Wood is sustainable as it is a renewable raw material. But to achieve this, sustainable forestry management is essential. This needs to accommodate economic, ecological and social aspects. The Forest Stewardship Council (FSC®) and the Programme for the Endorsement of Forest Certification Schemes (PEFC) monitor and certify sustainable supply chains.

CERTIFIED FOREST AREAS 2011 IN HECTARES

Country	Total forest area	PEFC	FSC®
Germany	11,076,000	7,395,066	544,919
France	17,572,000	4,970,110	14,248
Poland	9,337,000	4,000,734	6,979,377
Czech Republic	2,657,000	1,883,149	50,184
Great Britain	2,901,000	1,298,047	1,571,015
Austria	4,006,000	857,398	427
Italy	10,916,000	742,914	52,102
Hungary	2,029,000	0	310,281
Switzerland	1,255,274	206,083	613,262
Romania	6,733,000	0	717,056
Russia	780,000,000	177,396	30,261,983
worldwide		**245,100,000**	**162,300,000**

Sources: www.fsc.org, www.pefc.org, “Jahrbuch Wald und Holz” (Forest and Wood Yearbook) Federal Ministry for the Environment BAFU (2011), Eurostat press release 85/2011, pro Holz (www.zukunftsregion.org)

EGGER prefers to process wood from certified forests. With a strict control process (due diligence system), we monitor all wood purchases within the scope of the EUTimberReg and other forest certification systems. For raw material procurement, we obligate ourselves according to our procedure guideline not to use wood:

1. From illegal harvesting
2. Originating from regions where traditional or fundamental civil rights are violated
3. From uncertified forests which have a high protection value
4. Originating from forests that will be converted into plantations or to non-forestry uses
5. From genetically manipulated trees

In the chain of custody EGGER, depending on wood availability, is certified according to PEFC (certificate HCA-CoC-0183) and FSC® (certificate HCA-CoC-100017 and HCA-CW-100017).

“How are the suppliers monitored?

Our forests offer recreation and meet cultural, social and economic needs. Natural management ensures the preservation of woodlots. Thinning improves the composition of forests according to local conditions.

EGGER monitors compliance with its guidelines by means of so-called backwards integration. This means: we are increasingly procuring wood through our own wood buying and forestry companies. This allows us to trace the origins of the wood all the way back to the standing tree. The EGGER Group includes EGGER Forestry Ltd in Hexham (UK) and the management of forests at the plant in Gagarin (RU). EGGER Forst GmbH in Germany has been expanding its activities for purchasing standing timber since 2012, thereby harnessing regional wood reserves. In parallel to these efforts, we are integrating our suppliers into the value chain and building on long-term partnerships.

FOREST AND COC CERTIFICATION

FSC
www.fsc.org
FSC® C017963
The mark of responsible forestry

PEFC™
PEFC/04-31-0552
Promoting Sustainable Forest Management
www.pefc.org

Recycling

“What are the recycling options for wood-based materials?

Three material components are used for the production of wood-based materials: co-products, industrial log wood and recycled material. Co-products include sawmill by-products such as hackchips, cross-cuts, sawdust and wood shavings. Recycled material comes from waste wood recovered from discarded goods such as furniture, pallets or packaging materials as well as non-saleable products (rejects) from in-house production. Industrial wood is small diameter roundwood produced from sustainably managed forests.

PROPORTION OF RECYCLED MATERIAL IN EGGER PRODUCTS (AVERAGE)

Products	Co-products	Recycled material	Industrial log wood
EUROSPAN®	45 %	30 %	25 %
Thin chipboard	60 %	0 %	40 %
EUROSTRAND®	0 %	0 %	100 %
MDF/HDF	75 %	0 %	25 %
Thin MDF	100 %	0 %	0 %

EGGER ensures that prepared recycled material is purchased from qualified disposal specialists. A return system for board trimmings was also implemented with some customers.
We process suitable recycled wood for use in chipboard production. It accounts for an average of 30 percent. The company purchases fresh industrial log wood to produce the strands for OSB production. Large volumes of by-products and recyclable wood are generated by the plants. EGGER upgrades them into materials or uses them to generate environmentally friendly heat and electricity.

“Can contaminated scrap wood be processed into wood-based materials as well?

Due to impregnation and coatings, recycled wood may contain heavy metals or the organic chlorine compound PCP which is prohibited today. Manufacturers have to implement careful sorting practices in order to ensure that only recycled wood which is not contaminated is used in materials.

EGGER only processes recycled wood from furniture, pallets, wooden packaging materials, construction and demolition that meets the requirements of the applicable directives and inspection systems. The material is also inspected visually at our plants and contaminated wood is separated for thermal use. EGGER conducts analyses for PCP/Lindane and also lead. We provide a comprehensive service and provide legal certainty for suppliers in the disposal of their waste wood. In addition to organising transportation, we are an experienced partner when dealing with notification proceedings abroad.

“How can 100 per cent of a tree be utilised?

AS STURDY AS SOLID WOOD

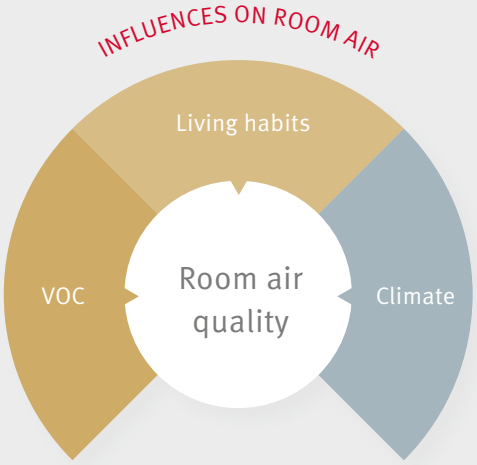
EGGER invests in resource conservation technology and includes recycling in the process. For example, a honeycomb core made of recycled paper between thin layers of chipboard or MDF board stabilises the EUROLIGHT® lightweight board.

A closed raw material cycle maximises the use of wood in materials and as an energy source. All parts of the tree – log wood, branches and bark – can be fully utilised by a manufacturer of wood-based materials. Only the roots are not used and remain in the ground.

EGGER uses the potential of wood to its best possible advantage. Using wood in materials takes precedence: sawmill by-products, windfall wood, wood from forest thinning and recycled wood can be upgraded into wood-based materials. Dust generated through wood processing is used instead of fossil energy sources to generate heat and environmentally friendly electricity. We supply district heating to local areas from our energy plants.

Safe Materials

“What are VOCs?



In addition to VOCs from products and installed materials, room air quality also depends on living habits and the climate.

VOCs (volatile organic compounds) affect room air quality. They include natural substances in wood that are responsible for its characteristic odour. Various VOC sources affect room air quality in modern living spaces. Here wood and organically bound wood-based materials are among the influences perceived as positive today.**

EGGER has the VOCs in its products tested regularly according to the latest standards, even though the emissions are not hazardous to health. Studies show that wood-based materials do not damage lung tissue, even at high VOC concentrations.* The naturally occurring aldehydes and carboxylic acids in wood are harmless as well.**

* Freiburg University and Fraunhofer Institute for Wood Research WKI, Braunschweig, 2009.
** “Bauen und Leben mit Holz” (Building and Living with Wood), Publisher: Informationsdienst Holz.

“How are VOCs in wood-based materials different from those in wood?

Wood and wood-based materials are largely similar in their VOC emission behaviour. Since wood-based materials are pressed at high temperatures of up to 200 °C, aldehydes and carboxylic acids that release non-volatile or not highly volatile components of wood can increase. Subsequently applied waxes, adhesives and coatings on treated wood can also be VOC sources.

EGGER is continuously reducing the use of chemical agents. As the bonding and pressing processes have been technically refined during the past 20 years, much lower volumes of glue are now used.

“Do wood-based material manufacturers have to test for VOCs in their products?

Test chambers with a volume of 1 m³ at Fraunhofer Institute WKI.

The testing and evaluation methods vary according to the product group. In some countries, information on the release of VOCs is mandatory for flooring, construction products and decorative interior design products. Various methods apply for the qualitative and quantitative evaluation of different VOCs. The so-called LCI (Lowest concentration of interest) values that quantify possible health effects serve as a reference.

EGGER also has its products that are not subject to mandatory testing evaluated by independent institutes. We also invest in modern test chambers, both for internal monitoring and for product development and optimisation. In doing so, EGGER collects its knowledge in this field. We can use the test chambers to measure VOC as well as formaldehyde emissions.

“What is the effect of VOCs from wood-based materials on humans?

Scientists have collected reliable data proving that VOCs from wood-based materials do not represent a health hazard. Even with VOC concentrations 5 to 50 times higher than commonly accepted guidelines, test subjects in the test chambers neither exhibited impaired lung function or inflammatory reactions, nor did they experience symptoms such as irritation of the eyes and mucous membranes, headaches, nausea, dizziness or feeling ill.*

EGGER traditionally relies on wood to create cosy living spaces. In the company’s home of Tirol, wood construction is part of a well-established lifestyle and where the scent of resin is part of the natural environment. The emissions from certain types of wood are considered revitalising, having a positive effect on health and general wellbeing.

* Freiburg University and Fraunhofer WKI Braunschweig, 2009.

“How much formaldehyde is in wood-based materials?

Formaldehyde occurs naturally in wood at a steady-state concentration below 0.01 ppm (parts per million). In glue for wood-based materials, such as urea, melamine and phenolic resins, formaldehyde has been reduced as much as possible. Formaldehyde is even needed to produce the formaldehyde-free glue PMDI (isocyanate/PU).

EGGER works against trivialising the risks of formaldehyde, supporting and shaping both national and international processes that deal with the topic of formaldehyde and air quality in buildings. All EGGER products fall below the limits for the European formaldehyde class E1. Some even meet the stricter requirements of voluntary guidelines or national laws, such as those in the USA and Japan.

Formaldehyde under Control

OVERVIEW OF LIMITS FOR RAWBOARD

Emission classes	E1		EPF-S	CARB 2		IOS-MAT 0003		F****	
Test method	European Chamber test according to EN 717 (ppm)	Perforator according to EN 120 (mg HCHO/ 100 g ATRO (absolutely dry) board)***	Perforator according to EN 120 (mg HCHO/ 100 g ATRO (absolutely dry) board)	American chamber test according to ASTM 13333 E (ppm)*	Comparative value, European chamber test according to EN 717 (ppm)**	ASTM 1333 E (ppm)	Perforator according to EN 120 (mg HCHO/ 100 g ATRO (absolutely dry) board)***	Desiccator according to JIS A 1460 (mg/l)	Comparative value, European chamber test according to EN 717 (ppm)
Chipboard	0.1	max. 8	max. 4	0.09	0.065	0.09	max. 4	0.3	0.03 – 0.04
Thin MDF	0.1	max. 8	max. 5	0.13	0.14	0.13	max. 5	–	–
MDF	0.1	max. 8	max. 5	0.11	0.12	0.11	max. 5	–	–
OSB	0.1	max. 8	–	–	–	0.09	max. 4	0.3	–

* Chamber method: min. 23 m³, tests with various degrees of loading, temperature: 23 °C, relative humidity: 50 %, air exchange rate: 0.5/hour
** European chamber method: uniform degree of loading, temperature: 23 °C, relative humidity: 45 %, air exchange rate: 1/hour
*** For production control at the plant

“Are there wood-based materials without formaldehyde?

According to estimates by the Fraunhofer Institute, 80 to 85 percent of all chipboard today contains glue with formaldehyde. Manufacturers have been able to reduce emissions tremendously over the past 20 years and experts expect a further decrease. Technically mature, formaldehyde-free glues such as polymeric diphenylmethane diisocyanate (PMDI), available in limited quantities, require elaborate processing for occupational safety and therefore lead to higher consumer prices.

EGGER also produces formaldehyde-free rawboard which is usually classified under the E0 standard: EUROSTRAND® OSB 4 Top as well as the EGGER DHF board, which is made with polyurea. These are intended for areas of application where products with coatings that inhibit emissions are not suitable.

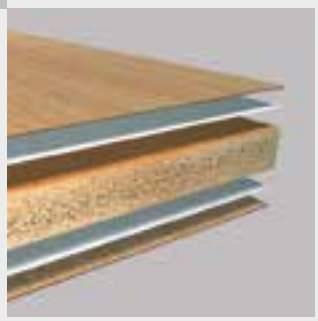
“How much formaldehyde in wood-based materials is hazardous?

0.1 ppm of formaldehyde complies with the E1 standard commonly accepted in Europe. The World Health Organisation (WHO) has confirmed this benchmark as a safe level, based on its risk evaluation in 2010. Therefore, all products which comply with the value 0.1 ppm are classified as safe by today’s knowledge.

EGGER offers products below the required limits for all of the standards mentioned above. With emission values below 0.05 ppm, DHF and flooring products meet the requirements of the “Blue Angel” environmental seal. With a formaldehyde emission concentration of less than 0.03 ppm, the melamine faced EURODEKOR® board is on the product list of the Swiss Lignum. As a supplier to IKEA suppliers, we also produce rawboard that meets the CARB-2 standard.

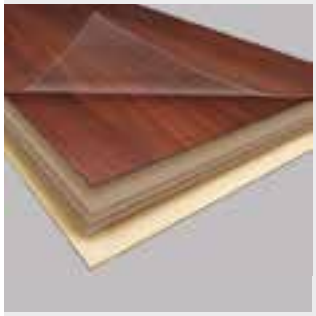
Compatible Surfaces

Composition of a coated Cork+ floor



Melamine faced EURODEKOR® board

“What surfaces are available on wood-based materials?



Composition of EGGER laminate

Wood-based materials are usually upgraded with melamine resin surfaces, laquer and laminate. Melamine resin coatings on various coreboards dominate these. They consist of one or more layers of impregnated decorative paper that is applied to the board. In contrast, several core paper impregnated with phenolic resins are added for laminates. An overlay also protects the surface of some products. The composition of the coatings determines their durability, appearance and feel.

The melamine faced, decorative wood-based material EURODEKOR® is among EGGER’s bestselling products. Similar to a laminate, this is a fully cured coating system. That means: no excess free formaldehyde is left after production. As a result there are also no emissions.

“Are there emissions from coatings and resins?

Melamine resin surfaces, laminates and most coatings are fully cured systems. Their own emissions are very low. They also block emissions from the coreboard, so that the laminated board exhibits far lower values for VOC and formaldehyde emissions compared to the rawboard. Some exceptions apply to coatings, for example with azoic dyes that may be harmful to health.

EGGER does not use any azoic dyes and neither do its suppliers of printed decorative papers. Only azoic pigments are used in the papers, for coatings and the direct printing of rawboards. Unlike azoic dyes, these are insoluble in the application medium. This means the pigments are not absorbed, making them harmless. Today they have been proven in printing inks, synthetic materials, coatings and food packaging.

CORK+ TECHNOLOGY

Cork is a renewable and therefore environmentally friendly raw material. Millions of air pockets make flooring out of leftovers from the cork industry warm, soft and quiet. EGGER applies the decor image for the Cork+ series with direct print technology (DPR®) in environmentally friendly, elastic coatings directly onto the cork layer. The flooring is sturdy and also easy to process.

“Where does the paper for lamination come from?

A large quantity of paper is processed into laminates, the impregnated papers for melamine resin and flooring coatings. Wood is the raw material. As a result, the responsible use of resources and the paper procurement method are both important.

Rolls of paper for processing into decors at EGGER

Virtually all paper processed by EGGER is made using wood from sustainable forestry. Most of the raw materials are FSC® or PEFC-certified. We keep transport routes as short as possible when choosing our sources of supply.

Disclosing Performance

What is an EPD?

EPD stands for environmental product declaration. In this document, the manufacturer presents all environmentally relevant information for a material, including a description of the product and its manufacturing process. An independent committee of experts verifies and confirms the information. EPDs are reliable tools for certifying the environmental performance of construction projects.

EGGER was Europe's first wood-based material manufacturer to disclose the environmental performance of its wood-based materials in independently verified EPDs. Today EPDs are available for all major EGGER products: MDF and HDF boards, the EUROSPAN® and EURODEKOR® products, timber, DHF, EUROLIGHT®, laminate and OSB as well as DPL and DPR® flooring.

What is the purpose of an EPD?

An environmental product declaration allows builders, architects and fabricators to determine the environmental impact of materials and process steps. This gives them greater clarity and control when comparing alternatives based on ecological, economical and socio-cultural criteria. With their performance figures, EPDs identify ecological product design and permit the declaration of environmental indicators.*

EGGER was the first wood-based material manufacturer in Europe to prepare EPDs for its products, making a contribution towards sustainable construction and living. The EPDs are issued by renowned programme owners and cover all performance figures commonly required by building certification systems.

*Source: PE International

“What performance figures are included in an EPD?

Since 2011, the European EN 15804 standard which applies across Europe has specified the calculation methodology, development of scenarios for construction, usage, disposal and recycling processes and the indicators to be evaluated for environmental product declarations. At the heart of every EPD is the life cycle assessment, which is based on the lifecycle of a product. An EPD identifies abiotic resource consumption for elements such as minerals and ores, the consumption of primary energy and the global warming potential as well as the so-called human toxicity and terrestrial environmental toxicity potential.*

EGGER always keeps its EPDs up to date. This means our documents comply with the new ECO Standard beginning in 2013. The programme owner for our EPDs is the renowned German Institut für Bauen und Umwelt (Institute for Construction and the Environment) (IBU). EGGER makes the EPDs accessible to the public via central databases and on the Internet under www.egger.com.

* Source: PE International

Life Cycle Assessment Overview

“What is the purpose of the life cycle assessment?

The life cycle assessment (LCA) determines the environmental impact of products. In principle it can model all phases of the lifecycle, from the production of a product through recycling to disposal. The sum of the required resources and emissions (“life cycle inventory analysis”) can be converted into indicators for a comprehensive impact assessment today. The ISO 14040 and ISO 14044 series of standards govern the performance of a life cycle assessment study.

With EGGER wood-based materials, we are documenting the positive life cycle assessment of the raw material wood. For example, a single-family dwelling in wood construction can store up to 80 tons of CO_2. This is complemented by the substitution effect of wood in place of other raw materials. For example, the production of aluminium requires one hundred times as much energy compared to structural timber.

“What potential impacts does a life cycle assessment reveal?

A life cycle assessment determines the global warming potential (GWP), use of primary energy, ozone depletion potential (ODP), acidification potential (AP), nutrification potential (NP) and photochemical oxidant creation potential (POCP). The potential impact of the product on climate change is related to CO_2 and specified in carbon dioxide equivalents (CO_2 equivalents). For example, the global warming potential of a running metre of wood frame interior wall is equivalent to 97 kg of CO_2. In comparison: the GWP for a metal frame wall is 136 kg, with 488 kg for a solid wall.*

GLOBAL WARMING POTENTIAL IN KG OF CO_2- EQUIVALENTS

	Wood frame wall	Metal frame wall	Solid wall
Construction and maintenance	198	199	445
CO_2 bound in woods	-238	-9	–
Disposal (emitted)	250	7	43
Disposal (electricity & steam credit and/or recycling potential)	-114	-62	–
Total potential	**97**	**136**	**488**

EGGER wood-based materials constitute an environmentally friendly alternative to many materials. Compared to concrete, brick and metals, wood does significantly better in regards to key performance figures such as primary energy consumption and global warming potential.

*Source (also graphic): Project “ÖkoPot”, UV Hamburg 2008.

“What role does the use of energy play in the life cycle assessment?

The life cycle assessment study for a product captures the so-called consumption of primary energy in megajoules (MJ). In contrast to secondary energy, this is the energy that can be used without conversion. LCAs provide proof of the demand for primary energy from renewable energy sources such as wind and hydro, solar energy and biomass as well as non-renewable energy sources such as coal, natural gas and oil.

EGGER counts on renewable energy sources. Example: the proportion of primary energy that comes from renewable energy sources in our biomass power plants is three times as high for the production of EUROSTRAND® OSB board as the proportion of energy from non-renewable energy sources.

“Why is the certification of sustainable construction methods important?

A certificate that documents the sustainability of a building in terms of construction and operation contributes to maintaining its value. Both EPDs according to EN 15804 and life cycle assessments for buildings are still voluntary today. However, invitations to tender are frequently requiring EPDs for building materials.

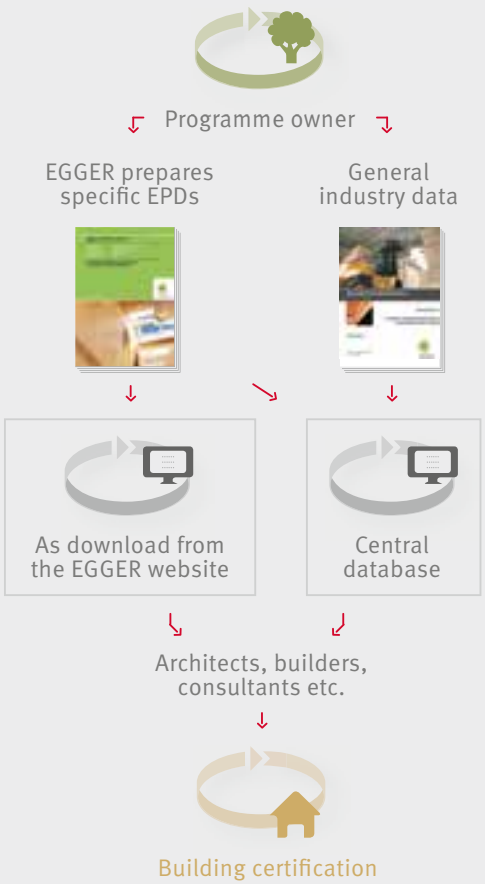
EGGER emphasises certified sustainability for its own construction projects as well. For the new construction of our office building in Radauti (RO), we used only our own wood-based materials and received the DGNB certificate in gold (“Deutsche Gesellschaft für Nachhaltiges Bauen” – German Sustainable Building Council). The EGGER Tech-Center in Unterradlberg (AT) and the new Forum at the plant in Brilon (DE) were constructed using the same method.

Adding Value with Certificates

How do certified construction materials contribute to building certification?

There are many aspects to the requirements for certifying a building, including life cycle assessments for the building materials used. Architects and planners can research industry-wide averages in public databases such as Ökobau.dat and ESUCO (European Sustainable Construction Database), which is currently being set up. Innovative manufacturers also publish their EPDs here. They allow the sustainability of a building to be determined more reliably.

BUILDING CERTIFICATION PROCESS



EGGER is a leader in terms of transparency: we supply all of the performance figures required for building certification under various certification systems. In doing so, we take into account that scientifically substantiated life cycle assessments have developed to become the standard today. Our EPDs issued by the Institut für Bauen und Umwelt (Institute Construction and Environment) (IBU) are accessible in public databases and can be downloaded from our website.

What certificates are available?

The certification systems differ according to the programme owner and regional predominance. Established certification systems include the “Deutsche Gesellschaft für Nachhaltiges Bauen” (German Sustainable Building Council) (DGNB), the American Leadership in Energy and Environmental Design (LEED), the British Building Research Establishment Environmental Assessment Method (BREEAM) and the French Haute Qualité Environnementale (HQE).

EGGER provides EPDs for all of its products, including the performance figures for all catalogues of requirements according to the various certification systems. Politicians indicate that a uniform European basis for evaluating the environmental impact of buildings can be expected in the next few years.

EGGER *Glossary*

A

AGBB → The “Ausschuss zur gesundheitlichen Bewertung von Bauprodukten” (Committee for Health-related Evaluation of Building Products) in Germany consists of representatives from the state health authorities, the Federal Environment Agency, the “Deutsches Institut für Bautechnik” (DIBt), the “Bauministerkonferenz” (Conference of the Ministers of Buildung), the “Bundesanstalt für Materialforschung und –prüfung” (Federal Institute for Material Research and Testing), the “Bundesinstitut für Risikobewertung” (Federal Institute for Risk Assessment) and the “Koordinierungsausschuss 03 für Hygiene, Gesundheit und Umweltschutz” (Coordination Committee 03 for Hygiene, Health and the Environment) of the “Normenausschuss Bauwesen” (The Building and Civil Engineering Standards Committee). In 2001 it developed an approach for the health assessment of → **VOC** emissions from building products used on the interior of buildings. ■

ALTHOLZVERORDNUNG → The German Altholzverordnung (Waste Wood Ordinance) regulates the recycling and disposal of scrap wood in Germany. Scrap wood refers to industrial wood waste and used wood. The directive classifies scrap wood into various categories (A I – IV and PCB scrap wood). This is important for the decision to recycle or dispose of the wood. ■

ATCM → Airborne toxic control measure. See → **CARB-2**. ■

B

BAUBOOK → See appendix: Comparison of Certification Systems. ■

BIOMASS → Mix of substances bound in living organisms and/or generated by them. Its scope is determined by its mass. Biomass is frequently recorded for select, geographically clearly defined ecosystems only. Otherwise it is determined only for specific, individual populations. There is no uniform definition of biomass in ecology. However, two perspectives are used for differentiation: ecological biomass (estimated mass of organisms per volume) and energetic biomass. The latter is limited exclusively to animal and plant products that can be used to generate energy. ■

"BLAUER ENGEL" (BLUE ANGEL) → See appendix: Comparison of Certification Systems. ■

BREEAM → See appendix: Comparison of Certification Systems. ■

C

CARB-2 → The California Air Resources Board (CARB) released a measure in 2007 to control harmful substances in air (Airborne Toxic Control Measure: ATCM), including guidelines for the formaldehyde emissions of wood-based materials. These regulations are binding for all manufacturers, importers, fabricators, distributors and certification authorities working with wood-based material products for the Californian market. ■

CARCINOGENICITY → Describes the ability of chemical substances to cause cancer or promote the formation of cancer. ■

CASBEE → The CASBEE certificate was developed in 2001 by the Japan Sustainable Building Consortium (JSBC). It measures the environmental efficiency of buildings and is tailored to meet the special requirements of real estate in Japan and Asia. The CASBEE system consists of four different evaluation criteria for the lifecycle of a building from the design and construction through operation and renovation to demolition. This evaluation system can be applied to various types of use – office buildings, schools, residential etc. It is based on the same principle as → **BREEAM** and → **LEED**. ■

CASCADING USE → Use of a raw material through several stages, striving for the most sustainable and effective use while reducing the consumption of raw materials. Raw materials or the products made from them are used in the economic system as long as possible. As a rule, a usage cascade permits the use in materials one or more times with decreasing added value, as well as a final energy use or composting of the raw material. Due to their "hierarchical" structure, renewable raw materials in particular are excellent for multiple use since they offer the unique advantage that stored carbon dioxide remains in circulation for a long time before it is released back into the environment. ■

CE CONFORMITY → The CE marking documents the conformity of a product with the requirements of the applicable standards and approvals in Europe. Wood-based materials for use in the building trade in Europe are governed by the harmonised EN 13986 standard in regards to essential characteristics, test procedures to determine these characteristics and labelling. The process for evaluating conformity is also described. This serves to prove that the wood-based materials meet the applicable requirements. ■

CHAIN-OF-CUSTODY → Certifying the chain of custody ensures that the sources of raw materials and the flow of materials, from purchasing the raw products to selling the end products, are consistently documented and monitored. This verification process has long since been used for highly sensitive products (e.g. medicine). In the timber industry, forest industry operations and their independent testing and certification assure a documented flow of wood. For the end consumer, this provides the required certainty that wood used in the product comes from sustainable forestry. ■

CHAMBER TEST → Method to determine the formaldehyde emissions of wood-based materials and their products under defined conditions (temperature, relative humidity, air exchange rate, air speed and room loading). The sample is surrounded by room air on all sides in the chamber. Formaldehyde emitted during the test is absorbed by periodically distilled water and then subjected to a quantitative analysis. The test is governed by the European DIN EN 717-1 standard as well as the American measuring standards ASTM E 1333 and D 6007. ■

CHIPBOARD → The most important product by volume among wood-based materials, chipboard is usually produced on continuous lines. It is made from wood chips and binding agents. Chipboard is usually composed of three layers. The core layer with somewhat larger chips provides strength while the surface layers with finer chips form a smooth and cohesive surface. ■

CO_2 → Carbon dioxide is an acidic, non-combustible, colourless and odourless, chemically relatively inert gas emitted during the combustion of organic substances and partly responsible for the greenhouse effect in the atmosphere. ■

CO_2 FOOTPRINT → The CO_2 footprint (also known as the carbon footprint or CO_2 balance) measures the total greenhouse gas emissions generated directly and indirectly by an activity or during the lifecycle of a product. All → **EMISSIONS** that contribute to the greenhouse effect are converted into carbon dioxide equivalents. Calculating the carbon footprint was first defined at the beginning of 2012 by the ISO 14067 preliminary draft. It can also be obtained from the life cycle assessment for a product. ■

CO-PRODUCT → A co-product is a by-product or joint product. It is a material that is produced during the initial processing of log wood along with another (primary) product from the same raw material (e.g. hackchips, sawdust or edgings). In the sawmill sector, one also speaks of sawmill by-products. ■

CO_2-STORE → Substances capable of temporarily or permanently absorbing and storing carbon. In principle, all biomass is capable of storing CO_2. Forests are major carbon sinks because trees absorb large quantities of carbon from the air and store it in wood. However, the oceans are the largest CO_2 stores by far. ■

CONTROLLED WOOD → Operations producing → **FSC®**-certified products are permitted to also process a small proportion of wood from non-certified forests. In order to exclude the possibility of mixing wood from controversial sources into FSC®-certified products, the FSC® demanded a certificate of origin with accompanying risk assessment for these non-FSC®-certified components. If the risk is low, this wood can be used in the production of FSC® products as controlled wood (CW). When material comes from a region where the risk is unclear, elaborate case-by-case inspections in the forest are required. A risk analysis developed by FSC® has been in force since 1 August 2011 and must be used in FSC®-certified operations. ■

D

DESICCATOR → Also: exsiccator. A test apparatus to determine the formaldehyde emissions of wood-based materials. Preconditioned specimens are stored at a constant temperature in an exsiccator that contains a bowl of distilled water. The formaldehyde emitted by the samples is absorbed by the water during a 24-hour test period and then subjected to a quantitative analysis. The test is described in the Japanese JIS A 1460 standard. ■

DGNB → See appendix: Comparison of Certification Systems. ■

E

E1 → The harmonised EN 13986 standard regulates requirements for the use of wood-based materials in the building trade as well as emission class E1. In Annex B of the standard, formaldehyde emission class E1 defines a formaldehyde emission limit of 0.124 mg/m³ air (0.1 ppm) in a chamber test according to EN 717-1. ■

E1-PLUS → The European Standard Committee CEN/TC 112 is currently discussing the introduction of a new emission class E1-plus with a formaldehyde emission limit of 0.080 mg/m³ air (0.065 ppm) in a chamber test according to EN 717-1. ■

EMAS → Eco-Management and Audit Scheme, the European environmental management system. Participation by all organisations in private industry and the public sector is voluntary. Continuously improving environmental protection by operations through the conservation and efficient use of resources is the objective. With the help of EMAS, ecological and economical weaknesses in organisations can be eliminated in addition to saving material and energy, thereby reducing costs. ■

EMISSION → The discharge or output of harmful substances into the environment. In particular, → **FORMALDEHYDE** from binding agents applies to wood-based materials, but also volatile organic compounds (→ **VOC**s) that come from the wood itself (e.g. terpene). ■

EPD → An environmental product declaration (EPD) provides quantified environmental information for the lifecycle of a product or service. Independently verified data for the respective product are presented in the form of a lifecycle inventory analysis with input and output flows. An EPD is a type III declaration according to ISO 14025. This standard aimed at trades, distributors and end users establishes that an EPD has to present quantitative information about environmental effects without evaluation based on a life cycle assessment. The standard also establishes that a valid EPD has to be made accessible to the public via a programme operator. Several operators are now offering EPDs. ■

EUROBLUME → See appendix: Comparison of Certification Systems. ■

EU TIMBER REG → Timber Regulation, an EU wood distribution directive (in detail: European Commission Regulation (EU) No. 607/2012 of 6 July 2012), regulating the origins of wood in parallel to FSC® and PEFC. The EUTimberReg requires market participants that first bring wood or wood products into circulation to develop and apply rules for the duty of care. The purpose of the regulation is to ensure, subject to various evaluation principles, that the wood or wood products in question do not come from illegal harvesting or critical sources. ■

EXSICCATOR → **DESICCATOR**. ■

F

F**** → A formaldehyde emission class issued by the Japanese Ministry for Land, Infrastructure, Transport and Tourism in 2003 as a new regulation for classifying building products according to their formaldehyde emissions. Products with formaldehyde emissions below 0.005 mg/m² h or 0.3 mg/l comply with F**** and are not subject to any usage restrictions in Japan. ■

FORMALDEHYDE → Colourless gas with a pungent odour, can be released for example in the hydrolysis of urea-formaldehyde resins. Formaldehyde can cause allergies as well as skin, respiratory tract or eye irritation in humans. It may be carcinogenic with long-term exposure. ■

FSC® → The Forest Stewardship Council was founded in 1993 as an international organisation and is supported by environmental associations such as the WWF, woodlot owners, the timber industry, unions and indigenous peoples to help control the destructive exploitation of forests. The FSC® is independent and does not pursue any financial interests. Its objective is to identify wood from socially and environmentally friendly forestry with a seal of approval. In order to guarantee this, independent experts inspect wood annually within the scope of certification. ■

G

GREENHOUSE GAS → Radiant energy from the sun is not fully reflected back into space due to gaseous substances in the atmosphere (greenhouse gases), allowing a habitable climate to develop on the surface of the earth. A disruption of this natural greenhouse effect is causing climate warming and is largely attributed to human activity. With the Kyoto Protocol, a binding accord under international law was concluded to reduce the man-made emission of major greenhouse gases. ■

GREY ENERGY → The amount of energy required for the production, transportation, storage, sale and disposal of a product, including the upstream chains up to providing the raw materials. It also includes the energy required to produce resources required for the production of a product (machines, infrastructure etc.). Grey energy therefore represents the actual, total energy demand for the production of consumer goods. On the other hand, energy required for the use of a product is not included in grey energy. ■

H

HONEYCOMB BOARD → Three-layer composite board consisting of a honeycomb core and two surface layers. In the wood-based material industry, the core layer usually consists of a cardboard honeycomb core while the surface layers are made of various wood-based materials. Honeycomb boards offer very high strength relative to their weight thanks to their sandwich structure, and are used mainly in lightweight construction. ■

HQE → The French system for optimising the ecological quality of structures – Haute Qualité Environnementale (HQE) – was first tested in 1994 and has been in use since 1997. HQE certification covers three phases: ordering, design and execution. Audits are performed at the end of the three phases. Here the focus is on two aspects: the ecological management of construction projects and sustainable building design. To obtain the HQE certificate, at least 30 out of 110 points must be obtained in 14 categories. Mandatory categories include freedom from harmful substances, energy management and water efficiency. Here at least 19 out of 45 points have to be awarded. From the remaining categories, the builder can select those that best correspond to the profile of the building and the usage requirements. ■

I

IBU → The "Institut für Bauen und Umwelt" (Institute Construction and Environment) is an initiative of building product manufacturers that have decided to join forces in order to meet demand for greater sustainability in the building trade. As a recognised programme operator in Germany, the IBU prepares and publishes EPDs for the construction sector in accordance with ISO 14025. Motives include promoting interest in the topic and the conviction that sustainability is a valid approach. Developing new competencies in view of the growing market is important to IBU members. Both the general public and users can access this information first hand (www.bau-umwelt.com). ■

IMPREGNATED PAPER → In the wood-based material industry, impregnated paper is decorative, uni colour or white paper soaked with → **UF**, **MF** or **PF** resin and dried. It is subsequently used for the lamination process or the production of laminates. ■

INDOOR AIR QUALITY → Also: room air quality. As early as the 90s, national and international committees were examining questions related to the precise evaluation of → **VOC**-emissions from building products to improve air quality in enclosed rooms. ■

IOS MAT IKEA → environmental standards. This IKEA certification system applies among other things to monitoring laminated and uncoated wood-based materials in regards to relevant harmful substances (such as → **FORMALDEHYDE**, → **PCP** and → **LINDANE**) as well as the manufacturing process. ■

IWAY → Also: The IKEA Way. The IKEA code of conduct excludes products made with child and forced labour, and requires safe, healthy work conditions, compliance with local laws and the responsible use of chemicals. ■

L

LCA/LIFE CYCLE ASSESSMENT → A life cycle assessment is a systematic analysis of the environmental impact of products during the entire lifecycle (from cradle to grave) or up to a certain stage of processing (from cradle to factory gate). The analysis includes all environmental effects during production, the usage phase and disposal of the product as well as the associated upstream and downstream processes (e.g. production of the raw materials, auxiliary materials and supplies). All ecologically

relevant environmental extracts (e.g. ore, crude oil) as well as emissions to the environment (e.g. waste, carbon dioxide) are captured and converted to their environmental impact potential. The life cycle assessment is essential for the preparation of EPDs. ■

LCI VALUE → Evaluation under the → **AGBB** scheme is based on the so-called LCI value (lowest concentration of interest). A list of LCI values for various substances is found in the appendix to the AgBB scheme. The LCI values are derived from the workplace concentration limits. ■

LEED → See appendix: Comparison of Certification Systems. ■

LIGNUM → See : Comparison of Certification Systems. ■

LINDANE → **PCP**. ■

M

MATERIAL CYCLE → A closed material cycle (closed loop system) strives to use all wastes and by-products from production as efficiently as possible on the one hand and, on the other hand, to once again make materials used in products available for production at the end of the product lifecycle through optimum recycling. The possibility of a closed material cycle should be taken into account even during the preliminary stage of product planning in conjunction with product design. ■

MDF → Medium density fibreboard, wood fibre materials produced using a dry process. Fresh wood fibres and binding agents form the basis. ■

MFC → Melamine faced chipboard produced using short cycle lamination lines, made of impregnated papers with wood-based materials as the coreboard. ■

MINERGIE ECO → See appendix: Comparison of Certification Systems. ■

N

NORDIC SWAN → See appendix: Comparison of Certification Systems. ■

O

ÖSTERREICHISCHE UMWELTZEICHEN → See appendix: Comparison of Certification Systems. ■

OSB → Oriented strand board, a wood-based material made of directional, long, thin chips (strands). OSB boards are mainly used in construction. ■

P

P1 TO P7 BOARDS → Classification of the area of application for chipboard according to mechanical properties and moisture resistance. P1: for general applications in dry conditions, P2: for interior fixtures in dry conditions, P3: for non-load-bearing applications in humid conditions, P4: for load-bearing applications in dry conditions, P5: for load-bearing applications in humid conditions, P6: for high load-bearing applications in dry conditions and P7: for high load-bearing applications in humid conditions. ■

PAH → Polycyclic aromatic hydrocarbons, an umbrella term for aromatic compounds with condensing aromatic ring systems; some of these substances are carcinogenic. Among other things, they result form the incomplete combustion of organic materials; however, they are also natural components of coal and crude oil. When crude oil is distilled, they accumulate in bitumen which was used until the end of the 90s for impregnating wood products such as railroad ties or posts to protect them against weathering. ■

PCP/LINDANE → Pentachlorophenol/hexachlorocyclohexane, the most popular wood preservatives in the 60s to the 80s of the past century, also used as insecticides (especially Lindane). Persons exposed to PCP/Lindane for extended periods of time exhibit symptoms such as headaches, nausea, breathing difficulties, sleep disturbances, fatigue, irritation of the skin and mucous membranes, liver problems and immune system weakness. These symptoms were also collectively described as “wood preservative syndrome”. ■

PEFC → The Programme for the Endorsement of Forest Certification Schemes (PEFC) is an international forest certification system. It is the world’s largest organisation for ensuring and continuously improving sustainable forestry while guaranteeing compliance with ecological, social and economic standards. To ensure that small family forestry operations could obtain certification, PEFC chose a regional approach based on local workgroups and forestry reports. Forestry operations in the respective region are audited on a sampling basis at regular intervals. At the same time, the new objectives for the continuous improvement of sustainable forest management while guaranteeing compliance with ecological, social and economic standards are established. ■

PERFORATOR → Test apparatus used to determine the → **FORMALDEHYDE CONTENT** of wood-based material boards by means of extraction with toluol and subsequent photometric assessment. The test is described in the European EN 120 standard. ■

PMDI → Polymeric methylene diphenylene diisocyanate, a synthetic binding agent for the production of formaldehyde-free wood-based materials, especially → **OSB**. ■

POST-CONSUMER RECYCLING → Re-use of materials that were already used in products and have passed through a usage phase. The major challenge is to separate the materials so that they once again constitute base materials for new products. However, recycling often constitutes down-cycling since uses for the resulting materials are limited. ■

POTENTIAL IMPACT → When preparing a life cycle assessment, all inputs and outputs relevant for the product are captured in the form of substance and emission flows. In order to establish the relationship to the environment, these flows are calculated with factors for their potential environmental impact (e.g. global warming potential, ozone formation potential etc.). The potential environmental impact can be differentiated according to the local, regional and global impact. ■

PRE-CONSUMER RECYCLING → Pre-consumer recycling includes all materials and substances generated in the production of consumer goods that fail to meet the required quality standards. They are rejects and therefore do not reach the consumer. These substances are often treated as waste and deposited in landfills or used thermally. With complete pre-consumer recycling, these products and substances are instead used directly in the production of a product. ■

R

RAL → The "RAL Deutsches Institut für Gütesicherung und Kennzeichnung e.V." (RAL German Institute for Quality Assurance and Labelling) ((formerly the "Reichs-Ausschuss für Lieferbedingungen" (Imperial Committee for Delivery Terms and Conditions)) conducts the expert hearings for awarding the → **"BLAUER ENGEL" (BLUE ANGEL)**. At the same time, the institute is responsible for awarding the European Ecolabel (Euroblume) in Germany. The conditions for awarding the Blue Angel for various product classes are summarised in the RAL-UZ directive. Awarding the Blue Angel for wood-based materials is based on Directive RAL-UZ 76 for wood-based material boards and RAL-UZ 38 for wood-based material products. ■

REACH → EU chemicals directive that came into force on 1st June 2007. REACH stands for the registration, evaluation, authorisation and restriction of chemicals. Prior chemicals law was fundamentally harmonised and simplified by REACH. ■

ROOM AIR QUALITY → **INDOOR AIR QUALITY**. ■

S

SHORT CYCLE LAMINATION → This is a process for gluing decorative papers soaked with resin (→ **IMPREGNATED PAPER**) to wood-based material coreboards on a cycle. ■

SUSTAINABILITY → Sustainability is the use of a renewable system, whereby its essential characteristics are maintained and its existence can be regenerated naturally. The term comes from forestry where the exploitation of forests should correspond to annual growth. Today sustainability is no longer limited exclusively to material sustainability. Ecological, economical and social aspects are incorporated in the processes. ■

T

TVOC → The "Ausschuss zur gesundheitlichen Bewertung von Bauprodukten" (Committee for Health-related Evaluation of Building Products) in Germany (→ **AGBB** 2008) developed an approach in 2001 for the health assessment of → **VOC** emissions from building products used on the interior of buildings. It defines TVOC as the sum of all substances with a measured concentration higher than 5 µg/m³. ■

U

UF, MF, PF, MUF, MUPF → Abbreviations for the glue systems most frequently used in the wood-based material industry, wherein the main components of urea (U), melamine (M) and phenol (P) react with → **FORMALDEHYDE** (F) in a condensation reaction. In addition to use in manufacturing, UF, MF and PF are also used as resin systems for the production of → **IMPREGNATED PAPER**. ■

V

VOC → Volatile organic compound. Containing carbon, volatile organic compounds can evaporate at normal pressure due their relatively high vapour pressure. According to the WHO, VOCs are classified according to their boiling points as follows: very volatile organic compound (VVOC, boiling point greater than 0 to 50 °C), volatile organic compound (VOC, boiling point between 50 to 100 and 240 to 260 °C) and semi-volatile organic compound (SVOC, boiling point between 240 to 260 and 380 to 400 °C). ■

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Fraunhofer-Institut für Holzforschung
Wilhelm-Klauditz-Institut WKI
Bienroder Weg 54 E
38108 Braunschweig

The WKI in Braunschweig is involved in current and future projects related to the use of wood and other renewable raw materials. This includes processes for the manufacture of chipboard and fibre materials, surface technologies, measures for wood protection, for environmental research and recycling.

PE CEE Nachhaltigkeitsberatung & Software
Vertriebs GmbH
Hütteldorferstr. 63-65 Top 8
1150 Wien

PE INTERNATIONAL supports international corporations in developing consistent sustainable manufacturing and management processes since 1991. Today PE INTERNATIONAL is the market leader in strategic consulting, software solutions and comprehensive services in the topic area of sustainability.

Comparison of *Certification Systems*

In this section, we are presenting the common building certification systems, ecolabels and product databases. For a practical comparison including the respective performance, comparative tables and comprehensive descriptions of the certificates presented here, please visit our website at www.egger.com/environmental-brochure

DGNB → "Deutsche Gesellschaft für Nachhaltiges Bauen e. V." (German Sustainable Building Council), a certification system for sustainable and economically efficient construction in Germany. It was founded in 2007 by 16 initiators from various fields within the construction and real estate sectors. A certification system was released just one year later and more than 750 projects have already been certified. Around 50 criteria in the areas of ecology, economy, sociocultural and functional aspects, technology, processes and location apply for the evaluation of structures. Depending on the degree of compliance with the requirements, the programme owner DGNB awards certificates in gold, silver or bronze.

Source and further information: www.dgnb.de

MINERGIE ECO → Minergie, the Swiss association for building certification, is jointly supported by industry, the cantons and the federal government. It has developed various quality standards for buildings: "Minergie", "Minergie-P" and "Minergie-A". The adjunct "Eco" can be co-certified for each standard. It prescribes the exclusive use of healthy and recyclable building materials. Furthermore, grey energy in the sum of all building materials has to be as low as possible. The list of questions for new construction and/or modernisation must be met for approval according to Minergie Eco. Minergie issues a separate list of questions for small new residential buildings up to 500 m².

Source and further information: www.minergie.ch

BREEAM → Building Research Establishment Environmental Assessment Method. A British building certification system established in 1990; more than 200,000 buildings worldwide have been certified according to its standards to date. The evaluation categories include construction, use and design of materials, energy and water consumption, transportation, material, ecology and waste management. BREEAM provides catalogues of

measures for a variety of building types, from schools to office buildings and from jails to hospitals. The method combines the awarded points in an overall assessment and evaluates it according to five levels of compliance from “pass” to “outstanding”.

Source and further information: www.breeam.org

LEED → Leadership in Energy and Environmental Design, a US classification system. It was developed in 1998 by the US Green Building Council and encompasses a series of standards for environmentally friendly, sustainable construction that conserves resources. LEED offers various bodies of rules and regulations, for example for new construction and extensive renovations, the building shell without interior design and commercial interior design. A certain number of points per category has to be earned in order to meet the requirements. Their sum is decisive for silver, gold or platinum certification. LEED is currently established in 135 countries around the world, with approximately 50 percent of certificates being issued outside the USA.

Source and further information: www.usgbc.org/leed

ÖSTERREICHISCHES UMWELTZEICHEN → This ecolabel has been awarded by the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management since 1990. It is intended for products, tourism operations and educational institutions. There is a separate inspection guideline for each division and product type. Directive UZ 07 “Wood and Wood-Based Materials” and UZ 56 “Floor Coverings” apply to wood-based materials. The objective of the seal of approval is to make the general public aware of the environmental impact of consumer goods due to their production, use and disposal.

Source and further information: www.umweltzeichen.at.

DER BLAUE ENGEL → “Blauer Engel” (Blue Angel) seal of approval has been awarded to environmentally friendly products and services in Germany since 1978. It is owned by the Federal Ministry of the Environment, Conservation and Nuclear Power Safety. Certain criteria have to be met to earn the seal of approval. These are described by directive RAL-UZ 76 for wood-based material boards and RAL-UZ 38 for wood-based material products.

EGGER has earned the Blue Angel seal of approval for the following products: *EGGER DPL laminate flooring, EGGER DPR® laminate flooring, EGGER DHF*

Source and further information: www.blauer-engel.de.

EUROBLUME → The European Commission introduced the “Euroblume” European ecolabel in 1992 as an international seal of approval. In the year 2000, the European Parliament and the European Council passed the related Directive 1980/2000/EC. It is administered by the Ecolabel Committee of the European Union. However, the catalogue of criteria only exists for flooring to date (conditions for awarding the ecolabel: 2010/18/EC). Building products and wood-based materials on the other hand were not included.

Source and further information: www.ecolabel.eu.

NORDIC SWAN → The “Nordic Swan” ecolabel was introduced in 1989 by the Nordic Council of Ministers. It is implemented in Sweden,

Norway, Iceland, Denmark and Finland by the respective governments. The Nordic Swan is among the most widespread ecolabels and enjoys great recognition, especially in Scandinavia. This ecolabel establishes catalogues of requirements for floor coverings as well as board materials in the construction and furniture sectors.

Source and further information: www.svanen.nu.

LIGNUM → Founded in 1931, "Lignum, Holzwirtschaft Schweiz" is the umbrella organisation of the Swiss timber and forest industry. It brings together all key associations and organisations in the wood exploitation chain, research and educational institutions, public corporations and companies as well as numerous architects and engineers. Lignum dedicates itself to the formaldehyde issue among other things, and promotes wood-based materials with emissions that fall below strict limits. The organisation offers extensive information on the topic, including a list of wood-based materials suitable for interior applications.

Source and further information: www.lignum.ch.

BAUBOOK → The Austrian Baubook GmbH is a comprehensive information and communication hub for energy-efficient and ecological construction. It supports sustainable construction projects and healthy living. Baubook is supported by the "Energieinstitut Vorarlberg" (Vorarlberg Energy Institute) and IBO GmbH. Manufacturers can declare their building products in Baubook. In order to do so, they disclose structural-physical and structural-ecological performance figures as well as product-group-specific characteristics and product descriptions, images, technical bulletins and safety datasheets. Following successful quality testing, the products are listed with all relevant Baubook platforms and exported to the energy certification calculation programmes. This simplifies processing for supported residential construction.

Source and further information: www.baubook.info

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PUBLISHER
FRITZ EGGER GmbH & Co. OG
Holzwerkstoffe
Weiberndorf 20
6380 St. Johann in Tirol
Austria
T +43 50 600-0
F +43 50 600-10111
info-sjo@egger.com

PROJECT MANAGEMENT
Andreas Herzog-Heim,
Product Management Environment & Core Products

CONCEPTUAL DESIGN, LAYOUT & EDITING
Raufeld Medien, www.raufeld.de
Daniel Krüger, Till Schröder

PHOTOGRAPHY
EGGER, Fotolia, Markus Mitterer,
Martin Rugner, Raufeld Medien

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