

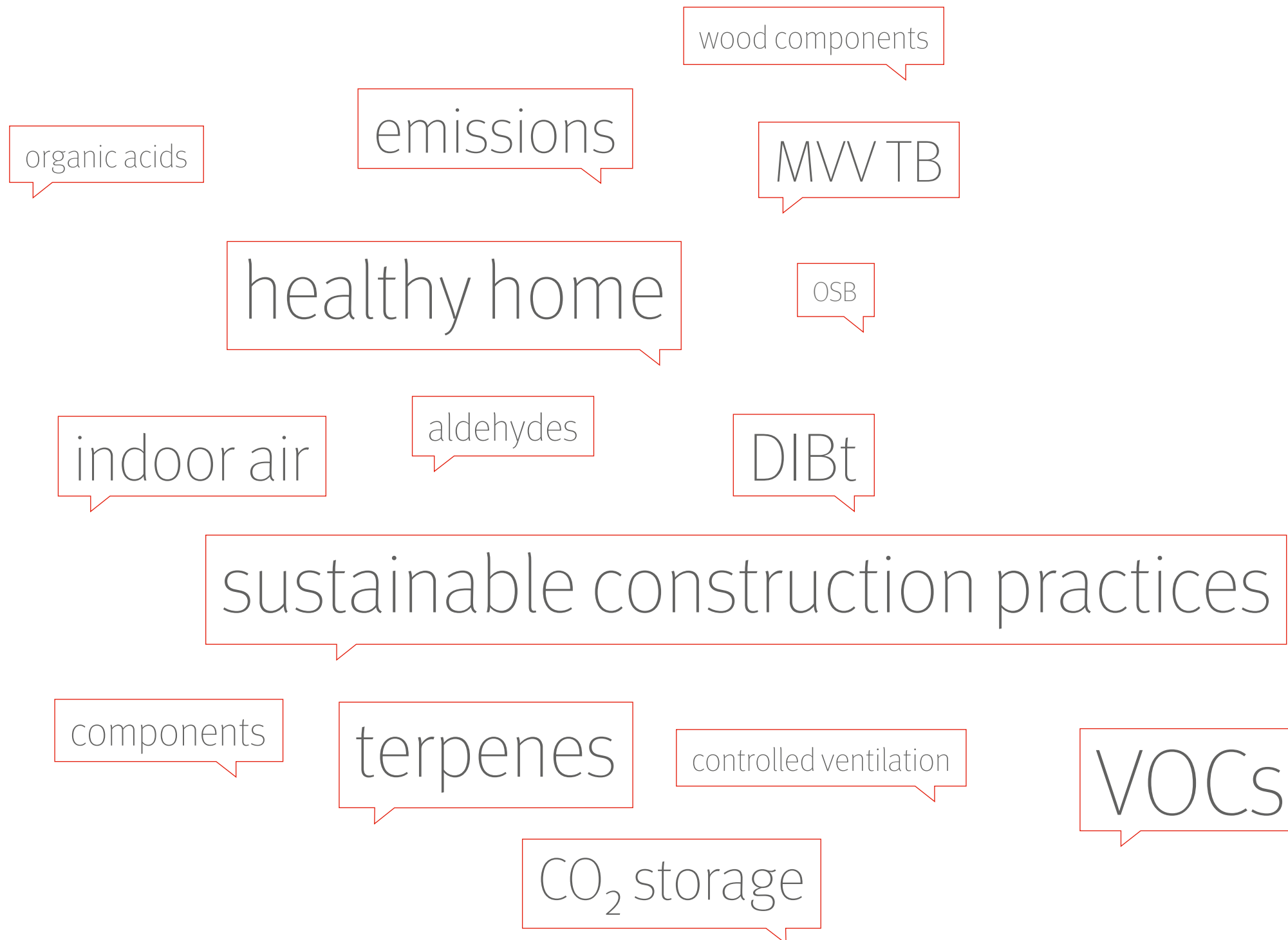
MORE FROM WOOD.



**The naturally good
construction material.**



There is a lot being said
about the use of OSB indoors
and there is
much speculation



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Do you like the smell of wood?

Yes? So do we.

A morning walk through the forest, past freshly cut wooden stacks. Just let the heart be free and inhale the pleasant odour of the **forest and wood**.

Does it sound dangerous? Well, it isn't!

Of course, **OSB boards** smell different from a freshly cut stack of wood, but the substances released by an OSB board are based on the wood components and are comparable to those of logs. Wood and wood-based materials emit **natural wood components that can be smelled**. They are partly formed subsequently through contact with air and from the wood's fatty acids.

However, users and planners who are interested in **healthy building and living** are currently given the impression that both wood and wood-based materials could negatively affect the well-being of residents due to their emissions.

On the following pages we question these statements and create transparency as a wood-based materials manufacturer.



We produce
accordingly to the
EGGER purity law.

Three's a charm - the EGGER purity law states that the production process of our OSB boards only uses forest-fresh logs, glue and wax. Accordingly, we emphasise the importance importance to EGGER OSB boards meeting the increasing requirements for building products.

Ingredients of EGGER OSB



» 94 % forest-fresh logs

EGGER OSB boards consist of **94 % forest-fresh logs** – mainly softwood – from sustainable forestry.

» 5 % glue

The 5 % PMDI glue used is a polymeric isocyanate, which reacts to polycarbamide and polyurethane during hot pressing of the board in our plant in Wismar. As a result, it no longer releases volatile substances and is emission-free and odourless.

» 1 % paraffin wax

The remaining 1 % of the board is **paraffin wax** to improve moisture resistance.

GOOD TO KNOW

Isocyanates are found as a raw material especially in industry - it is also part of the production of car fittings and shoe soles! The German Federal Environment Agency concludes in its "Guideline for indoor hygiene in school buildings" that "PMDI adhesives used after the production of wood-based materials are chemically cured in such a way that no danger or emissions can be detected in the indoor air". Science (WKI Braunschweig, EMPA, Zurich) also certifies that OSB products with PMDI adhesives are "not a health hazard" (WKI Braunschweig, EMPA, Zurich).



Most people's experiences with wood in interior spaces are pleasant.⁽¹⁾

The typical OSB odour is not due, as is often assumed, to the added glue, but to substances formed from the natural raw material wood or wood components. We refer to these as VOCs.

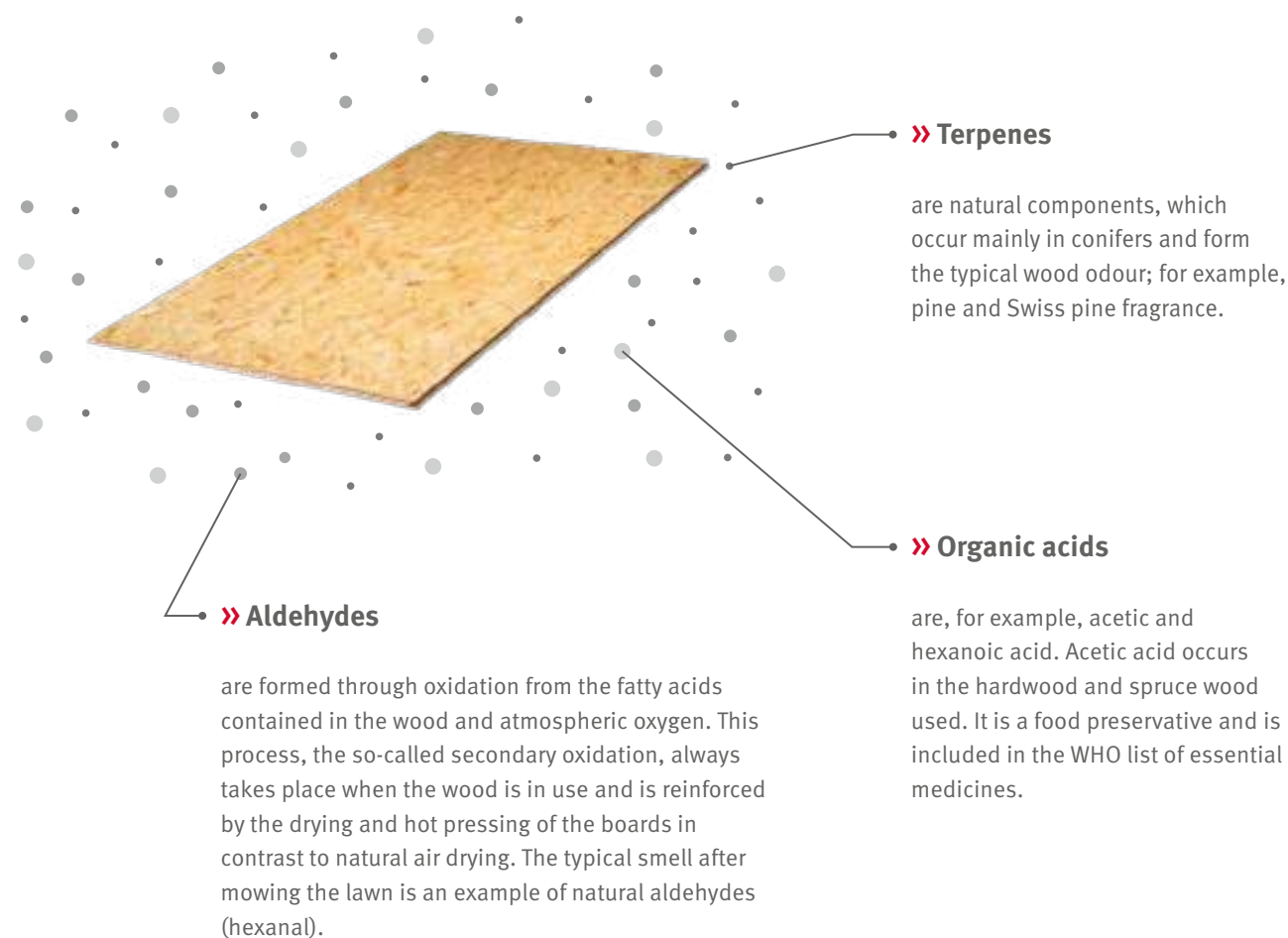
What are VOCs?

VOCs are Volatile Organic Compounds that are mainly composed of carbon and hydrogen. Due to their low boiling point they **evaporate at room temperature** and contribute to indoor air quality. The presence of VOCs is varied. They can be found not only in construction materials, but also in interior

textiles, food, cosmetics and perfumes. They also arise during cooking, cleaning and other activities. So we are surrounded **daily by VOCs** in a variety of concentrations.

VOCs from EGGER OSB boards?

The most common emissions from wood and wood-based materials are **terpenes, aldehydes** and **organic acids**. Depending on the type of wood, these occur in different proportions and concentrations.



What is the impact of VOCs from wood-based materials on people?

In order to answer the question of the health relevance of VOCs from wood-based materials, a comprehensive human toxicity study⁽²⁾ was carried out by the Freiburg University Hospital on wood and wood-based materials emissions. The conclusion of the study is that there is no **danger posed to people** due to the release of VOCs typical of wood or wood-based materials into the room air in the case of **usual and proper installation of wood-based materials**.

Furthermore, the Informationsdienst Holz published in cooperation with the GD Holz e. V. for the DBU research project HOMERA⁽¹⁾ a brochure on the health

effects of wood and wood-based products in the residential and working environment. Here, too, it was established that **wood has a positive effect on indoor air and / or on people**.

The two studies show that planners and users should take advantage of the positive effects of wood use on indoor air. There are now many publications and professional development opportunities on this topic.



EGGER OSB boards – proven to be safe

According to construction legislation, buildings must be designed and constructed in such a way that they **do not pose any danger to residents and users.**

In addition, as part of the implementation of **MVV TB** (Model Administrative Regulation Technical Building Regulations), Germany has redefined the requirements for OSB with regard to health protection and hygiene and defined **VOC threshold values.**

The manufacturers are free to develop different VOC certificates corresponding to the market.

EGGER has decided to apply for the VOC-specific DIBt expertise on the basis of extensive product tests. It includes an initial assessment of the

VOCs of relevant board types (representative for the thickness range – in each case the thinnest and thickest OSB board) on the basis of the AgBB scheme and EN 16516.

This results in:

- The obligation to carry out **annual external monitoring** through an accredited inspection body on the basis of the concluded monitoring contract.
- A high level of acceptance from planners and builders due to inspections by **independent accredited testing institutes** and final **evaluation by experts from DIBt.**

IMPORTANT

EGGER OSB boards meet the legal requirements of MVV TB, appendix ABG.

This guarantees to builders and entrepreneurs that EGGER OSB boards meet the **building supervisory requirements for building projects** applicable in Germany. **Expertise report G-160-18-0007** lists product-related threshold values that apply within Germany. EGGER OSB can also be used safely within the EU and Switzerland.

You can download the expertise report at:

www.egger.com/dibt-gutachten

As well as on the website of the DIBt: **www.dibt.de**





The peeling
of an orange
releases more
emissions
than the OSB
planking.

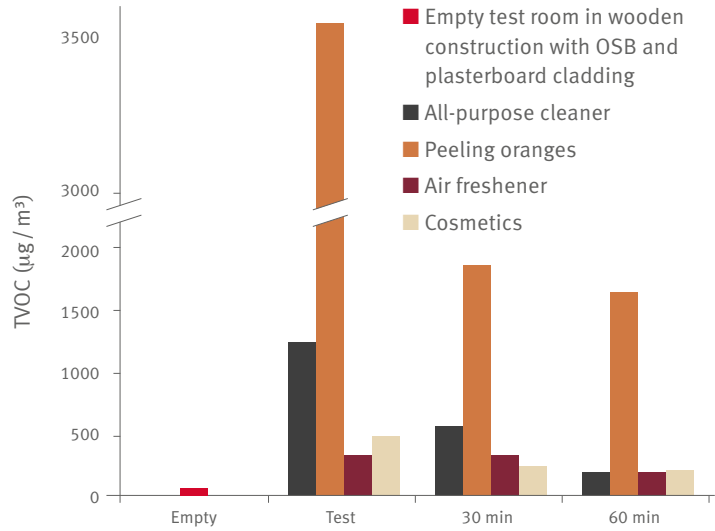
Scientists from the Vienna University of Technology came to this conclusion when they simulated different scenarios in a 30 m² model room planked with OSB in order to show which individual activities affect the indoor air.⁽¹⁾

Indoor air quality

Airtight construction is an important energy-saving measure, but is currently opening discussions within the construction industry. The reason for this is that this construction method results in a longer retention of heat in the interior, but also of emissions.

Independent of the construction method, various factors influence the indoor air quality. Wood and wood-based materials are among the **influencing factors perceived positively**. The ventilation conditions and also the user

behaviour determine the quality of the indoor air. In all common rooms, **other artificial emission sources** also contribute to the indoor air quality in addition to natural ones. Therefore, the impact of interior fittings and related equipment should not be ignored.



An indoor air test takes into account **the total of all volatile organic compounds**, for short TVOC (Total Volatile Organic Compounds). With adequate ventilation, there are on average 300 – 1,000 $\mu\text{g} / \text{m}^3$ VOCs in indoor air.

Wood and wood-based materials as a construction material demonstrate a decay curve, meaning that VOC emissions decrease significantly over time.



How can you ensure quality indoor air?

Expert construction supervision and the use of tested building products are important prerequisites for good indoor air quality. For the utilisation phase, especially in the case of air-tight construction, **regular air exchange is necessary for a healthy indoor climate**. All interior activities, such as cleaning and cooking or furnishing, have an impact on the quality of indoor air. In this case, controlled ventilation or a ventilation concept created during the planning phase helps to significantly reduce the **concentration of VOCs in the interior**.

This also regulates indoor air and component moisture, microbial loads and the carbon dioxide content of the air and **increases air quality**. Depending on building size and type of use, central or decentralised ventilation systems can be useful.

In order to maintain certainty as to the room air quality, a quality inspection by means of indoor air measurement can be agreed for the time of construction completion, if necessary. **Wood and wood-based materials have been shown to clearly reduce VOC emissions** after completion of construction work.

Transparency is important to us.

EGGER achieves transparency through a **reliable database** and competent advice. The use of our products, not only for a sustainably certified building, should be as straightforward as possible. For this reason, we summarise all environmentally relevant data concerning our materials in our **EPDs**. Our **manufacturer declarations** deal with additional questions regarding such topics as pollutants or building certifications. All current downloads can be found online at: **www.egger.com/nachhaltigkeit**

IMPORTANT

Application technology hotline

Contact us for questions on the topic of emissions, technical support for our products, execution, or for requests of test reports.

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Bibliography

1

DBU HOMERA study of the Munich Technical University under Documentation at www.informationsdienst-holz.de/publikationen

2

Prof. Dr. med. Volker Mersch-Sundermann/Prof. Professor Rainer Marutzky (2009): Evaluierung der gesundheitlichen Wirkung holz- bzw. holzwerkstoffspezifischer Emissionen. (Evaluation of the health effects of wood or wood-based material emissions.) (Human toxicity study)

Would you like to know more? We recommend:

- GD Holz brochure
- DHV brochure for planners and timber builders on VOC
- FNR studies "HoInRaLu" and GesundHOLZ
- Wood k plus projects: COMET FV4.9 / BigConAir
- Website of Informationsdienst Holz on indoor air quality www.holz-und-raumluft.de
- Guide of the Federal Ministry of Environment concerning the implementation and evaluation of indoor air measurements www.umweltbundesamt.de
- For more information, please refer to our FAQs www.egger.com/voc-faq

Glossary

A – C

AGBB SCHEME

Since 2001, the Committee for the Health Assessment of Building Products (AgBB) has been publishing in Germany an assessment scheme for building products with regard to their emissions. The AgBB scheme is updated periodically.

ALDEHYDES

Aldehydes are chemical compounds made of hydrogen and carbon. Aldehydes with chain lengths up to C16 belong to the very volatile (VVOC) and volatile (VOC) organic substances. They are formed, among other things, through the metabolism of living beings, but as synthetic substances they also find a wide range of applications, such as in the cosmetics industry as fragrance or in the chemical industry. Formaldehyde is a colourless substance with a pungent odour from the group of aldehydes. It is gaseous at room temperature. It is required as a disinfectant and for the production of organic preparations. It also plays an important role in glue and impregnation resin production for the wood-based materials industry.

D – F

DIBT – DEUTSCHES INSTITUT FÜR BAUTECHNIK IN BERLIN

The DIBt is the highest construction authority in Germany and a public law authority in 16 federal states. With its approvals, permits and assessments, it ensures the safety of buildings, and

at the same time, it supports the development of new building products and types of construction. DIBt is a technical authority and service provider for the construction industry. The DIBt is managed by the conference of ministers of construction. The conference of ministers of construction is the committee of ministers and senators in charge of urban planning, construction and housing of the 16 states of the Federal Republic of Germany.

E

EMISSION

Discharge or output of substances / particles into the environment. The source is referred to as the emitter. Each emission results in an immission (effect). In the case of wood-based materials, it is especially formaldehyde from bonding agents, but also volatile organic compounds (VOC) that originate in the wood itself (e.g. terpenes).

EPD

Environmental Product Declaration. The documentation drawn up on the basis of life cycle assessments and in accordance with the requirements of EN 15804 is intended to produce and improve the transparency and comparability of data relating to building products. National and international programme owners, such as the Institut Bauen und Umwelt e.V. (IBU), ensure a high level of credibility through independent verification of the manufacturer's data. www.ibu-epd.com

G – J

HEXANOIC (ACID)

Also called caproic acid, it is a saturated fatty acid. It is a colourless, oily liquid whose common name capron (capra = goat) indicates an unpleasant odour. Hexanoic acid occurs widely in nature (e.g. in softwood), in essential oils, the leaves and fruits of many plants, coconut fat, etc. Like many other carboxylic acids, it is used for the synthesis of fruit aromas.

M

MVV TB

The Model Administrative Regulation Technical Building Regulations is published by the DIBt. The principle is that only such content is included in it as technical building regulation that is indispensable to meet the requirements of the building regulations for construction equipment, building products and other systems and facilities. The Deutsche Institut für Bautechnik, after consulting the parties concerned in agreement with the upper construction authorities, issue the technical building regulations as a model administrative regulation. The public announcement of the administrative regulation is required for direct application in the respective country.

O

OSB

Acronym for Oriented Strand Board; OSB is a board-shaped wood-based material made from long, slender chips (strands). After drying and gluing, the strands are spread on three layers, aligned crosswise and then pressed hot under high pressure.

P

PARAFFIN (WAX)

Paraffin is mobile, oily or waxy, combustible, odourless and tasteless, non-toxic, electrically insulating, water-repellent, and can be fused with fats and waxes. The possibilities of use are very diverse due to these properties. It is mainly used as fuel, sealing, for maintenance, preservation and hydrophobising. EU Regulation (EC) no. 1272 / 2008 (CLP) classifies paraffin as safe for humans and the environment.

PMDI GLUING

Polymeric diphenylmethane diisocyanate, synthetic resin / binding agent for the production of formaldehyde-free wood-based materials.

T

TERPENES

Terpenes are organic compounds which occur in the form of hydrocarbons, such as alcohols, ethers, aldehydes, or ketones. The common building block of all terpenes is the isoprene. Terpenes are among the secondary plant compounds and are widespread as such. They are used for the production of odorous substances, medicinal products, as raw materials for industry and as the main component of plant-based essential oils.

THRESHOLD VALUES

The designation of threshold values is used in connection with a legally binding basis. Legal requirements for buildings and building products form the framework for setting threshold values on indoor air quality. Assessment or guidance values are used to evaluate individual substances that are not toxicologically motivated. These values have no legal basis and rely on measurements and experience.

TVOC

The Committee for the Health Assessment of Building Products (AgBB 2008) in Germany established in 2001 a procedure for the health assessment of VOC emissions from building materials used indoors. It defines TVOC as the sum of all individual substances with a measured concentration above 5 µg / m³.

U – Z

VOCs

Volatile organic compounds are volatile organic (carbonaceous) compounds that can vaporise at normal pressure due to their relatively high vapour pressure. According to the WHO, VOCs are categorised by their boiling points into Very Volatile Organic Compounds (VVOC, boiling interval above 0 to 50°C), Volatile Organic Compounds (VOC, boiling interval between 50 and 100 to 240 and 260 °C) and Semi Volatile Organic Compounds (SVOC, boiling interval between 240 to 260 and 380 to 400 °C). Due to their low boiling interval, VVOCs and VOCs evaporate quickly into the indoor air as gas. They are perceived by people as odour / fragrance. Examples of typical VOCs whose odour can be perceived are pine needle fragrance, perfume, lavender, onion, lemon / orange, solvent from adhesive and paints, etc.

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