



Federal Institute for
Research on Building,
Urban Affairs and
Spatial Development

within the Federal Office for
Building and Regional Planning

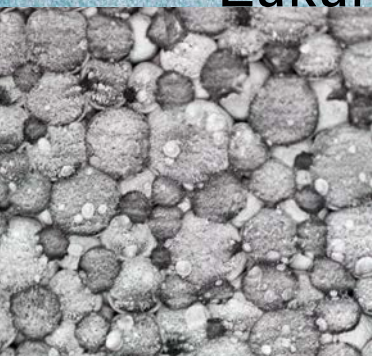


Zukunft Bauen

Forschung für die Praxis | Volume 14

WECOBIS

Web-based information system
on ecological building materials



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WECOBIS

WECOBIS is a web portal providing information on building materials for health-aware and eco-conscious construction. With comprehensive, product-independent information regarding constituent materials, problematic emissions in lifecycle phases, legal requirements and product labelling, as well as material-related ecological requirements, it offers assistance with the planning and tendering process.

WECOBIS is therefore ideal for choosing eco-conscious products and is aimed at building professionals and prospective clients with an interest in sustainable building, including architects, planners, construction companies and building users.

› Editing team

The Federal Institute for Building, Urban Affairs and Spatial Research (BBSR) and the Bavarian Chamber of Architects (ByAK) are the editors in chief.

Content is edited by an international group of specialist editors.

› Scientific advisory committee

A scientific advisory committee specifies the key areas of content and recommends topics for further development.

› Integration into Sustainable Construction in the Federation

WECOBIS is part of the planning tools that are used to implement the Guidelines for Sustainable Building and for the application of the Assessment System for Sustainable Building in the Federal Sector (BNB).

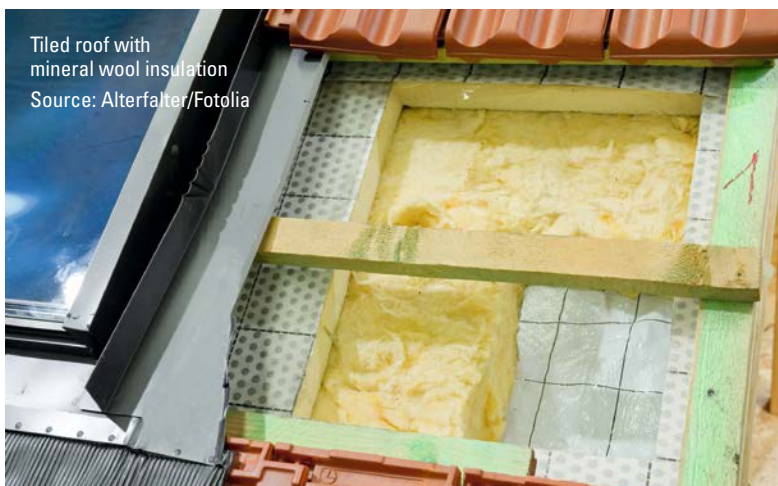
Environmental and health-related aspects of choosing building materials

WECOBIS groups together environmental and health-related aspects based on lifecycle phases. Together with the additional information on planning, tendering, labels and declarations and the BNB, WECOBIS therefore also supports:

- › The development of material concepts for sustainable planning
- › The pre-selection of construction product groups from the perspectives of the environment and health
- › The classification of building material-related criteria in the assessment system for Sustainable Building in the Federal Sector (BNB) in planning and tendering
- › The definition of levels of quality in the planning process with regard to the selection of building materials
- › The use of building materials with a 360° view over all lifecycle phases

Content is used in practical terms in:

- › Information summaries for the classification of building materials in accordance with BNB requirements
- › Planning and tendering assistance with material ecology requirements and text modules
- › myWECOBIS for storing and maintaining content for personal projects





WECOBIS

Ökologisches Baustoffinformationssystem

www.WECOBIS.de

Data, information, knowledge, standards, tools for ecological building material information:

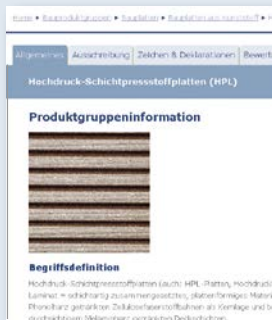
➤ Local aspects

➤ Global aspects

➤ Resources aspects

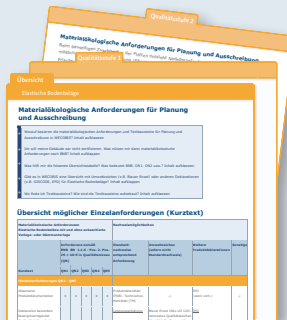
Construction product groups

Basic knowledge technical information



Planning & tendering assistance

Strategies & standard texts for tenders

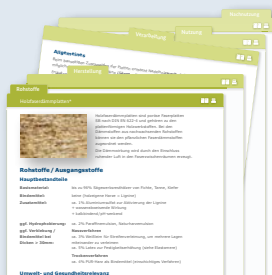


Links*

- ÖKOBAUDAT
- Federal Environment Agency
- Blauer Engel
- GISCODEs
- Bavarian State Ministry of the Environment

* Selection

Knowledge modules for lifecycle phases



As a tool, WECOBIS provides data, information, knowledge and strategies for the choice of building materials based on ecological criteria.

Source: BBSR

Technical information

WECOBIS provides information on a range of topics and arranges it in the following categories:

› **General**

Information regarding key components, characteristics or areas of application provide an introduction to the groups of construction products.

› **Tendering assistance**

Features construction product-related information on planning and tendering.

› **Seals & declarations**

Information regarding environmental product declarations (EPD) and environmental seals such as the Blaue Engel (Blue Angel) is set out clearly here.

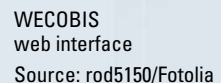
› **Assessment systems**

Assessment systems for sustainable construction are discussed here. WECOBIS provides building material expertise prepared especially for BNB criteria fact sheets.

› **Technical information**

Information regarding technical qualities, such as technical data and relevant DIN standards, complements environmental and health-related aspects.

Assessment system for sustainable building



Lifecycle consideration

From the first stroke of the planner's pen to the demolition of a building: WECOBIS examines not just the process for developing the building, but also its utilisation phase and the reuse of building materials. As a result, WECOBIS facilitates a future-focused choice of building materials in the present day.

› Raw materials / production

This category answers key questions on materials, the sourcing of basic materials, the availability of raw materials or the use of secondary raw materials. This means that impacts on humans and the environment can be stratified specifically for the early phases of the products lifecycle. Thereby measures can be derived to protect environment and health.

› Processing / use

Here, the reader sees a detailed description of how the construction products are processed. As well as reducing short-term emissions to protect process workers, it is the medium to long-term emissions that frequently trouble subsequent building users.

› Reuse

The aim is to avoid environmental and health-related risks during demolition. Simultaneously, this should prevent harmful and problematic materials from entering biological and technical supply cycles. The sustainable use of our resources is a highly complex issue, and is explored in this final lifecycle.

Raw materials

Production

Reuse

Use

Processing



Illustration of a raw materials diagram in the Lifecycle tab
Source: rodrusoleg/Fotolia

Planning & tendering assistance

The comprehensive information provided in WECOBIS helps planners and clients in a variety of ways to make environmentally responsible, health-aware and quality-conscious material and product choices.

› General information on planning and tendering

Divided into service phases, the planning services and tools required for choosing materials are listed clearly in this category.

› Material ecology requirements for each service area

WECOBIS provides text modules for the formulation of material ecology requirements in planning and tendering. The categorisation is based on the material groups and their areas of application, as well as on the BNB-related requirements arising from various fact sheets.

› Stage of development of the P&T assistance 2016

The aim is to provide planners - in accordance with BNB-related building material topics - with text modules for tendering purposes. To begin with, the content of BNB Fact Sheet 1.1.6 is available for use. Since 2018, further text modules are available for Fact Sheet 3.1.3 Internal room hygiene and 4.1.4 Demolition/separation/recycling.

BNB Fact Sheet 1.1.6 (Risks for the local environment)

SVHC Substances of Very High Concern
VOC Volatile organic compounds

Hazardous substances

Halogens

BIOCIDE

Heavy metals lead, cadmium, etc.

Formaldehyde



Information category
Planning & Tendering
Source: rod5150/Fotolia

myWECOBIS



Source: BBSR

With myWECOBIS, planners have frequently used content “easily to hand” and are able to actively integrate WECOBIS knowledge into their everyday planning activities.

› Convenient functions

myWECOBIS offers functions such as “Remember”, “Last viewed” or the “Media Pool” for clear and manageable working with extensive content.

› Project folder

Registered users can create their own projects file and manage personalised environmental and health-related data. The project folder is grouped by component, in accordance with DIN 276.

› Output of the project folder

The information assigned to the components is filed in a structured manner and is quickly retrievable. Printouts of project folders, for example, can be integrated directly into a planning meeting.

Content relevant to BNB

In “Assessment systems”, WECOBIS offers specific content for processing the following BNB criteria fact sheets:

➤ **Criteria fact sheet: Risks for the local environment – new builds (BN_1.1.6)**

The aim is to reduce or avoid materials that are potentially hazardous to groundwater and surface water, soil and air with new buildings. WECOBIS provides a summary for this, for example of which harmful materials may be relevant for a particular construction product group.

➤ **Criteria fact sheet: Risks for the local environment – complete restoration (BK_1.1.6)**

Here, users will find information on problematic and harmful substances in products that are no longer permitted, but which may be already integrated into existing building stock.

➤ **Criteria fact sheet: Interior room hygiene (3.1.3)**

The emphasis is on safeguarding air quality in internal rooms with regard to VOCs and formaldehyde. WECOBIS provides information on potential emissions and on the low-emissions materials available.

➤ **Criteria fact sheet: Demolition, separation, recycling (4.1.4)**

For BNB criteria fact sheet 4.1.4, WECOBIS provides supportive information on the product group's potential for demolition, sorting accuracy and recyclability, if necessary depending on the installation scenario.

Information summaries from WECOBIS

The www.WECOBIS.de website contains in-depth articles, for example on current topics of interest such as biocides, SVHCs and formaldehyde. Following are a few excerpts from these:

Formaldehyde: Extracts from the WECOBIS article by Dr Gerd Zwiener

For almost 150 years, formaldehyde has been used to manufacture and process industrial products. Although the material has been proven to cause cancer, the use of the chemical is still not banned today, unlike other harmful building materials such as asbestos or PCB. Due to its high degree of reactivity, formaldehyde remains an important base product for the chemical industry and a starter material for a wide range of other chemical substances.

Today, formaldehyde is mostly used to manufacture adhesive and impregnating resins for wood materials and decorative films and foils, for thermoplastic synthetics and as auxiliary materials in the textile, leather, fur, paper and timber industries.

Formaldehyde has been used for more than 100 years in the production of plastics. Bakelite®, a thermosetting synthetic based on phenol-formaldehyde resin, was developed in 1905 by the Belgian chemist Baekeland and was the first ever industrially produced plastic. Unlike the brittle Bakelite®,

polyoxymethylene (POM) is a thermoplastic synthetic that is made from the polymerisation of formaldehyde. POM is used in many different places, such as for furniture fittings. Paraformaldehyde, a white powder with a formaldehyde content of around 92%, is the short-chained polymer of formaldehyde and is used to fix biological tissues.

Possible construction product groups containing formaldehyde:

- Wooden composite board
- In situ foams
- Paints
- Adhesives
- Mineral wool
- Fibreglass tiles
- Concrete additives

A detailed article on this can be found at www.WECOBIS.de.



Perforated acoustic panels made from timber materials can cause significant emissions due to the increased surface area.

Source: Dr Gerd Zwiener

Organic growth on a mineral substrate
Source: BBSR



Biocide: Excerpts from the WECOBIS article by Daniel Savi and Matthias Klingler

Biocides are used to restrict the growth or reproduction of living organisms. In contact with flowing water, biocides can be released in significant quantities into the environment. This is the case with exterior areas and in wet rooms. This text will therefore primarily focus on the protection of buildings against algae, mould and plant growth.

In common parlance, chemicals that are able to kill living organisms even at relatively low concentrations are referred to as biocides. In legal parlance, the term biocide product is defined in the EU Biocide Product Act (528/2012) as “Any substance(s) or mixture of any kind intended to destroy, deter, render harmless, prevent or otherwise combat harmful organisms other than by physical or mechanical action”. Biocides of significance in the construction sector can be classified into fungicides, algicides, herbicides and insecticides.

Possible construction product groups with biocide components:

- Wood preservatives
- Surface treatments
- Paints and dyes
- Render
- Sealants/seals/root protection films
- Carpets
- Other products made from natural fibres

A detailed article on this can be found at www.WECOBIS.de.

SVHC: Excerpts from the WECOBIS article by Dr Caroline Thurner and Hildegund Figl

Article 57 of the REACH regulation defines what substances of very high concern (SVHC) are. SVHCs describe CMR (carcinogenic, mutagenic or toxic to reproduction, category 1A and 1B) substances as well as PBT (persistent, bio-accumulating and toxic) substances or very persistent and very bio-accumulating (vPvB) substances or substances which are of similar concern for other reasons.

Special rules apply to substances with SVHC properties that are already included on the "Candidate List of SVHC". So far, this list contains 144 substances (as of 06/2013). The list of candidates is used to identify substances that will potentially require authorisation. This is continuously being expanded at the request of individual EU member states or the EU Commission. The EU's long-term goal is to replace all of the approximately 224 SVHCs with substances of lesser concern wherever possible.



The use of flame retardant is widespread in building materials made from plastic.

Source: BBSR

... Using the example of flame retardants

According to a market study by Ceresana, two million tonnes of flame retardant were used worldwide in 2013. This study reveals that the biggest consumer is North America, followed by Europe. China uses around a quarter of the flame retardants produced around the world.

Flame retardants are used in consumer products such as electrical equipment, textiles, upholstered furniture, car interiors and building materials. The biggest area of use is building materials, and in particular insulation materials. Since cables are insulated with plastics and plastic pipes are increasingly replacing products made from metal or ceramic, an increase in the use of flame retardants is also being observed in this sector. For users, it is ultimately immaterial which products flame retardants are made from. What matters for them is the overall exposure.

There are health-related and/or ecological concerns over many flame retardants. Numerous studies confirm that halogenated hydrocarbons especially make their way into every part of the environment, and are being found in increasing concentrations in house dust, in human blood serum and even in breast milk. They also accumulate on the surfaces of micro-plastics.

Possible construction product groups containing flame retardants:

- EPX/XPS insulation panels
- Building technology components
- Epoxy resin coatings, adhesives
- Polyamide textile flooring
- Polyolefin vapour barriers
- Polyurethane insulation panels
- PET reinforcing fibres, textile flooring
- Polyester cladding, balcony profiles, roof constructions, corrugated and profile panels
- Polycarbonate synthetic glass
- Styrene copolymer sealing membranes

A detailed article on this can be found at www.WECOBIS.de.



Components such as roofs, external walls or suspended ceilings must generally have fire resistance class F90. They are made up of multiple layers and materials with varying degree of flammability.

Source: Alterfalter/Fotolia

For your own notes

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WECOBIS* is a project set up by the Federal Ministry of the Interior, Building and Community (BMI) and the Bavarian Chamber of Architects (ByAK). Together, they are the operators of the building material information system. The central office is based at the Federal Institute for Construction, Urban Affairs and Spatial Research (BBSR).

With its Zukunft Bau research initiative, the Federal Ministry of the Interior, Building and Community in collaboration with the Federal Institute for Construction, Urban Affairs and Spatial Research (BBSR) is strengthening the construction industry's innovativeness and readiness for the future. The aim is to improve the competitiveness of German construction on the European domestic market and, in particular, to support the growth of knowledge and understanding in the domain of technical, construction culture and organisational innovations.

On this bases, the BMI, the ByAK and the BBSR have been continuously developing the rich and varied information contained within WECOBIS. This brochure provides information about the content of the www.WECOBIS.de web portal and is aimed at architects, planners and clients. The retrieval of specialist information, the consideration of the lifecycle, tendering and planning assistance, myWECOBIS and much more are discussed.

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