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Identification of low-emitting interior products for LEED and BREEAM

Reinhard Oppl

Identification of low-emitting interior products for LEED and BREEAM

Speaker:

- Reinhard Oppl
  Certification manager at Eurofins Product Testing in Denmark and Germany
  Largest VOC testing lab world-wide with representatives in several countries

Announced contributions from the audience:

- Christina Welzel
  Alpha Immobilien Consulting, Germany
- Sara Cederberg
  US Green Building Council
- Thomas Hoinka
  greenbuildingproducts.eu, Germany
- Søren Ryom Villadsen
  Eurofins Product Testing, Denmark

Identification of low-emitting interior products for LEED and BREEAM

- LEED v4 credit on low-emitting interior products
- BREEAM Hea02 (earlier Hea09) criteria, sub-item "Volatile organic compound (VOC) emission levels (products)"

LEED and BREEAM

- Make reference to specific VOC and formaldehyde limit values and corresponding testing methods.
- In Europe many low and very low emitting products carry other labels than those referenced.
- A significantly larger number of low-emitting products are available for LEED or BREEAM certified construction sites
  - if all available information sources are used to identify low-emitting products
  - then even without the need and costs of new testing.

Appropriate procedures, information sources and basics of purchase specifications are outlined.

Identification of low-emitting interior products for LEED and BREEAM

Agenda

- The role of low VOC and low emitting products in LEED and BREEAM.
- VOC product requirements set out in LEED version 4.
- VOC product requirements set out in BREEAM.
- Basics on VOC testing and emissions testing.
- European programs to characterize low VOC and low emitting products.
- To which extent LEED and BREEAM will accept these labels as compliance path.
- How can project planners identify and verify compliant products for LEED and for BREEAM projects.
- Database containing compliant products.
- Outlook and Discussion

VOC regulations

- VOC = volatile organic compounds
  - Different definitions; typically solvents, additives, plasticizers with boiling point up to 250°C, or 280 °C, or n-Hexadecane (287 °C) …
  - VOC content and VOC emissions are different issues !
- Limitation of VOC content,
  applied to products wet when applied (coatings, glues, sealants)
  - Limit values were established for prevention of smog and ozone formation in cities
  - Europe: Decopaint Directive, 2004/42/CE, several ecolabels
  - USA, LEED US: Different by State and by County; best known:
    SCAQMD * – limit values around Los Angeles
    - Volatile compounds, minus Water, minus VOC that are not contributing to ozone formation
  - Limitation VOC emissions,
    applied to dry and wet products:
    - Regulations in Belgium, France, Germany
    - Several ecolabels, use is voluntary and for marketing of low emitting products:
      - Indoor Air Comfort, EMICODE, Blue Angel, M1, …

* SCAQMD = South Coast Air Quality Management District, local environmental pollution authority

Intervention:
Christina Welzel

Background: Alpha Immobilien Consulting

Munich, Germany

Sustainable real estate consulting and engineering services

LEED® APs
BREEAM Assessors
DGNB Auditors
BNB Koordinators
INHOUSE

- Facility Management
- Green Building & Sustainability
- Energy & Technology
- Building Climate &Physics
- Building Ecology

46 years of **Experience**

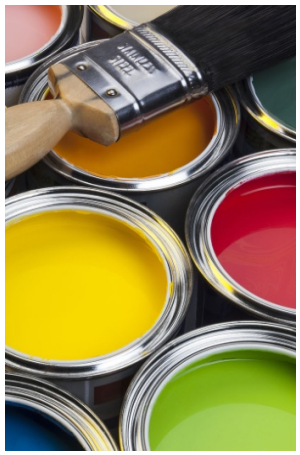
More than **180** **Green Building Projects**

THE ROLE OF VOC in LEED and BREEAM

Certification system	Harmful substances	Aim
LEED BREEAM	VOC Formaldehyde	Healthier environment through promoting the use of low-emitting building products

The Role of VOC in LEED and BREEAM

- Voluntary, not mandatory
- Helps achieve certain label
- Refers to building products on the interior
- Contributes to healthier environment through better indoor air quality
- Direct effect on building user and construction staff on site



LEED and BREEAM

- **LEED v4**

Indoor Environmental Quality

IEQc4 Low-Emitting Materials

Up to 3 credits for low-emitting products

Interior Paints and Coatings

Interior Adhesives and Sealants

Flooring

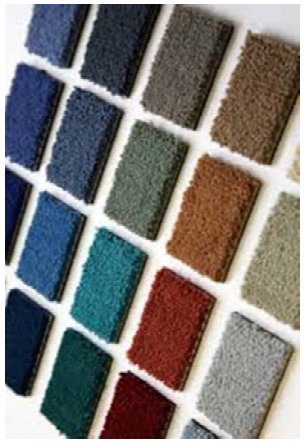
Composite Wood

Ceilings, Walls, Thermal and Acoustic Insulation *

Furniture

Healthcare/Schools only: Exterior applied products

*only applicable for schools



LEED and BREEAM

- **BREEAM International 2013**

Health and Wellbeing

Hea 02 Indoor Air Quality

1 credit for low-emitting products
1 credit for measuring TVOC and formaldehyde concentration levels (post construction)

A Paints and varnishes

B Wood panels

C Timber structures

D Wood flooring

E Resilient textile and laminated floor coverings

F Suspended ceiling tiles

G Flooring adhesives

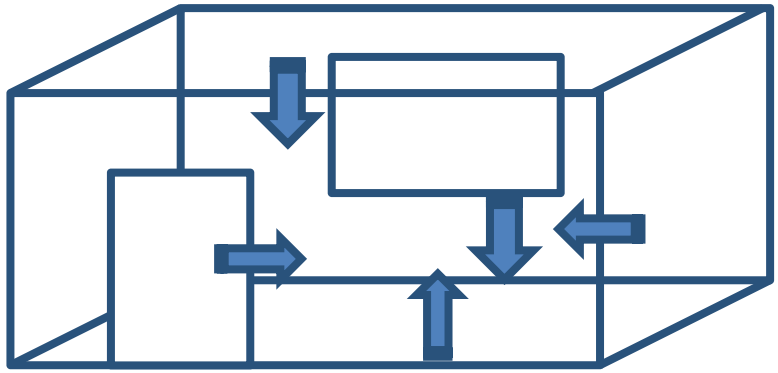
VOC product requirements set out in LEED version 4

LEED v4

- Indoor air quality and VOC emissions
- 2 alternative pathways of compliance; max 3 points
  - Products approach:
    - Interior paints and coatings applied wet on site
    - Interior adhesives and sealants applied wet on site (including flooring adhesive)
    - Flooring
    - Composite wood
    - Ceilings, walls, thermal, and insulation
    - Furniture (include in calculations if part of scope of work)
  - Systems approach

LEED v4

- Indoor air quality and VOC emissions
- 2 alternative pathways of compliance; max 3 points
  - Products approach
  - Systems approach – all surfaces in a system shall comply with low requirements:
    - Wall
    - Ceiling
    - Floor
    - Insulation
    - Furniture (in case of office buildings, schools)



LEED® v4 – Adhesives and Sealants, Paints and Coatings

- LEED v4:
  - All products: Limitation of VOC content
    (protection during application and early exposure)
    - SCAQMD rule 1168, CARB SCM 2007 or SCAQMD rule 1113 …;
    - Or, outside NA: National regulation if applicable
    - Disclosure of exempt VOC > 1%
    - Methylene chloride and perchloro ethylene may not be intentionally added
    - Testing: ASTM D2369-10; ISO 11890, part 1; ASTM D6886-03; or ISO 11890-2 are possible
  - 90% of all products: Limitations of VOC emissions
    – see next slide
  - See list of equivalent low VOC programs
    on homepage of US GBC, will be outlined later
- LEED Italy: Compliance with EMICODE EC1 if applicable

LEED® v4 – Flooring, ceiling, walls, insulation

- LEED v4 – VOC emissions:
  - CDPH "Section 01350" CPDH SM 1.1, version 2010
    - Limit values for 35 VOCs
    - On top for LEED: Disclosure of TVOC class
      (0,5 mg/m³ or less, between 0,5 and 5 mg/m³, 5 mg/m³ or more)
  - Or outside North America:
    - AgBB conformity, but on top: Formaldehyde like class A+ in France
      (10 µg/m³ after 28 days)
      (not in main text, in Reference Guide, but binding as well)
    - See the list of equivalent product rating schemes,
      on homepage of US GBC, will be outlined later
  - Inherently non-emitting sources, no testing:
    - Stone, ceramic, powder-coated metals, plated or anodized metal, glass, concrete, clay brick, and unfinished or untreated solid wood flooring
    - without integral organic-based surface coatings, binders, or sealants

LEED® v4 – Composite Wood

- Low emissions of formaldehyde
  according to the specifications of California Air Resources Board ATCM for
  - Ultra-low-emitting formaldehyde (ULEF) Resins
    - ULEF resins:
      Formaldehyde containing resins formulated such that the emissions of the wooden products are safely below the limits of the respective "Phase 2 emission standards".

Table 2
Ultra-Low-Emitting Formaldehyde (ULEF) Resin
Emission Target and Cap Values (in ppm) for
Particleboard (PB) and Medium Density Fiberboard (MDF)[1]

	PB	MDF	Thin MDF
ULEF-target	0.05	0.06	0.08
ULEF-cap	0.08	0.09	0.11

(1) Concentrations must be based on correlations with the primary or secondary test method in parts per million (ppm).

  - or No-added-formaldehyde (NAF) Resins
    - NAF resins:
      Resins without formaldehyde containing linking structures, e.g. resins based on soy, polyvinylacetate, or Methylendiisocyanate.
  - Or outside North America:
    - Max. 0.05 ppm of formaldehyde (or 0.06 mg/m²/h) when tested with EN 717-1, ISO 16000 or CEN/TS 16516.

LEED® v4 – System Furniture and Seating

- Limit values to be respected in a model office room:
  - System furniture:
    - ANSI/BIFMA e3-2011 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2
    - List of formaldehyde, VOCs, TVOC limit values
  - Seating:
    - Half the limit values of system furniture
- Proof of compliance:
  - ANSI/BIFMA X7.1/M7.1 emissions testing in test chamber
  - See the list of equivalent product rating schemes, see earlier slide

VOC product requirements set out in BREEAM

Intervention by
Søren Ryom Villadsen

VOC, Formaldehyde and BREEAM

- Wooden products, floor coverings, suspended ceiling tiles
  - E1 formaldehyde class applies;
    testing also is possible with ISO 16000 or CDPH.
  - Basic revision of VOC criteria is planned for 2016
  - + BREEAM Norway:
    Limitation of VOC emissions, see later
  - On top for Wooden products and any floor coverings:
    No regulated wood preservatives are used.
  - On top for suspended ceiling tiles:
    No asbestos is used.

VOC, Formaldehyd und BREEAM

- Flooring adhesives
  - No carcinogens and no sensitizers as defined in Annex of EN 13999-1 are emitted;
    Testing in a ventilated test chamber after 1 day (EN 13999 parts 2, 3, and 4):
    Determination of carcinogenic and sensitizing
    - VOCs
    - volatile aldehydes
    - volatile diisocyanates

    BREEAM 2014-Versions: Test after 3 days instead of 1 day.
  - Basic revision of VOC criteria is planned for 2016
  - + BREEAM Norway:
    Limitation of VOC emissions, see in later slides

VOC, Formaldehyd und BREEAM

- Wall coverings
  - No limitation of VOC emissions for BREEAM UK & International.
  - Emissions of formaldehyde and of vinyl chloride monomer, complying with standards EN 233, EN 234, EN 259, EN 266.
  - Migration of heavy metals and other toxic substances complies with above mentioned standards.
  - Basic revision of VOC criteria is planned for 2016
  - + BREEAM Norway:
    Limitation of VOC emissions, see in later slides
- Adhesives for hanging flexible wall coverings
  - No harmful substances.
  - Preservatives used are of minimum toxicity.
  - Basic revision of VOC criteria is planned for 2016
  - + BREEAM Norway:
    Limitation of VOC emissions, see in later slides

VOC, Formaldehyd und BREEAM

- Decorative paints and varnishes
  - No limitation of VOC emissions for BREEAM UK & International.
  - VOC content as specified for present phase 2 of EU Decopaint Directive.
  - Shall be fungal and algal resistant if used in damp rooms.
  - Basic revision of VOC criteria is planned for 2016
  - + BREEAM Norway:
    FLEC- or chamber testing of the VOC emissions after 3 days,
    but only documentation – no pass/fail criterion
- Sealants
  - BREEAM Norway:
    Limitation of VOC emissions, see in later slides
  - BREEAM Netherlands:
    Limits and testing as for flooring adhesives
    (even though the respective testing standard does not specify adhesive testing).

VOC and BREEAM Norway

- EN 15251 (2007) – Annex C (will be superseded by EN 16798-1)

Majority of used material (after 28 days in ventilated test chamber)	For low polluted building	For very low polluted building
TVOC	< 200 µg/m²h	< 100 µg/m²h
Formaldehyde	< 50 µg/m²h	< 20 µg/m²h
Ammonia (test required by BREEAM Norway only if traceable in the product)	< 30 µg/m²h	< 10 µg/m²h
IARC carcinogens	< 5 µg/m²h	< 2 µg/m²h
Not odorous; panel dissatisfaction with odour (not always compulsory for BREEAM Norway)	15 %	10 %

- Conversion factors from µg/m²h to µg/m³ in European Reference Room (as in prEN 16516):
- Floor, ceiling: µg/m³ = 0,8 x µg/m²h
- Walls: µg/m³ = 2,0 x µg/m²h
- Sealants: µg/m³ = 0,014 x µg/m²h

Basics on VOC testing

Intervention by
Søren Ryom Villadsen

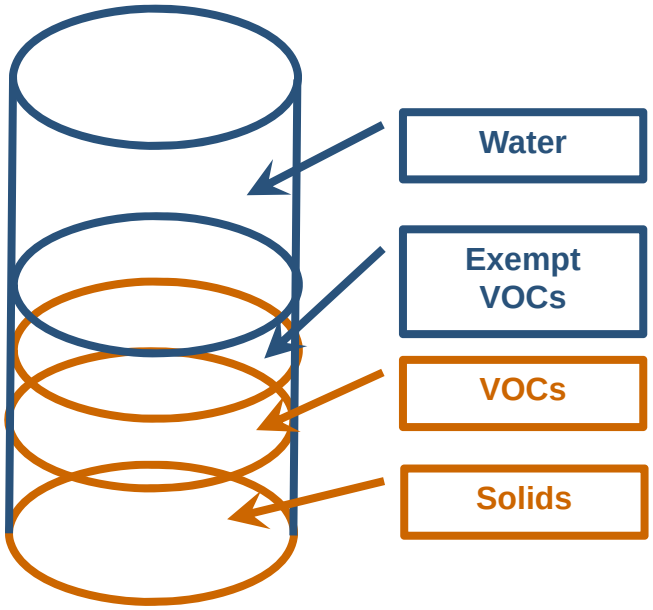
VOC content testing

VOC content testing:

- EU:
  - Limits in g/l VOC in the ready-to-use product
    Specific limits depend on product type.

- USA:
  - Limits in g/l VOC in the ready-to-use product,
    minus water,
    minus "exempt compounds" that do not contribute to urban smog
    Specific limits depend on product type.

  - e.g. Formulation on basis of 80% acetone (exempt compound) = 0% VOC in USA



SVOC content testing: Only for Europe

SVOC content testing for paints and coatings :

(Semi-volatile Organic Compounds)

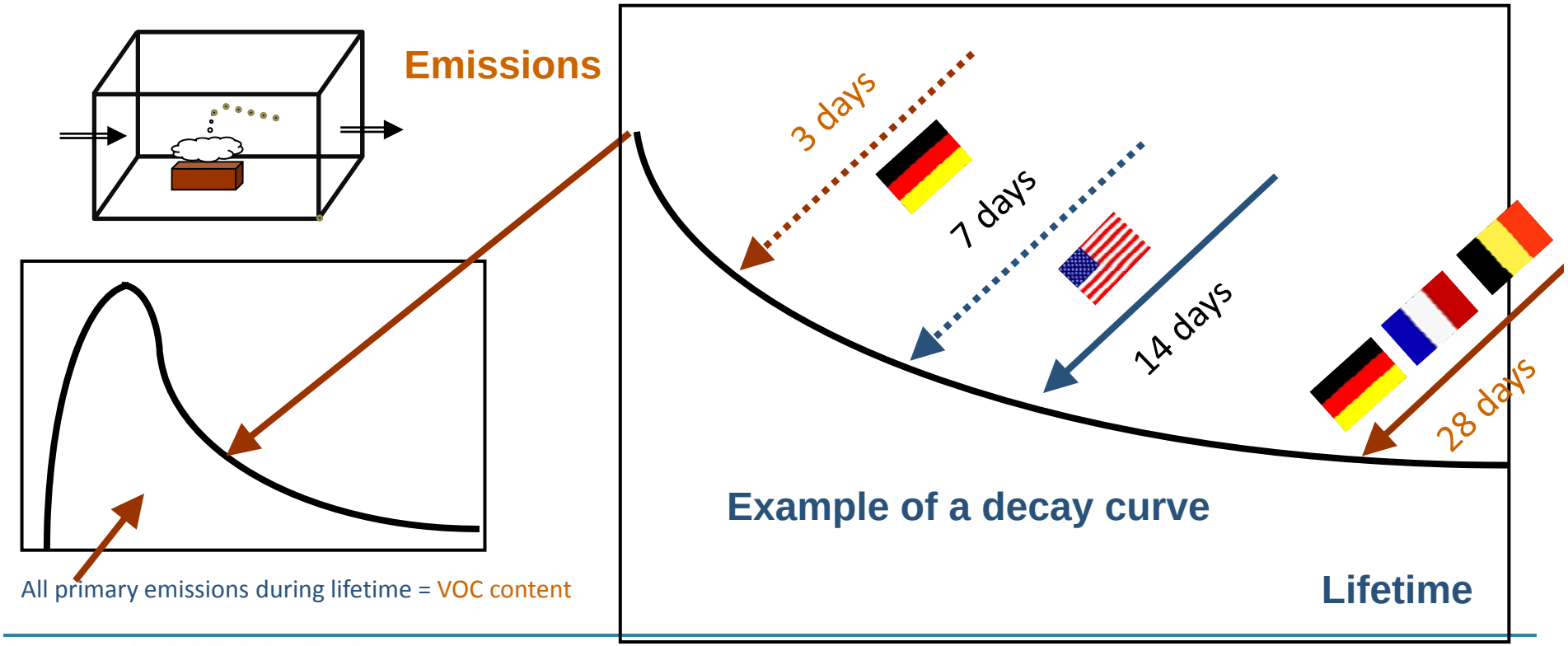
- EU ecolabel, Swiss Umweltetikette, Blue Angel, Indoor Air Comfort:
  Limits in g/l VOC in the ready-to-use product; specific limits depend on product type.
  - No workable test method was specified
    - Required: ISO 11890-2, extraction then GC
      - but this specifies only VOC testing, not SVOC testing
    - Also proposed: Headspace-in-can testing ISO 17895
      - but this is NOT possible for SVOCs
      (these are not volatile enough for this evaporation based test)
  - Solutions:
    - European Paints Manufacturers Associations CEPE published a guidance for harmonized testing as intermediate solution until ISO 11890-2 is published.
    - EU ecolabel User manual is planned to contain similar recommendations (soonest).
    - Amendment of ISO 11890-2 is planned (initiated by Eurofins).

VOC emissions testing

- A test specimen is prepared
  from a representative sample in a representative manner.
- The specimen is placed into a ventilated test chamber (stainless steel or glass) with surface / volume ratio similar to standard room conditions.
- Air is drawn from chamber exit through sampling tubes at distinct points of time
  - Different tubes for different substances
  - Sampling duration is 1 – 2 hours
- Main testing standards
  - prEN 16516
  - ISO 16000 parts 3, 6, 9 and 11, EMICODE, EN 717-1, DIBt
  - ASTM D5116, CDPH SM v1.1, BIFMA M7.1

VOC emissions and VOC content

- VOC content not correlated at all with in-use emissions
  - Evaluation mostly after 28 days in Europe, after 14 days in USA
  - Limits after 3 days cover renovation / refurbishing
  - Testing in ventilated test chambers; no correlation with VOC content
  - Normally emissions decrease over time



Test chambers

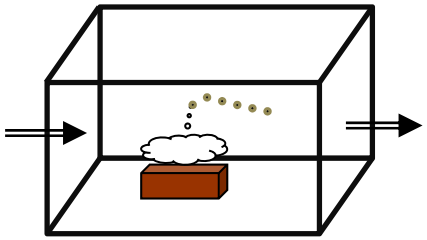
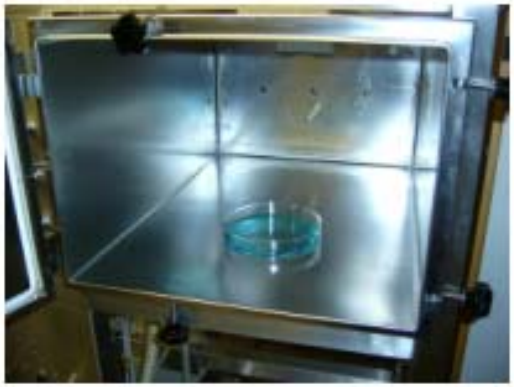


Photo: Eurofins Product Testing A/S

Emission Testing: VOC, formaldehyde …

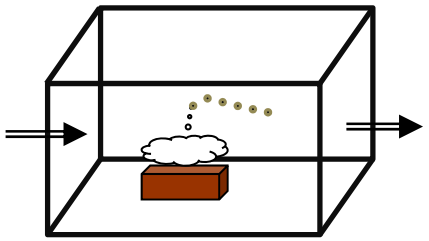
Photo c: Eurofins Environment A/S



Significance of test result

- What you get from chamber testing is:

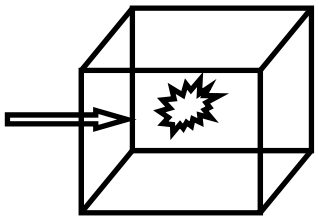
Test chamber air concentration at given time mg/m³,
then we calculate from that:



- Emission rate per hour, mg/h
- Specific emission rate (emission factor),
  - per area mg/m²h
  - or per mass, per device, per unit
- Contribution to air concentration, mg/m³ (source strength)
  in reference room (or in real room) after a specified time
- **Compare with limit values (almost always given as air concentration)**

European Reference Room

- Reference room - not a test room, but just a model
  - Needed for comparing test result with air concentration limit values
  - European Reference Room (CEN TC 351 / prEN 16156):
    - Floor area 12 m^2, Height 2.5 m, Volume 30 m^3
    - 1 window, 1 door
      - From that we calculate loading factors (m^2/m^3) for walls etc.
    - ½ air change per hour
    - 23 °C, 50% relative humidity
    - As most products can be used in various exposure scenarios, this room is used as general reference for all situations



- Testing shall simulate those rooms in small scale
  - Test chambers made of stainless steel or glass, 50 litres to several m^3

European programs
to characterize
low VOC and low emitting products

National Regulations

- Germany: Respect the limit values, then approval by DIBt agency and carry Ü mark

- Belgium:
  Respect the limit values

- France,
  VOC class label

Voluntary labels

- Voluntary labels "on Top":
  - Regulatory specifications = Minimum requirements
  - Voluntary labels = very low emitting products
  - Very most labels are strictly national
- Market evaluation
  - will determine whether an individual manufacturer will use such labels or not
- Organization of voluntary labels:
  - Proof of compliance by testing and by declaration of properties
  - Application for a license against a fee
  - No use of the label without a license
  - Most labels: Testing of a sample every 5 years (if at all).
  - In Europe only for Indoor Air Comfort:
    - Higher reliability with annual Third-Party inspection of production site, and re-testing
    - This is more normal in the US (FloorScore, Indoor Advantage, UL Greenguard)

Low VOC emissions rating schemes

EU Regulation:

- Germany (DIBt / AgBB)
- Belgium
- French label and CMR
- CE marking
- EU Decopaint (VOC *content*)

EU Labels & Specifications:

- Indoor Air Comfort
- EMICODE
- GUT
- EU ecolabel
- M1, Finland
- Blue Angel, Germany
- Several local labels

US Regulation:

- Formaldehyde (CARB, federal law)
- VOC *content* (SCAQMD and more)

US Labels:

- California CDPH "Section 01350"
- Indoor Advantage
- Cradle-to-Cradle
- UL Greenguard
- Sustainable Building programs, e.g. LEED, CHPS

Indoor Air Comfort – product certification

- Certificate = VOC Emissions are sufficiently low for application to all national low VOC programs in Member States of the EU
- Differentiation between good product and better product:
  - Indoor Air Comfort

    Low emissions, conform with all governmental specifications in Member States of the EU:

    AgBB, French class A or better, Belgium
  - Indoor Air Comfort GOLD

    Very low emissions, conform with most voluntary specifications in Member States of the EU - most stringent label in the market:

    French class A+, M1, Blue Angel, Austrian UZ, GUT, EMICODE EC1 or better, …
- Covers only product emissions into Indoor Air
  - And VOC content for wet products when applied
- Includes testing, annual re-testing, and Third-Party inspection of production

Lists with approved compliant product rating schemes

LEED - Intervention:

Sara Cederberg

BREEAM:

Reinhard Oppl

Facilitate Identification of compliant products

- LEED and BREEAM
  - Reference to specific VOC and formaldehyde limit values and corresponding testing methods.
  - In Europe many low and very low emitting products carry other labels than those referenced.
  - A significantly larger number of low-emitting products are available for LEED or BREEAM certified construction sites
    - if all available information sources are used to identify low-emitting products
    - then without the need and costs of new testing.
- US GBC published a list of product rating schemes that show LEED conformity:

  (Link: www.usgbc.org/resources/low-emitting-materials-third-party-certification-table)

  or google for "LEED Low-Emitting Materials Third Party Certification table")

LEED® v4 – low emissions – product labels

- Product rating schemes that show LEED conformity, examples of list by US GBC:

Certification or Program	Program Documents and Revision Dates	Testing Standard Referenced in Credit	Emissions and Content Requirements Eligibility			
			General Emissions Evaluation	VOC Content for Wet-Applied	Composite Wood Evaluation	Furniture Evaluation
Indoor Air Comfort GOLD	Indoor Air Comfort v3.1 August 2011	AgBB	Yes (including the additional low formaldehyde requirement)			
GUT	GUT Test Criteria 2011	AgBB	Yes textile floorings (including the additional low formaldehyde requirement)			
EMICODE	2010/07/28	AgBB	Yes flooring installation products and parquet coatings (excluding the additional low formaldehyde requirement, but formaldehyde = max 50 µg/m³ already after 3 days)	Yes (max 0.5 % solvents = circa max 5 g/l; with the exception of parquet coatings: max 8 % solvents = circa max 80 g/l)		

LEED® v4 – low emissions – product labels

- Product rating schemes that show BREEAM conformity, see http://www.breeam.org/page.jsp?id=718:


BREEAM®

www.breeam.com

Guidance Note

V1.0 August 2015

GN22: BREEAM Recognised Schemes for VOC Emissions from Building Products

Introduction

Within the Health and Wellbeing category of some BREEAM schemes, credits are awarded for compliance with criteria for 'volatile organic compound (VOC) emission levels (products)'. This involves meeting VOC emission level performance requirements in accordance with compliant performance and testing standards. The BREEAM compliant performance and testing standards are based on current European (EN) and International (ISO) standards.

The purpose of this Guidance Note is to publish a list of alternative standards/schemes that show equivalent or better performance than the current BREEAM criteria, and therefore can be used to demonstrate compliance with the criteria. This note should be read in conjunction with the relevant assessment issue guidance provided in the appropriate BREEAM scheme technical manual.

- BREEAM International plans a basic revision of the criteria for low emitting products early in 2016

LEED® v4 – low emissions – product labels

- Example:

Product Type	Approved Alternative VOC Scheme
Resilient, textile and laminated floor coverings	— GREENGUARD Certified/GREENGUARD Gold — FloorScore® — French VOC Regulation – Class A+/Class A/Class B — AgBB — M1 Emission Classification of Building Materials — Green Label Plus™ — GUT — Indoor Air Comfort© / Indoor Air Comfort Gold©

- BREEAM International plans a basic revision of the criteria for low emitting products early in 2016

Identification & Verification of compliant products for LEED and for BREEAM projects

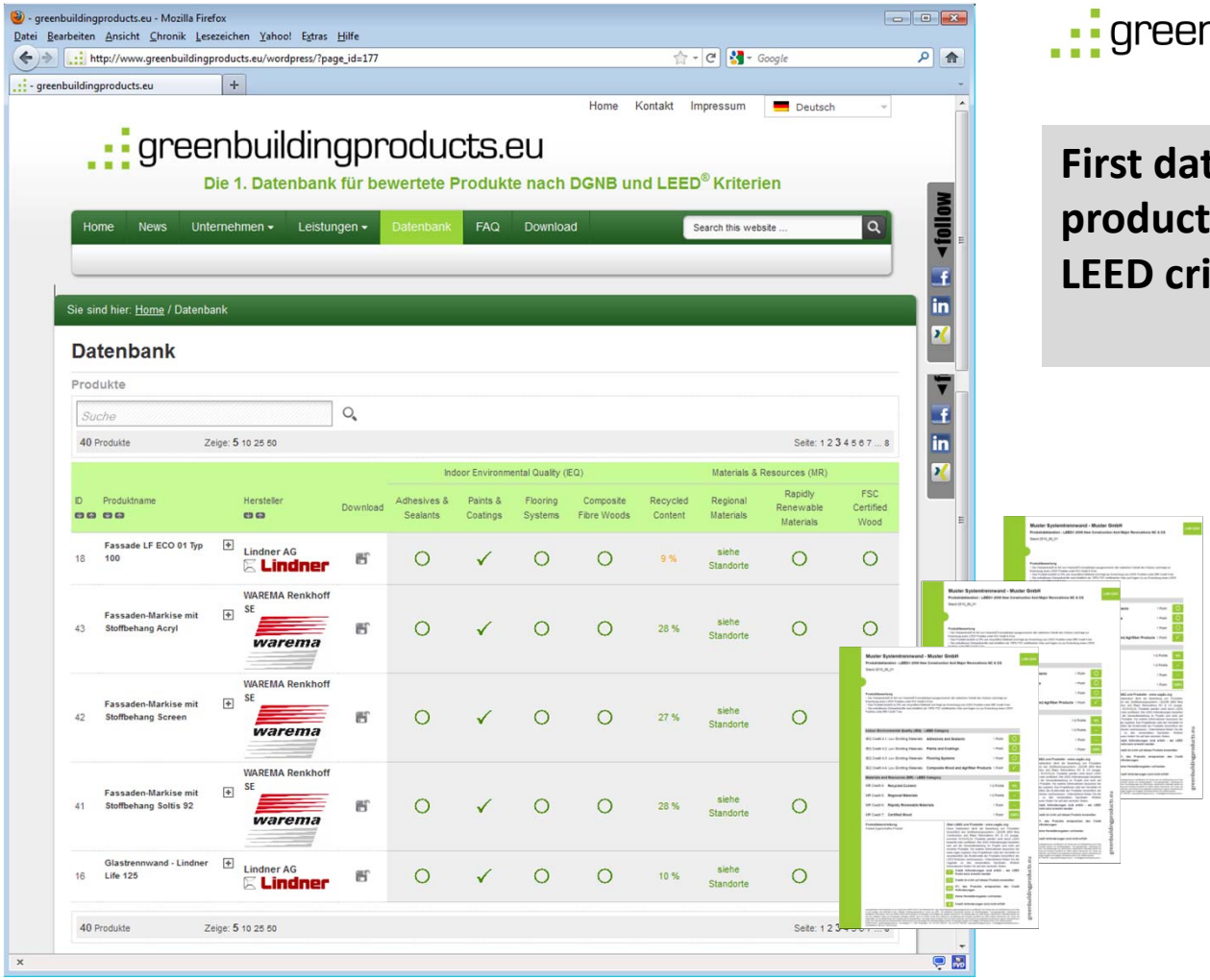
Find and verify compliant products

1. Search in LEED/BREEAM documents:
   a. Are there criteria for the specific product type?
   b. Which criteria? (VOC emissions, VOC content, other)
   c. Which rating schemes are accepted as direct proof of compliance?
2. In purchase specifications:
   a. Request documentation on (1b) or (1c).
3. To verify delivered claims of compliance:
   a. Test reports: Lab must be ISO 17025 accredited and VOC testing must be covered by that accreditation (ISO 9001 certification is not good enough)
   b. Labels: Ask for the license document. Verify with the issuer if in doubt.
   c. Require that described product and purchased product conform.
   d. Request emissions test if in doubt, or if documentation more than 2-3 years old.
4. Search in relevant product database.
   a. An example is presented next.

Database with LEED and DGNB compliant products
Intervention:
Thomas Hoinka

Standardized Product Evaluation / Database & Tools

www.greenbuildingproducts.eu



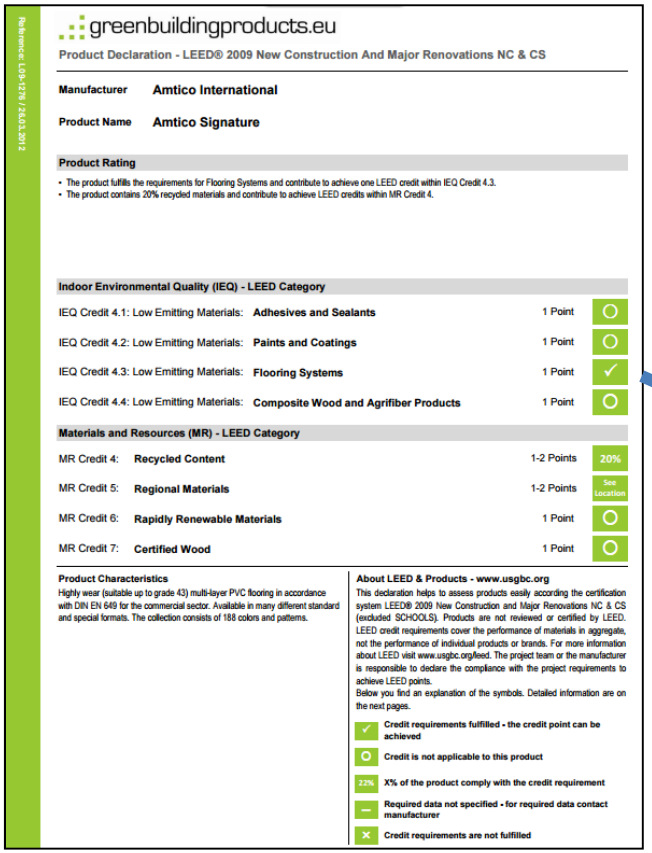
greenbuildingproducts.eu

First database that evaluates products regarding DGNB and LEED criteria.

LEED Submission through transparent Declaration

Manufacturer LEED Factsheets simplifies LEED documentation for all

Fact Sheet with required data



greenbuildingproducts.eu

Product Declaration - LEED® 2009 New Construction And Major Renovations NC & CS

Manufacturer **Amtico International**

Product Name **Amtico Signature**

Product Rating

- The product fulfills the requirements for Flooring Systems and contribute to achieve one LEED credit within IEQ Credit 4.3.
- The product contains 20% recycled materials and contribute to achieve LEED credits within MR Credit 4.

Indoor Environmental Quality (IEQ) - LEED Category

IEQ Credit 4.1: Low Emitting Materials:	**Adhesives and Sealants**	1 Point	○
IEQ Credit 4.2: Low Emitting Materials:	**Paints and Coatings**	1 Point	○
IEQ Credit 4.3: Low Emitting Materials:	**Flooring Systems**	1 Point	✓
IEQ Credit 4.4: Low Emitting Materials:	**Composite Wood and Agrifiber Products**	1 Point	○

Materials and Resources (MR) - LEED Category

MR Credit 4:	**Recycled Content**	1-2 Points	20%
MR Credit 5:	**Regional Materials**	1-2 Points	See Location
MR Credit 6:	**Rapidly Renewable Materials**	1 Point	○
MR Credit 7:	**Certified Wood**	1 Point	○

Product Characteristics

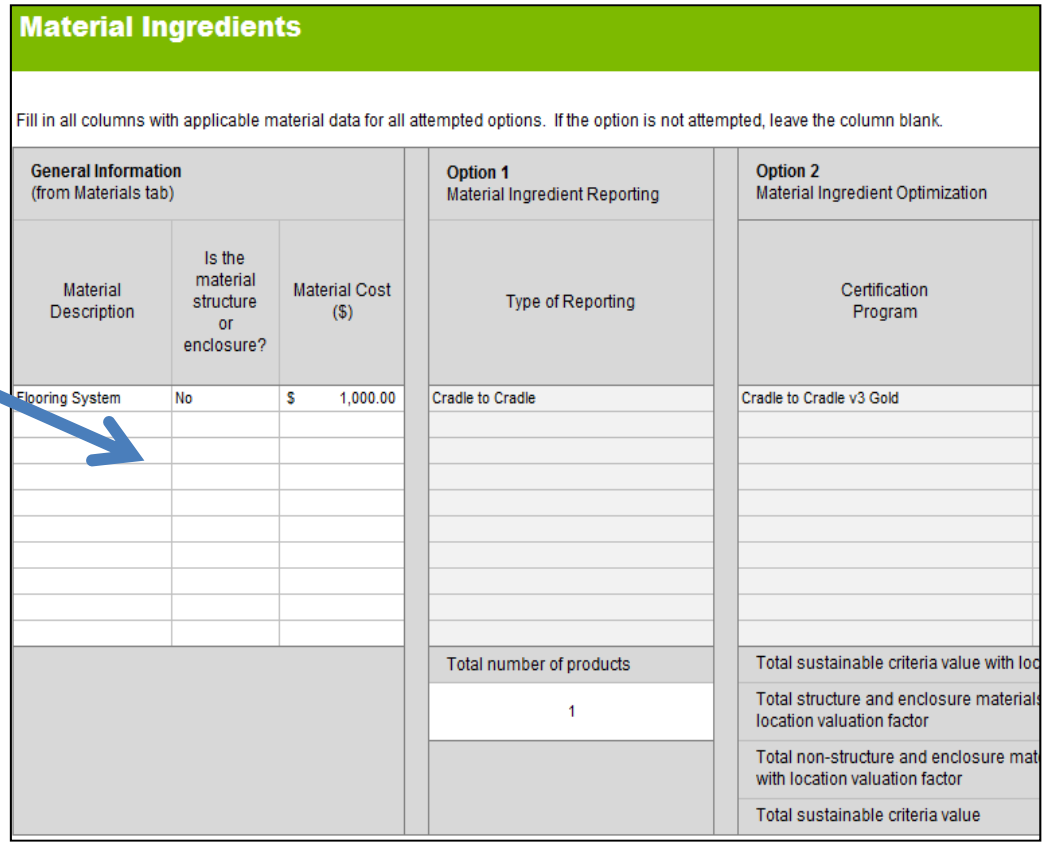
Highly wear (suitable up to grade 43) multi-layer PVC flooring in accordance with DIN EN 649 for the commercial sector. Available in many different standard and special formats. The collection consists of 188 colors and patterns.

About LEED & Products - www.usgbc.org

This declaration helps to assess products easily according the certification system LEED® 2009 New Construction and Major Renovations NC & CS (excluded SCHOOLS). Products are not reviewed or certified by LEED. LEED credit requirements cover the performance of materials in aggregate, not the performance of individual products or brands. For more information about LEED visit www.usgbc.org/leed. The project team or the manufacturer is responsible to declare the compliance with the project requirements to achieve LEED points.
Below you find an explanation of the symbols. Detailed information are on the next pages.

- ✓ Credit requirements fulfilled - the credit point can be achieved
- ○ Credit is not applicable to this product
- 22% X% of the product comply with the credit requirement
- – Required data not specified - for required data contact manufacturer
- × Credit requirements are not fulfilled

LEED Tool: BPDO / Low-Emitting Materials Calculator



Material Ingredients

Fill in all columns with applicable material data for all attempted options. If the option is not attempted, leave the column blank.

General Information (from Materials tab)			Option 1 Material Ingredient Reporting	Option 2 Material Ingredient Optimization
Material Description	Is the material structure or enclosure?	Material Cost ($)	Type of Reporting	Certification Program
Flooring System	No	$ 1,000.00	Cradle to Cradle	Cradle to Cradle v3 Gold

Total number of products	Total sustainable criteria value with loc
1	Total structure and enclosure materials location valuation factor
	Total non-structure and enclosure mat with location valuation factor
	Total sustainable criteria value

Required data can be transferred to LEED tools easily.

Challenges for architects, designers & construction companies

Advantages of Product Database and LCA Tool

Manufacturers

- Competitive advantage
- Positive image through verified fulfillment of sustainability criteria

Clients, Designers, Contractors, LEED AP's, DGNB Auditors

- Time savings in the product search → more efficient
- Planning security in green building projects

Certification organizations DGNB & LEED

- Easier conformity check through transparent product declarations and provision of all necessary information

Identification of low-emitting interior products for LEED and BREEAM

Agenda

- The role of low VOC and low emitting products in LEED and BREEAM.
- VOC product requirements set out in LEED version 4.
- VOC product requirements set out in BREEAM.
- Basics on VOC testing and emissions testing.
- European programs to characterize low VOC and low emitting products.
- To which extent LEED and BREEAM will accept these labels as compliance path.
- How can project planners identify and verify compliant products for LEED and for BREEAM projects.
- Database containing compliant products.
- Outlook and Discussion

Identification of low-emitting interior products for LEED and BREEAM

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- Further reading and updates:
  www.eurofins.com/leed,
  www.eurofins.com/breeam,
  voctesting.wordpress.com