



Selection of the right low VOC label from the huge offer in the market

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... allows working with VOC regulation and ecolabels in many countries



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**Galten, Denmark
close to Arhus**

- CE mark
- European ecolabel
- DIBt / AgBB, Germany
- French VOC regulations
- AFSSET, France
- PRODIS/GUT, Europe
- EMICODE, Europe
- M1, Finland
- Blue Angel, Germany
- Ecolabel, Austria
- Indoor Air Comfort, Europe
- Danish Indoor Climate Label
- Natureplus
- LGA label, "Golden M", TÜV labels, Nordic Ecolabel, ...
- CertiPUR, Europe
- CertiPUR US
- California CDPH Section 01350
- FloorScore, USA
- ANSI/BIFMA, USA
- Indoor Advantage, USA
- CRI Green Label Plus, USA
- Greenguard, USA
- Green Label, Hong Kong
- ...
- Green Building rating schemes with low VOC criteria:
LEED, BREEAM, HQE, DGNB, Green Star Australia, ...

- **Summary of most important regulations and ecolabels**
 - **Europe**
 - **USA**
 - **Sustainable Building programs**
- **Grouping by product type, by country etc.**
- **Summary**

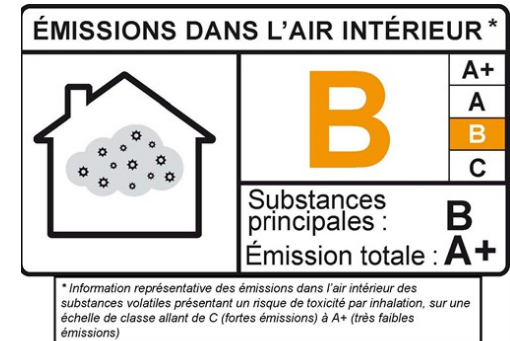
- Valid for many constructions products:
 - **CE mark = prerequisite for being sold in EU (if applicable)**
- Goal of CE mark: Common language for product information in whole Europe
- CE mark = basic requirements, declared by manufacturer or certified by Third Party, often with performance classes
- Basis is a mandate from European Commission, given to CEN
 - Product specific CEN Technical Committee then issues a performance standard
- Compliance with that standard allows use of CE Mark
 - VOC emissions are not yet part of CE mark specifications
 - EU Commission intends to include VOC emissions in several norms for CE marking, e.g. those on floor coverings

- European ecolabel (also called EU "Flower" due its logo) is having long lists of criteria for several products and services
- Some of these include requirements on emissions of VOC and formaldehyde into indoor air, such as criteria for:
 - Textile floorings, Wooden floorings, Mattresses
 - VOCs are limited after 3 days.
- Another two criteria contain specifications on VOC content:
 - Indoor and outdoor paints and varnishes
- Importance on most markets: **LOW**



- AgBB: Task force of German health authorities issued a paper on limitation of VOC emissions from construction products.
 - Just an opinion, nothing more
- DIBt: Authority for approval of use of construction products in German rooms where people will stay more than short time.
- You can sell products in Germany without DIBt approval, but nobody must use non-approved products in such rooms.
- Product recipe shall be documented to DIBt. Some chemicals are prohibited. VOCs are limited after 3 days and after 28 days.
- Strong influence in German speaking countries.
Several other labels rely on the same approach, e.g. Blue Angel, GUT, EMICODE EC1 PLUS, and more.
- AgBB approach influences discussion also in other EU countries.

- Regulations on CMR compounds
 - No selling in France if any compound out of
 - Benzene, trichloroethylene, DEHP, DBP emits max. 1 µg/m³ each, when tested with ISO 16000
 - In force since January 2010 = **compulsory**.
- **Compulsory** VOC emissions labelling:
 - Emissions classes C, B, A, A+
 - Emissions after 28 days
 - Limits are set for 11 VOCs, and TVOC
 - **Launch planned late 2010 – label compulsory not before 2013**
- For both regulations: Knowledge of emissions is required,
 - testing is not necessary if you know without a test
- No approval bureaucracy – self-declaration by manufacturer



- **AFSSET: Task force of French health and environmental authorities issued a paper on limitation of VOC emissions from construction products.**
 - **Just an opinion, nothing more**
 - **Very similar to German AgBB, but with lower limit values for several VOCs**
 - **VOCs are limited after 3 days and after 28 days.**
- **No French authority uses this paper for establishing a regulation.**
- **Completely voluntary use in France**
 - **but in some segments of construction industry, architects and building owners require AFSSET complying products.**

- **PRODIS: Database with information on textile floorings.**
- **GUT: Is a part of this information, dealing with chemicals.**
 - **Some dangerous ingredients in the product are excluded.**
 - **GUT uses AgBB but with testing after 3 days only, with lower limit values than AgBB, and with a simple odor test.**
- **Influence of GUT decreased average emissions and odors of textile floorings over past decades.**
- **Large part of textile floorings in Europe now are GUT labeled.**
- **Use of GUT label is voluntary but gives market advantage in Europe, mainly for use in professional building sector.**

- **EMICODE (after updates in 2010):**
Valid for flooring adhesives, leveling screeds, primers, underlays, parquet varnishes, joint sealants, window sealings, ...
 - Some dangerous ingredients in the product are excluded.
 - Same VOC emissions limit values apply for all products after 3 / 28 days (only parquet varnishes are different)
- **Different classes: EMICODE EC2 (*low VOC emissions*), EC1 (*very low VOC emissions*), EC1^{PLUS} (*very low VOC emissions*)**
 - EMICODE EC1^{PLUS} is similar to AgBB (with lower TVOC limits);
EMICODE EC1 and EC2 just are limiting TVOC, TSVOC and carcinogens.
- **Use of EMICODE decreased strongly emissions from adhesives over past decades.**
- **Most flooring adhesives in Germany are EMICODE EC1 or EC1^{PLUS}.**
- **Use of EMICODE label is voluntary but gives market advantage in Europe, mainly for use in professional building sector.**

- M1: In use for many construction products
- M2 class with higher emissions is offered, but is not used in reality.
- VOC emissions limit values after 28 days:
TVOC, formaldehyde, ammonia, odor
- Use of M1 decreased strongly emissions from construction products in Finland over the past decades.
- Important part of construction products in Finland now are M1 labeled.
- Use of M1 label is voluntary but gives market advantage in Finland, mainly for use in professional building sector.

- Blue Angel is one of the oldest and largest ecolabels.
- Many Blue Angel criteria are specified for products where VOC is out of interest, e.g. energy saving lamps.
- Some criteria include requirements on emissions of VOC and formaldehyde into indoor air:
 - Textile floorings, Resilient floorings, Mattresses, Adhesives, Sealants, Insulations, Wooden toys, Furniture, ...
 - VOC limits differ per product group, most times VOC is limited after 3 and 28 days, similar to AgBB/DIBt but with lower limit values.
- Other criteria contain specifications on VOC content, e.g. paints
- **Voluntary label. Importance on market: Different by product group. If relevant, then mostly in German speaking countries.**



- Many Umweltzeichen criteria are specified for products where VOC is out of interest.
- Some criteria include requirements on emissions of VOC and formaldehyde into indoor air:
 - Textile floorings, Resilient floorings, Wooden floorings, Mattresses, Furniture, ...
 - VOC limits differ per product group, most times VOC is limited after 3 and 28 days.
- Other criteria contain specifications on VOC content, e.g. paints
- **Voluntary label. Importance on market:**
Different by product group. If relevant, then only in Austria.

- Special VOC related label for several product groups (construction products, furniture, ...).
- Emissions evaluation looks only at those VOC that are listed in a Danish database with irritation threshold limits ("VOCBASE").
- Time (in days) is calculated when $\frac{1}{2}$ of each irritation threshold is reached in a model room. Then also an odor test has to be passed.
- Earlier also $\frac{1}{2}$ odor threshold was included in the evaluation, but this was dropped recently.
- Voluntary label. Importance on market:
Different by product group. If relevant, then only in Denmark.

- Special ecolabel for several groups of ecological construction products (with high content of mineral or renewable raw material).
- Some dangerous ingredients in the product are excluded or limited.
- VOC limits differ per product group, most times VOC is limited after 3 and/or 28 days, more and more similar to AgBB/DIBt with lower limit values.
- **Voluntary label. Importance on market:**
Still limited, but growing importance for ecological construction.

- Several private ecolabels are issued by special test houses or by trade associations for specific product groups:
 - LGA mark, TÜV mark, Golden M, Swedish declaration of construction products ...
- Some dangerous ingredients in the product are excluded or limited.
- VOCs limits differ per product group, most times VOC is limited after 1 and/or 3 and/or 28 days.
- **Voluntary labels. Importance on market:**
Mostly small, but in some cases such a label may be required in procurement documents.

- Private label with some special properties:
 - Most focus on emissions into indoor air
 - No further restriction of substances than those given by law
 - Additional reliability of low VOC emissions statement is given by certification (including on-site audits, re-testing)
 - Basic level: Combines all legal requirements in Europe; the lowest limit value of each country is selected.
 - GOLD level: Combines most voluntary requirements (ecolabels) in Europe; the lowest limit value of each label is selected. *(some special labels such as the Danish label have not been considered)*
- Applicable for several construction products and furniture.
- Voluntary label. Importance on market:
Still small – the label is new and just was launched in 2010 only.



CDPH = California Department of Public Health

- Developed as purchase criteria in California
- Based on VOC emission testing
 - First 10 days storage, then 4 days in test chamber
 - Results are calculated for class room and for office room
- Testing:
 - After (in total) 11, 12 and 14 days
- Evaluation after 14 days:
 - Limit values: ½ of CREL (chronic respiratory exposure levels)
 - 35 VOCs are on CREL list of 2010
 - No TVOC limit value in California
- Revision is on-going in 2010
- Voluntary label. Importance on market:
 - in LEED sustainable building projects.
 - in California and in parts of the USA.

- Ecolabel for non-textile floor coverings
- Testing and limit values: Copy of CDPH Section 01350
- Includes not only testing, but also certification
(including on-site audits of manufacturing process, and re-testing)
- Voluntary label. Importance on market:
 - in LEED sustainable building projects.
 - in California and in parts of the USA.

- Ecolabel for office and institutional furniture (including e.g. schools)
- Testing: After 3 and 7 days, then extrapolation to emissions after 14 days
- Limit values for: TVOC, formaldehyde, acetaldehyde, and 4-phenylcyclohexene after 14 days
- Includes not only testing, but also certification (including on-site audits of manufacturing process, and re-testing)
- **Voluntary label. Importance on market:**
 - in LEED sustainable building projects.
 - in California and in parts of the USA.

- Ecolabel for several construction products and furniture
- Indoor Advantage basic level and Gold level
- Includes FloorScore and BIFMA testing and limit values, but not only testing, also certification (including on-site audits of manufacturing process, and re-testing)
- Voluntary label. Importance on market:
 - in LEED sustainable building projects.
 - in California and in parts of the USA.

- Ecolabel for textile floor coverings
- Testing and limit values:
 - First test after 1 and 14 days,
14 days limit values for a list of VOC but no TVOC
 - Annual testing after 1 day,
limit values for a list of VOC and for TVOC
 - Quarterly re-testing only TVOC after 1 day
- Includes not only testing, but also certification
(including on-site audits of manufacturing process, and re-testing)
- **Voluntary label. Importance on market:**
 - in LEED sustainable building projects.
 - in California and in parts of the USA.

- Ecolabel for several construction products, furniture, cleaners
 - Two levels: Greenguard Product Certification, and Greenguard Children & Schools Certification
- Testing:
 - After 6 hours, then after 1, 2, 3, 4 and 7 days
 - Annual and quarterly simplified re-testing
- Limit values, evaluated after 7 days:
 - TVOC, carcinogens, and a list of VOCs,
Includes not only testing, but also certification
(including on-site audits of manufacturing process, and re-testing)
- **Voluntary label. Importance on market:**
 - in parts of the USA.

- **Several other labels include low VOC emissions requirements**
 - e.g. Green Label Hong Kong or Green Label China
 - Most of these specify TVOC limit value without specifying after which time this limit value shall be respected
- **Some regulations and labels limit VOC content, not VOC emissions**
 - e.g. Decopaint Directive, SCAQMD VOC content limits (South California), Green Seal, ...
- **Some regulation goes only for formaldehyde**
 - E1 formaldehyde class (developed for wood-based panels, now also used with CE marking of wooden floorings, and for some insulation foams)
 - CARB – Californian limitation of VOC emissions from wood-based panels, just recently taken over as US-wide national regulation; mostly lower limit values than in Europe
 - Japanese regulation, allowing only low formaldehyde emitting products (F****) in buildings without limitations

- Large variety of sustainability rating systems exists
 - Only some of these include product VOC requirements, such as **LEED (USA, Italy, ...), BREEAM (UK), HQE (France)**
- Products can NOT be certified
 - Building projects earn points for achieving high ranking, e.g. for energy saving
 - Use of low VOC products can help earning some points by fulfilling specifications, “credits”, on low VOCs
 - Product testing may deliver essential documentation for showing compliance with these credits
 - Final decision on acceptance is with a building auditor
- As an example – the US GBC® logo on a product means nothing more than:
 - Manufacturer is member of US GBC® organization.
- **LEED compliance is required for purchase of construction products more and more often in USA, Asia, and Europe.**



Selection of most appropriate low VOC rating schemes depends on where and how a manufacturer wants to sell his products:

- In which countries?
- For which sustainable buildings system?
- For which type of products?
- On which level of low VOC ambitions?

The following 4 slides contain some overview over regulations and labels per products, per country, and per ambition level.

Final decision depends on the individual plans of each company.

For consulting on best selection, please email to:

voc@eurofins.com,

or ask other experts.

Per country:

■ Pan-European:

- Indoor Air Comfort, EMICODE, GUT, EU ecolabel, Natureplus, Formaldehyde E1 class

■ Germany, Austria:

- AgBB/DIBt, Blue Angel, Austrian ecolabel

■ France:

- French VOC regulations
- AFSSET

■ Scandinavia:

- M1, Swedish Construction Products Declaration, Danish label

■ USA:

- CDPH Section 01350, Indoor Advantage, FloorScore, CRI Green Label Plus, BIFMA, Greenguard

Per sustainable building rating system:

- **LEED USA:**
 - CDPH Section 01350, FloorScore, CRI Green Label Plus, BIFMA
- **LEED Italy:**
 - EMICODE EC1, Decopaint Directive CDPH Section 01350, FloorScore, CRI Green Label Plus
- **HQE (France):**
 - AFSSET, EMICODE, AgBB, GUT, M1, Formaldehyde E1 class
- **BREEAM (UK):**
 - Main requirement: Formaldehyde E1 class

Per product group, examples:

■ Floorings:

- GUT, AgBB/DIBt, French VOC, AFSSET, M1, Blue Angel, Austrian label, Danish label, Natureplus, Indoor Air Comfort, FloorScore, Indoor Advantage, CRI Green Label Plus, Greenguard

■ Adhesives, sealants:

- AgBB/DIBt, French VOC, AFSSET, M1, Blue Angel, Natureplus, Indoor Air Comfort, CDPH Section 01350, FloorScore, Indoor Advantage, CRI Green Label Plus, Greenguard

■ Furniture:

- Blue Angel, Austrian label, Indoor Air Comfort, CDPH Section 01350, Indoor Advantage, BIFMA, Greenguard

■ Wood-based panels:

- Formaldehyde E1 class, CARB, F**** regulation

- **Lowest limit values:**
 - **EMICODE EC1 and EC1^{PLUS}, GUT, Natureplus, EU ecolabel, Indoor Air Comfort GOLD**
- **Medium range:**
 - **AFSSET, M1, some Blue Angel criteria, Austrian ecolabel, Danish label, Greenguard**
- **Less strict limit values:**
 - **AgBB, CDPH, FloorScore, BIFMA, Indoor Advantage, Indoor Air Comfort**
- **Exception - formaldehyde:**
 - **Lowest limit values in France and in California**
(10 µg/m³ emissions after 28 days in France,
and in California (Section 01350) 16.5 µg/m³ now, but 9 µg/m³ from 2012 on)

Save costs if you need several labels:

- If the testing lab is approved by all labels relevant for a manufacturer, then one combined test is possible including most regulations and ecolabels
- Costs saving comes from:
 - Use of test chamber only one time
 - Chamber air sampling and analysis can be used for different labels if all these require sampling at the same time, e.g. after 28 days
 - One example:
Combine AgBB + French VOC regulation + AFSSET + EMICODE + California CDPH in one test run:
Air analysis after 3, 11, 12, 14 and 28 days.
- **Most involved labels still will require their license fees, but testing costs can be reduced this way.**

More information, and links to original documents,
is available at our homepage:

- www.product-testing.eurofins.com/ecolabels.aspx

Regular updates can be seen in several blogs, e.g. at WordPress.

- Links to VOC blogs can be found here:
www.product-testing.eurofins.com/voc-blogs.aspx

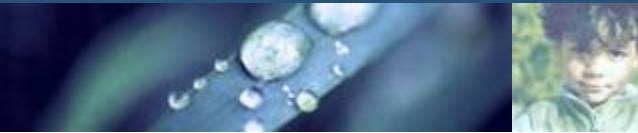
Seminars for more detailed information on this issue are offered in
English and in German in December 2010.

- For details:
www.product-testing.eurofins.com/voc-events.aspx

**Use existing information and expertise,
and make a good plan on where and how
you may need low VOC emission specifications**

—

**then the variety of low VOC emissions specifications
can be handled in a somehow reasonable manner.**



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Please direct any questions to my email address:

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