

Product certification – a new tool for good indoor air quality

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1 Product emission testing

Improving indoor air quality concerns construction design and processes, ventilation, material development and limitation of emission of volatile organic compounds (VOCs) from materials. More and more buildings are built sustainable. Besides saving energy and resources, also healthy indoor air and use of low emitting products help rating a building as „green“. Product emission testing can show low impact of a product on indoor air quality for compliance with

- legal limit values set up by national authorities e. g. in Germany, Japan and California;
- requirements for different product groups specified by various ecolabels such as M1, Blue Angel, EMICODE, GUT,

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BIFMA, Floor Score, CRI Green Label Plus, Section 1350, etc. [1; 2];

- specifications of down-stream users such as IKEA, and commissioners, e. g. for LEED certified buildings.

2 International harmonisation

The variety of existing low emission specifications for different product groups in different countries leads to unnecessary costs for double testing if a manufacturer has to show compliance with the specifications in several countries. Some variances and similarities in testing parameters and testing schedule are shown in the example overview in **table 1**.

Even though some harmonisation had been achieved, e. g. by using ISO 16000 standard series, remaining differences between national labels make testing expensive. Costs for testing different products could be reduced in future by making testing more similar and even comparable, as regards

Sampling/Testing	AgBB/DIBt (Germany)	M1 (Finland)	AFFSET (France)	LEED, Section 01350 (USA)
VOCs after 3 days	X	–	X	–
VOCs after 28 days	X *	X	X	–
VOCs at other dates	*	–	–	11d, 12d, 14d
Aldehydes 28 days	X	X	X	–
Aldehydes at other dates	*	–	–	11d, 12d, 14d
Ammonia 28 days	–	X	–	–
Odour test 28 days	–	X	–	–
LCI-like evaluation of specific VOC	X (NIK)	–	X (CLI)	X (CREL)

X: Test is required.

*: Test can be stopped after 3 or 7 days in case of low emissions.

Table 1. Comparison of some testing and evaluation schedules in Europe and the USA.

Indoor air comfort	Basic		Gold		
Limit values for test after ...	3 days	28 days	3 days	28 days	Unit
TVOCs _{DIBt}	10 000	1 000	1 200	160	µg/m ³
R _D -value (based on German NIK)	–	1	–	1	
R _F -Wert (based on French CLI)	–	1	–	1	
Total VOCs without German NIK incl. non-identified VOCs	–	100	–	100	µg/m ³
Total VOCs without French CLI incl. non-identified VOCs	–	100	–	100	µg/m ³
TSVOCs	–	100	–	40	µg/m ³
Total carcinogenic VOCs (C1, C2)*	10	1	10	–	µg/m ³
Any carcinogenic VOCs (C1, C2)*	–	–	–	1	µg/m ³
Formaldehyde ¹	–	120	–	40	µg/m ³
Ammonia ²			–	24	µg/m ³
Odour test _{M1} ²			–	≥ + 0.1	

* as far as detectable with this method

¹ Testing required only if product recipe does not exclude presence of formaldehyde – not for PO and PVC products

² Only if test report shall be used for Finnish M1 label

Table 2. Indoor air comfort specifications, criteria for resilient floor coverings as an example.

test chambers, testing climate, loading factor, time schedule of testing, and analysis. Even though no umbrella testing protocol is available, it is already possible to combine most European testing protocols, and even some US tests, into one test setup to a certain extent.

3 Increased reliability by certification

All European voluntary private labelling schemes [1] are based on just one initial test, data provided by the manufacturer, with repeated tests only after some years. Only GUT and EMICODE are performing additional market control testing for ensuring conformity of labelled products with the limit values.

Certification provides more – it is a forecast of low emission, based on continuous control, auditing and re-testing. This increases reliability and end-user trust in the promised properties. Certification is based on a contract between manufacturer and an independent certification organisation where manufacturer commit to ensure continuous low VOC emission of the certified products. Certification includes routine factory production control, third party auditing and (possibly simplified) repeated testing for ensuring a constant quality of the products of interest as concerns VOC emissions – or for allowing the manufacturer to react on unintended increase of product emissions.

All US labels such as CARB, CRI Green Label Plus, Floor Score, BIFMA and Greenguard are combining initial testing with auditing and repeated testing – such certification approach is the common way of doing in the USA. Within Europe, there are only few such certification systems in place. While European CE mark specifies limits only for formaldehyde emission (E1) for some product groups,

German DIBt authority established VOC emission limits based on AgBB testing scheme [3], as notified by the European Commission [4]. Non-wood flooring materials intended for installation in rooms for prolonged stay within Germany have to pass supplementary mandatory emission testing and certification for German Ü marking.

4 New certification approach

The new pan-European voluntary certification scheme „Indoor Air Comfort“, launched in late 2008, is combining national emissions specifications in the EU as kind of an umbrella label, including certification procedures. An example is shown in table 2. It allows to cover most national labels with one test, to fill gaps where no such label exists as of today, and to increase public trust by applying higher control intensity (third-party auditing and re-testing).

Literature

- [1] Harmonisation of indoor material emissions labelling systems in the EU. ECA Report No. 24. St.Stevens-Woluwe 2005.
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- [4] Principles for the health assessment of construction products used in interiors. <http://ec.europa.eu/enterprise/tris/pisa/cfcontent.cfm?vFile=120050255EN.DOC>, 2005.