

Specifications

Indoor Air Comfort and Indoor Air Comfort Gold

Version 7.0
May 2020



Eurofins Consumer Product Testing GmbH
Certification Body VOC
Am Neuländer Gewerbepark 4
21079 Hamburg
Germany
Phone: +49 40 492 94 - 6815

Eurofins Product Testing A/S
VOC Test Center
Smedskovvej 38
8464 Galten
Denmark
+45 7022 4276

Email: ccs@eurofins.com
Homepage: www.indoor-air-comfort.com

Introduction

This document contains the specifications for certification and labelling of building materials, decorative coatings and furniture with the labels Indoor Air Comfort or Indoor Air Comfort Gold.

This certification program is an additional quality tool for improving Indoor Air Quality, providing more security to consumer and to industry. The most efficient tool to ensure continuous low VOC emissions of a product is a combination of product testing, factory production control, and external surveillance of the emission relevant processes and parameters during production.

Therefore, Eurofins launched the "Indoor Air Comfort" (IAC) certification scheme that ensures manufacturers, retailers and end-users that product quality in terms of emission of volatile organic substances meets the relevant legal and most voluntary requirements for the involved product groups.

The core value of IAC certification by Eurofins is:

- Simplifying what is complicated by combining all relevant emissions specifications in use in Europe if certification criteria are fulfilled,
- Brand protection by establishing a management tool for monitoring and - if relevant - for reducing VOC emissions from certified products by external surveillance in combination with factory production control,
- Use of a low emission label for marketing purposes,
- Increasing public trust by low limit values and high control intensity (external surveillance and re-testing).

The approach of the label is to create a harmonized umbrella standard for various materials, combining the mandatory and voluntary requirements in Europe into one single specification. The same methodology and analytical techniques, as specified in international standards, are used in testing procedures for all involved products. This approach is another step towards harmonization and simplification in contrast to earlier, industry or national specific testing methodologies.

You can obtain the IAC certification for your products upon application. After a successful emissions test there will be a contract as well an initial inspection before granting the certificate. Re-inspections and re-testing will follow afterwards.

Hamburg / Galten, May 2020

Thomas Neuhaus
Head of Certification Body VOC

Małgorzata Anna Adamska-Reiche
Certification Service Manager

Table of content

1 Scope and application.....	4
2 Specifications.....	4
3 Use properties / Declaration	4
4 Emissions testing	5
4.1 Taking a sample	5
4.2 Preparation of a test specimen	5
4.3 Emissions testing	6
4.4 Air sampling	7
4.5 Air analysis	7
5 Evaluation	9
5.1 Indoor Air Comfort	9
5.2 Indoor Air Comfort Gold	9
6 Certification contract	10
7 Inspection and surveillance.....	10
8 Certification	10
9 Repetition of testing and inspections	11
10 Use of the label	11
11 Summary of the procedure	12
Annex I: Product specific requirements	13
A.1 Textile floorings	13
A.2 Resilient floorings	14
A.3 Wood-based floorings, skirting, panels and doors	15
A.4 Thermal insulation	16
A.5 Suspended (acoustic) ceilings	17
A.6 Gypsum boards	18
A.7 Installation products	19
A.8 Sealants	20
A.9 Paints, varnishes, floor coatings for the interior	21
A.10 Resin based liquid applied floorings	22
A.11 Furniture	23
A.12 Mattresses	24
A.13 Product systems	24
Annex II: Schemes and regulations covered by Indoor Air Comfort Gold	25
Annex III: Abbreviations	28
Annex IV: Revision table	29

1 Scope and application

This document contains specifications for building materials, decorative coatings and furniture with respect to certification and labelling with the labels Indoor Air Comfort or Indoor Air Comfort Gold.

The following materials are covered:

- Textile floor coverings,
- Resilient floor coverings,
- Wood-based floorings, skirting, panels and doors,
- Resin based liquid applied floorings,
- Insulation materials,
- Suspended ceilings,
- Gypsum boards,
- Adhesives, levelling compounds, primers, sealing, acoustic subfloors,
- Sealants,
- Paints, varnishes, coatings (used indoors),
- Combined product systems,
- Furniture,
- Mattresses,
- Other building materials.

2 Specifications

Classification of a product and issue of a certificate are based only on the results of emission testing and of the inspections at the manufacturing sites. The emission test is performed after 3 days and after 28 days in a ventilated test chamber following EN 16516 or comparable international standards. Any test result is extrapolated to an air concentration in the European Reference Room (EN 16516).

Abbreviations used in these specifications are listed in Annex III.

3 Use properties / Declaration

Any Indoor Air Comfort labelled product shall meet the legal requirements within the EU. Prohibited or restricted SVHC in REACH Annexes XIV and XVII shall not be used or not exceed the maximum allowed content as specified by REACH.

Further information on REACH: <https://echa.europa.eu/regulations/reach/understanding-reach>

Indoor Air Comfort labelled products shall meet the criteria of fitness for use as specified in the relevant European standards or comparable international standards. This shall be shown for the product, e.g. by correct use of a CE mark if available. Furthermore, a technical data sheet and installation instructions shall be available.

4 Emissions testing

4.1 Taking a sample

Determination of emission behavior shall be performed on freshly produced material at the earliest point of time when the product is ready for dispatch or application - this date may include essential storage periods.

Taking a sample of a product for testing shall be performed according to EN 16516, ISO 16000-11 or equivalent international or national standards. The product sample shall be packaged, as specified below, as soon as possible after collection and, in any case, within the same working day. The product sample shall arrive in the laboratory not later than 14 days after the date of sampling.

The maximum time between date of sampling and start of a test in the laboratory (incl. storage, transport, and storage at testing laboratory) shall not exceed 8 weeks provided that the laboratory sample is stored in the specified packaging. On-site wet-applied products coming in a closed container (can, cartouche) shall be tested not later than 4 months after sampling.

Samples taken shall be packaged airtight and be protected against contamination. A detailed documentation including sampling protocol shall follow the sample into the laboratory – templates will be supplied by Eurofins.

4.2 Preparation of a test specimen

Test specimen preparation prior to testing shall be performed as specified for the respective product – especially as defined in the respective EN product standard, as far as available. Specifications in national and international standards such as EN 16516, ISO 16000-11, EMICODE, EN 16402, M1, DIBt laboratory manual shall be taken into account.

Multi-layer systems are built up such as the manufacturer specifies for use at the construction site, including the required intermediate drying periods. If the manufacturers prepare the test specimen, then at least the top layer shall be installed at the testing lab just before start of the test.

Furniture is tested as a complete unit. In the case of large pieces of furniture, a representative subsample can be cut out, where the cut edges shall be sealed airtight before starting the test. The test results then shall be re-calculated to the whole unit.

4.3 Emissions testing

Emission testing shall be performed in a test chamber made of stainless steel as specified in EN 16516 at 23 (± 1) °C in the test chamber and 50 (± 3) % RH in the inlet air. Ventilation rate shall be 0.5 air changes per hour.

Other ventilation rates are accepted in the range 0.25 - 1.5 air change per hour if the test result is recalculated to 0.5 air changes per hour.

In line with European standardization and the normative European Reference Room for emission testing, the following loading factors shall be applied:

Table 1: European Reference Room (EN 16516)

	Dimensions
Length x width x height	4 m x 3 m x 2.5 m
Surface floor or ceiling	12 m ²
Surface walls	31.4 m ²
Surface window	2 m ²
Surface door	1.6 m ²
Volume	30 m ³

Table 2: Loading factors for building materials (EN 16516)

Intended use	Loading factor
Ceiling or flooring	0.4 m ² /m ³
Walls (<i>after rounding the value</i>)	1.0 m ² /m ³
Ceiling and walls	1.4 m ² /m ³
Small surfaces e.g. a door or a window	0.05 m ² /m ³
Very small surfaces, e.g. sealants	0.007 m ² /m ³

Allowed deviation from these values in test chamber is 50 % to 200 % of required loading. In case of such a deviation, the test result shall be re-calculated to the above specified value.

4.4 Air sampling

The emissions behavior is measured by sampling air from the outlet of the ventilated test chamber with sampling media and analytical procedures appropriate for the testing parameters as specified in EN 16516, ISO 16000-3 and -6. The limits of detection and quantification shall be applied as specified in EN 16516.

The test specimens shall remain stored in the test chamber during the whole testing period and shall be removed only after final air sampling from test chamber.

Air sampling shall be performed after 3 days and after 28 days in test chamber using Tenax TA adsorption tubes for determination of VOC emissions, on DNPH impregnated silicagel adsorption tubes for determination of volatile aldehydes, and on XAD-II sampling tubes for phthalates.

4.5 Air analysis

All measured concentrations in the test chamber air are transferred to air concentrations in the European Reference Room.

4.5.1 VOC, SVOC

The analytical determination is performed as specified in EN 16516. Identification and individual quantification shall be performed for all appearing VOCs and SVOCs – but only at an air concentration in the European Reference Room of minimum $5 \mu\text{g}/\text{m}^3$ (as far as technically feasible), resp. of minimum $1 \mu\text{g}/\text{m}^3$ (as far as technically feasible) for carcinogenic VOCs (C1A and C1B).

Substances with a limit value are calibrated with their authentic calibration.
Substances without a limit value are quantified in toluene equivalents.

4.5.2 CMR substances for French regulations

Benzene and trichloroethylene are determined in the same manner as the other VOCs, but determination of the phthalates DBP and DEHP requires a supplemental air sampling and analysis with adsorption on XAD-II tubes, extraction and GC/MS analysis to achieve a reasonable detection limit.

4.5.3 Aldehydes

The analysis is performed in line with EN 16516 / ISO 16000-3.

4.5.4 Sum and evaluation parameters

Calculation of TVOC, TSVOC, R value and "sum of all VOCs without German LCI" shall be performed as specified in EN 16516.

TVOC is calculated by addition of all individual results of 5 µg/m³ or above in the interval from n-hexane to n-hexadecane (n-C6 - n-C16) on a slightly polar GC column, but after calculation of all individual substances in toluene equivalents, as specified in the harmonized test method EN 16516.

TSVOC is calculated by addition of all individual results of 5 µg/m³ or above in the interval from n-hexadecane to n-docosane (> n-C16 - n-C22) on a slightly polar GC column, after calculation of all individual substances in toluene equivalents.

The individual concentrations of the substances with an LCI value shall be divided by the respective LCI value, and the sum of these quotients is the risk value R, which is different for the Belgian (R_B) or the German (R_D) list of LCI values, respectively:

$$R_B = \sum_i^n (c_i / LCI_i + \dots + c_n / LCI_n)$$

$$R_D = \sum_i^n (c_i / LCI_i + \dots + c_n / LCI_n)$$

5 Evaluation

5.1 Indoor Air Comfort

Indoor Air Comfort specification requires that air concentrations extrapolated for the European Reference Room do not exceed the following limit values:

Table 3: Limit values Indoor Air Comfort

INDOOR AIR COMFORT	After 3 days	After 28 days	Unit
TVOC (EN 16516)	10 000	1 000	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	100	µg/m ³
TSVOC	-	100	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A or A+	-
Formaldehyde	-	60	µg/m ³
Acetaldehyde	-	200	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

5.2 Indoor Air Comfort Gold

Indoor Air Comfort Gold specification requires that air concentrations extrapolated for the European Reference Room do not exceed the following limit values for all products, if not specified otherwise in the Annex:

Table 4: Limit values Indoor Air Comfort Gold

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	1 000	100	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	100	µg/m ³
TSVOC	-	50	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde	-	10	µg/m ³
Acetaldehyde	-	200	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

6 Certification contract

A contract is signed by manufacturer and certification body including scope and content of certification, and agreements on maintaining low VOC emissions from labelled products, e.g.

- Details and control of production process,
- Details and control of product composition and recipes,
- Raw materials checks and control,
- Factory production control,
- Internal laboratory tests,
- Traceability,
- Handling of customer complaints.

7 Inspection and surveillance

An approved inspector shall inspect the production processes on-site as far as relevant for the emission of volatile organic compounds from the finished product. The inspection shall cover all parameters influencing the emission behavior of the product, as specified in clause 6. This includes the availability of an archive of recipe changes to trace any changes that can be relevant for product emissions. If direct or indirect emission tests are part of factory production control, these test results shall be reviewed during the inspection as well.

During the inspection, samples of products for emissions testing shall be taken, in accordance with the product specific requirements for sampling.

An inspection report will be compiled containing all findings, recommendations and non-conformities.

The certification report combines the inspection report and the analytical test report of the tested sample. The certification report is an essential element of the certification of the product.

8 Certification

The certification is the final step in the application procedure for the labels Indoor Air Comfort and Indoor Air Comfort Gold.

This final step consists of an evaluation of the available documents such as the test report of the laboratory and the inspection report.

All emission test results are checked for plausibility. Based on all available facts the final decision on granting a certificate is made.

If the emission test results are not in compliance with the required specifications, then a laboratory test report will be issued, but a certificate cannot be granted.

Validity of a certificate is 5 years from the date of issue if the frequent re-inspection and re-testing does not show critical non-conformities.

9 Repetition of testing and inspections

To maintain certification, repetition of product emission testing and inspection of production facilities is required on an annual basis for both Indoor Air Comfort and Indoor Air Comfort Gold. In case of long time certified products and production sites, inspections and re-testing can be performed on a biannually basis. The scope of inspection and of retesting shall be the same as for the primary inspection, but the duration of the test can be reduced as described above.

If a product is no longer in compliance with the required specifications after the re-test, then this will be treated as a non-conformity. The Certification Body will define a period until this non-conformity needs to be solved including elimination of the emissive source and further re-testing.

10 Use of the label

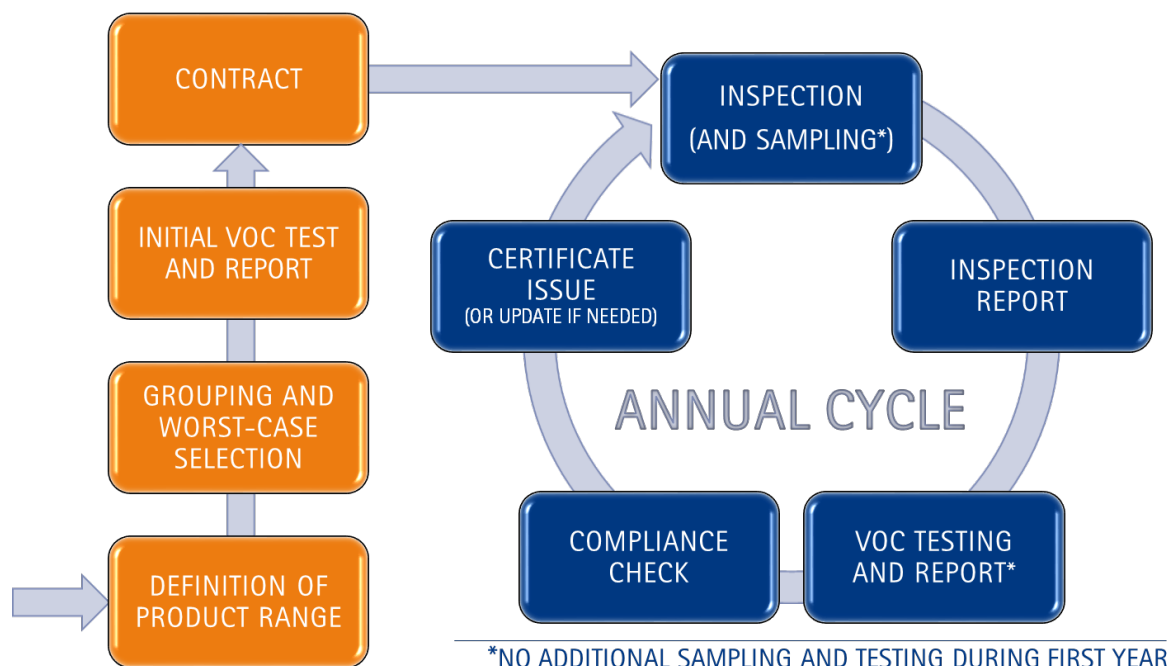
After successful first certification, Indoor Air Comfort and Indoor Air Comfort Gold labels can be used by the customer as discrete label.

The label can be used only on the products which are under the scope of certification or on respective marketing material.

Furthermore, the certification is accepted by many organizations and can be used for applying for other labels. A list of labels that accept test reports issued by Eurofins Product Testing A/S can be supplied upon request.

11 Summary of the procedure

- Definition of product range, grouping of products and selection of worst case product,
- Testing of worst case product in a ventilated test chamber according to EN 16516,
- Reporting and evaluation of test results,
- Contract between manufacturer and certification body, including agreements on actions for maintaining low VOC emissions from labelled products, e.g. on details of production, factory production control, quality documentation,
- Initial inspection of relevant manufacturing site(s),
- Inspection report including the relevant documentation,
- Certification process, including evaluation of test and inspection reports, granting or denying the certificate according to the criteria,
- Periodic external inspections by Eurofins incl. survey of emission relevant elements of quality documentation,
- Periodic re-testing for ensuring reliability of claims on low emissions,
- Continuous monitoring and improvement of specifications, testing and inspection methodology.



Annex I: Product specific requirements

A classification in compliance with Indoor Air Comfort GOLD requires that the emissions comply with the following limit values. Table 4 is valid for any products that are not listed in the following tables.

A.1 Textile floorings

Loading factor: 0.4 m²/m³

Back and edges are sealed airtight.

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	1000	100	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Limit values of the PRODIS/GUT system***	-	Below all limit values	-
Sum of VOC without German LCI and non-identified VOC	-	50 **	µg/m ³
TSVOC	-	30 **	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde, Acetaldehyde, each	-	4	µg/m ³
Octanal	-	5	µg/m ³
Other aldehydes, each****	-	8	µg/m ³
4-Vinylcyclohexene	-	2	µg/m ³
Styrene	-	2	µg/m ³
Naphthaline	-	3	µg/m ³
4-Phenylcyclohexene	-	5	µg/m ³
Tetrachloroethylene	-	10	µg/m ³
2-Ethylhexanoic acid	-	15	µg/m ³
Toluene	-	20	µg/m ³
1,4-Dichlorobenzene	-	40	µg/m ³
Vinylacetate	-	40	µg/m ³
Xylene	-	40	µg/m ³
NMP	-	40	µg/m ³
Ethylbenzene	-	40	µg/m ³
Phthalates: DBP, DEHP, DEP, BBP, DOP, DMP, each	-	1	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

** These limit must be kept already after 3 days for the EU ecolabel.

*** See <http://www.pro-dis.info/emission-test00.html?&L=0>

**** Special requirement of the Blue Angel DE-UZ 128.

A.2 Resilient floorings

Prohibited or restricted phthalates as specified in REACH shall not be used, resp. they shall not exceed the content restrictions as specified in REACH Annexes XIV and XVII).

Loading factor: 0.4 m²/m³

Back and edges are sealed airtight.

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	1 000	160	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	100	µg/m ³
TSVOC	-	30	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde	-	10	µg/m ³
Acetaldehyde	-	200	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

A.3 Wood-based floorings, skirting, panels and doors

Loading factor:	Floor or ceiling, table tops	0.4 m ² /m ³
	Walls / Pitched roof	1.0 m ² /m ³
	Doors, skirting	0.05 m ² /m ³

Back and edges are sealed airtight, and T-shaped joints are included for wooden floorings, as specified in DIBt laboratory manual.

Size of the test chamber (except doors and skirting): Minimum 225 liters.

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	250	160	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	50 **	µg/m ³
TSVOC	-	30	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde	-	10	µg/m ³
Acetaldehyde	-	200	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

** These limit must be kept already after 3 days for the EU ecolabel.

A.4 Thermal insulation

Loading factor:	Ceiling or floor	0.4 m ² /m ³
	Walls / Pitched roof	1.0 m ² /m ³
	Combination of ceiling and walls	1.0 m ² /m ³
	Tubes, channels, cables, tanks, each	0.4 m ² /m ³

Back and edges are sealed airtight.

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	1 000	100	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	50	µg/m ³
TSVOC	-	20	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde	-	10	µg/m ³
Acetaldehyde	-	200	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

A.5 Suspended (acoustic) ceilings

Loading factor: Ceiling 0.4 m²/m³

The sample shall be cut into a squared test specimen. Minimum one factory made edge shall be exposed to chamber air. The other edges should be sealed air tight. The sample shall be placed on one of the covered edges to allow emission from both front and back.

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	1 000	100	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	50	µg/m ³
TSVOC	-	20	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde	-	10	µg/m ³
Acetaldehyde	-	200	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

A.6 Gypsum boards

Loading factor: 1.0 m²/m³

Back and edges are sealed airtight.

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	1 000	60	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	40	µg/m ³
TSVOC	-	20	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde	50	10	µg/m ³
Acetaldehyde	50	50	µg/m ³
Sum of form- and acetaldehyde	50	-	ppb

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

A.7 Installation products

Scope:

Flooring adhesives, leveling compounds, primers, underlays.

Loading factor:	Floor	0.4 m ² /m ³
	Wall	1.0 m ² /m ³
	Floor and Wall	1.4 m ² /m ³

Application of the ready-to-use mixture on glass with a trowel, in a model, or test as a plate, details and amount as specified in EN 16516, ISO 16000-11 and GEV testing protocol. Higher application amounts as for DIBt testing (Ü-mark) also are accepted.

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	750	60	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	40	µg/m ³
TSVOC	-	30	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde	50	10	µg/m ³
Acetaldehyde	50	50	µg/m ³
Sum of formaldehyde and acetaldehyde	50	-	ppb
Other aldehydes (detectable with ISO 16000-3)	-	60	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

A.8 Sealants

Scope:
Joint sealants

Loading factor: 0.007 m²/m³

Apply the sample without bubbles into a profile made of stainless steel material with 3 mm depth and 10 mm width and flatten the surface. The length of the profile shall correspond to the required loading factor and the size of the test chamber.

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	750	20	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	40	µg/m ³
TSVOC	-	30	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde	50	10	µg/m ³
Acetaldehyde	50	50	µg/m ³
Sum of formaldehyde and acetaldehyde	50	-	ppb
Other aldehydes (detectable with ISO 16000-3)	-	60	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

A.9 Paints, varnishes, floor coatings for the interior

Additional requirements for a license for Indoor Air Comfort GOLD:

- Wall paints:
VOC content ready-to-use max. 10 g/l, SVOC content max. 30 g/l and 40 g/l in tinted paints (ISO 11890-2)
- Parquet coatings:
VOC content before application max. 5 %
- All coatings:
Conformity with the EU Decopaint Directive (2004/42/CE), and EU ecolabel requirements for VOC/SVOC, if applicable.

Loading factor:	Walls	1.0 m ² /m ³
	Ceiling or floor	0.4 m ² /m ³
	Wall and ceiling	1.4 m ² /m ³
	Small surfaces	0.05 m ² /m ³

Application of the ready-to-use mixture on glass with a trowel or brush, with the highest amount and number of layers specified in the technical data sheet, see EN 16402 (excluding preconditioning). Application on oak wood as for DIBt testing (Ü-mark) also is accepted. In case of multi-layer coatings, either the individual constituents or the whole system can be subject to certification, depending on the intended use and the related testing scenario.

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	1 000	100	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	50	µg/m ³
TSVOC	-	50	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde	50	10	µg/m ³
Acetaldehyde	50	50	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

A.10 Resin based liquid applied floorings

Resin based floorings are liquid applied floorings.

Loading factor: Floor: 0.4 m²/m³

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	1 000	100	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	100	µg/m ³
TSVOC	-	50	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
4 CMR substances as specified in the French regulations, each	-	1	µg/m ³
French VOC emission class	-	A+	-
Formaldehyde	-	10	µg/m ³
Acetaldehyde	-	200	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

A.11 Furniture

Scope:

Furniture based on wooden and other panels; upholstered furniture are not within the scope if this specification.

Loading factor:

A complete piece of furniture is tested and the results are recalculated to an area specific ventilation rate of 1.0 m³/(m²h). Testing of components of the furniture is possible, if representative components can be selected.

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	1 000	100	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	50	µg/m ³
TSVOC	-	50	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
Formaldehyde	-	10	µg/m ³
Acetaldehyde	-	200	µg/m ³

* As far as detectable with EN 16516 / ISO 16000-3/-6 test methods

A.12 Mattresses

Loading factor: mattress 1.0 m²/m³

INDOOR AIR COMFORT GOLD	After 3 days	After 28 days	Unit
TVOC (EN 16516)	500	200	µg/m ³
R _B value (based on Belgian LCI values)	-	1	-
R _D value (based on German LCI values)	-	1	-
Sum of VOC without German LCI and non-identified VOC	-	40	µg/m ³
TSVOC	-	40	µg/m ³
Sum of carcinogens (C1A, C1B) *	10	-	µg/m ³
Any individual carcinogens (C1A, C1B) *	-	1	µg/m ³
Formaldehyde	-	10	µg/m ³
Acetaldehyde	-	60	µg/m ³

A.13 Product systems

Scope:

- Floor or wall systems made of top covering, possibly underlay, installation products, and possibly subfloor,
- Raised access floors.

Loading factor: Walls 1.0 m²/m³
Ceiling or floor 0.4 m²/m³

Installation according to specifications of the manufacturer, including all intermediate drying periods. The test specimen can be prepared by the manufacturer, as long as at least the top layer is installed in the testing lab immediately before starting the test.

Criteria and limit values:

The specifications for the used top layer apply to the whole system. If the top layer is e.g. a coated floor covering, then the specifications of the floor covering apply and not of the coating.

Annex II: Schemes and regulations covered by Indoor Air Comfort Gold

Indoor Air Comfort Gold is combining limit values from various schemes and requirements. The current versions of the respective requirements at the time of publishing the Indoor Air Comfort Gold specification were used. Following limit values for VOC emissions are considered in the product specific categories mentioned in Annex I:

Label or regulation	A1: Textile floorings	A2: Resilient floorings	A3: Wood based floorings, skirting, panels and doors	A4: Insulation material	A5: Suspended ceilings	A6: Gypsum boards	A7: Installation products	A8: Sealants	A9: Paints, varnishes, floor coatings	A10: Resin based liquid applied floorings	A11: Furniture	A12: Mattresses
Belgian regulation	X	X	X				X			X		
France VOC class A+	X	X	X	X	X	X	X	X	X	X		
Germany (AgBB/ABG)	X	X	X	X	X	X	X	X	X	X		
BREEAM international	X	X	X	X	X	X	X	X	X	X		
BREEAM NOR	X	X	X	X	X	X	X	X	X	X		
BREEAM NL	X	X	X	X	X	X	X	X	X	X		

Label or regulation	A1: Textile floorings	A2: Resilient floorings	A3: Wood based floorings, skirting, panels and doors	A4: Insulation material	A5: Suspended ceilings	A6: Gypsum boards	A7: Installation products	A8: Sealants	A9: Paints, varnishes, floor coatings	A10: Resin based liquid applied floorings	A11: Furniture	A12: Mattresses
LEED	X	X	X	X	X	X	X	X	X	X		
WELL Building	X	X	X	X	X	X	X	X	X	X		
SKA Rating	X	X	X	X	X	X	X	X	X	X		
French HQE certification	X	X	X	X	X	X	X	X	X	X		
Italian CAM Edilizia	X	X	X	X	X	X	X	X	X	X		
BVB (Sweden)	X	X	X	X	X	X	X	X	X	X		
Eco Product Norway	X	X	X	X	X	X	X	X	X	X		
DGNB	X	X	X	X	X	X	X	X	X	X		
EMICODE EC1Plus						X	X	X				
GUT	X											
EU ecolabel			X						X			X
Nordic Swan	X	X	X		X	X	X		X			

Label or regulation	A1: Textile floorings	A2: Resilient floorings	A3: Wood based floorings, skirting, panels and doors	A4: Insulation material	A5: Suspended ceilings	A6: Gypsum boards	A7: Installation products	A8: Sealants	A9: Paints, varnishes, floor coatings	A10: Resin based liquid applied floorings	A11: Furniture	A12: Mattresses
Blue Angel; DE-UZ	128	120	176 except doors	132	132		113	123			38	119
Austrian Ecolabel, UZ	35	42	07									
M1	X	X	X	X	X	X	X	X	X	X	X	
Danish Indoor Climate Label	X	X	X	X	X	X	X	X	X	X	X	
FEMB											X	
Singapore Green Label	X	X	X	X	X	X	X	X	X	X		
GreenTag Australia	X	X	X	X	X	X	X	X	X	X		

Annex III: Abbreviations

BBP	Butyl benzyl phthalate
CMR	Carcinogenic, Mutagenic or Toxic for Reproduction
DBP	Dibutyl Phtalate
DEHP	Di(2-ethylhexyl) phthalate
DEP	Diethyl phthalate
DIBt	Deutsches Institut für Bautechnik
DMP	Dimethyl phthalate
DNPH	2,4-Dinitrophenylhydrazine
EN	European Norm (European Standard)
EU	European Union
GC	Gas Chromatography
GC/MS	Gas Chromatography – Mass Spectrometry
GUT	Association of Environmentally Friendly Carpets e.V. (Gemeinschaft umweltfreundlicher Teppichboden)
IAC	Indoor Air Comfort
IACG	Indoor Air Comfort Gold
ISO	International Organization for Standardization
LCI	Lowest Contentration of Interest
NMP	1-methyl-2-pyrrolidone
PRODIS	PRODuct Information System of the European Carpet Industry
R value	Risk Value
REACH	Regulation of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals
RH	Relative Humidity
SVHC	Substances of Very High Concern
SVOC	Semi Volatile Organic Compounds
TSVOC	Total Semi Volatile Organic Compounds
TVOC	Total Volatile Organic Compounds
VOC	Volatile Organic Compounds
XAD-II	Hydrophobic crosslinked polystyrene copolymer resin, a polymeric adsorbent

Annex IV: Revision table

The table below lists the substantial content changes in comparison to the previous version of the specifications. Editorial changes are not specifically listed.

Part	Revision
Various	Updated standard version from CEN/TS 16516 to EN 16516
Introduction	Updated core values of the Indoor Air Comfort Gold certification
1.0	Updated scope including new product groups as mentioned below
4.4	Removed note on wood based products and passage on re-testing according to 3-day-reference value
4.5.3	Removed reference to EN 717-1
9	Specified the non-conformities treatment procedure
11	More detailed procedure and added procedure explanation graphics
13	Removed the list of literature
Annex I, A3	Added “skirting” to the category “Wood-based floorings, skirting, panels and doors”
Annex I, A4	Change of limit value: Sum of VOC without German LCI and non-identified VOC
Annex I, A5	Added the product category “Suspended (acoustic) ceilings”
Annex I, A6	Limiting loading factor for gypsum boards to 1.0 m ² /m ³
Annex I, A8	Moved “Sealants” from the category “Installation products” to a separate category “Sealants” and adjusted limit values
Annex I, A9	Added further loading scenario
Annex I, A10	Revised test conditions for furniture
-	Added Annexes II-IV