

Specifications

Indoor Air Comfort[®] and Indoor Air Comfort Gold[®]

Version 2.0

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Foreword

This document contains the specifications for certification and labelling of building materials 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 for ensuring continuous low VOC emissions from a product is a combination of product testing, factory production control, and third party auditing of the emission relevant processes and parameters during production.

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

The IAC certification approach by Eurofins is a combination of:

- Simplifying life by covering all relevant emissions specifications in use in Europe if certification criteria are fulfilled;
- Allowing use of a low emission label where no such label existed before;
- Increasing public trust by higher control intensity (third-party auditing and re-testing);
- Third-party auditing in combination with factory production control as management tool for manufacturers for monitoring and - if relevant - for reducing VOC emissions from certified products.

The approach of the label is to create a harmonized umbrella standard for various materials, combining mandatory and voluntary requirements. The same methodology and analytical techniques, as specified in international standards, is used in testing procedures for all involved products; this approach is a new step towards harmonization in contrast to earlier, industry specific testing methodologies.

Hamburg / Galten, January 2010

Dr. Roland Augustin
Director Certification Chemical Safety

Table of content

| | |
|--|----|
| Foreword | 2 |
| Table of content..... | 3 |
| 1 Scope and application..... | 4 |
| 2 Specifications..... | 4 |
| 3 Use properties / Declaration | 4 |
| 4 Emission Testing..... | 4 |
| 5 Evaluation | 6 |
| 5.1 Indoor Air Comfort..... | 6 |
| 5.2 Indoor Air Comfort Gold | 7 |
| 6 Certification contract | 9 |
| 7 Inspection (Third Party Auditing)..... | 9 |
| 8 Certification Process | 9 |
| 9 Repetition of tests and renewal of certificate | 10 |
| 10 Use of label | 10 |
| 11 Summary of procedure | 11 |
| 12 Literature..... | 11 |
| Annex 1: Taking samples, and test specimen preparation | 13 |
| 1.1 Taking samples..... | 13 |
| 1.2 Test specimen preparation | 13 |
| Annex 2: Analytical procedure | 13 |
| 2.1 VOC, SVOC | 13 |
| 2.1 CMR substances in French regulation..... | 13 |
| 2.3 Aldehydes | 13 |
| Annex 3: Indoor Air Comfort Gold: Product specific criteria..... | 14 |
| 3.1 Textile floor coverings..... | 14 |
| 3.2 Resilient floor coverings..... | 15 |
| 3.3 Wooden floor coverings | 16 |
| 3.4 Insulation material..... | 17 |
| 3.5 Gypsum boards..... | 18 |
| 3.6 Flooring installation products such as adhesives..... | 19 |
| 3.7 Furniture..... | 20 |

1 Scope and application

This document contains specifications for building materials and furniture with respect to certification and labelling with Indoor Air Comfort or Indoor Air Comfort Gold. The following materials are covered:

- Textile floor coverings (according to EN 14041);
- Resilient floor coverings (according to EN 14041);
- Wooden floorings;
- Insulation materials (EN 13162 until EN 13171);
- Gypsum boards (EN 520);
- Adhesives, levelling compounds and primers;
- Other building materials;
- Furniture.

2 Specifications

Indoor Air Comfort labelling and classification of a product is based on the results of emission testing. The emission test is performed after 3 and 28 days and follows the principles of the ISO 16000 standards or comparable international standards. A certificate is only granted on the basis of the emission testing and auditing program.

Any Indoor Air Comfort labelled product shall meet legal restrictions within the EU. Additional requirements such as fitness for use, material composition or fulfilling of special requirements regarding limit values, or ban of certain substances, are not part of this program, but can be evaluated upon special request.

3 Use properties / Declaration

Building materials 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 CE mark if available. Furthermore, information on correct installation or a technical data sheet shall be available.

4 Emission Testing

Determination of emissions behaviour shall be performed only on freshly produced material. The tested product shall be ready for use and prepared for delivery. Sampling shall occur not later than eight weeks after last step of production - this may include essential storage periods. Sample taking of product for testing shall be performed according to ISO 16000-11 or equivalent international or national standards. Samples taken shall be packed airtight and be protected against contamination. A detailed documentation including sampling protocol and product description shall follow the sample into the laboratory along with an order form and a

chain of custody protocol (as a documentation of sample history from sample taking until start of test).

Test specimen preparation prior to testing shall be performed as specified for the respective product. Emission testing shall be performed in a test chamber made of stainless steel as specified in ISO 16000-9 at 23 (± 1) °C and 50 (± 5) % rH. 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. Test specimen shall remain stored in the test chamber during the whole testing period and shall be removed only after final air sampling from test chamber.

In line with European standardization and European reference room for emission testing, the following loading factors shall be applied:

Table 1: European reference room

| | 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

| Intended use | Loading factor |
|-----------------------------|------------------------------------|
| Ceiling and flooring | 0.4 m ² /m ³ |
| Walls | 1.0 m ² /m ³ |
| Ceiling, walls and flooring | 1.4 m ² /m ³ |

Allowed deviation from these values in test chamber is $\pm 50\%$ of the specified value, but max. 2.0 m²/m³. In case of deviations, the test result shall be re-calculated to the specified value.

Emission behaviour is measured with appropriate adsorbing materials and analytical procedures for the testing parameters as specified in ISO 16000-3 and -6. The limits of detection and for quantification shall be applied as specified in the involved testing procedures.

VOC emission testing shall be performed after 3 and 28 days in test chamber using Tenax TA tubes for adsorption of VOC from test chamber air; additionally volatile aldehydes will be tested after 28 days in test chamber using DNPH-cartridges. In case of unknown emission behaviour, a complete test is mandatory. If the limit values are respected at an earlier stage (e.g. already after 3 days), the test results at this point of time shall be considered as reference value for retesting. If re-testing shows that emission behaviour of the product is significantly different from initial test results or higher emissions are observed at the early testing time, e.g. due to a change in recipe or manufacturing process, the emission test shall be performed during the whole testing period of 28 days.

For evaluation of the test results all relevant documents such as list of German NIK values or of French CLI values or any other relevant documents are used.

5 Evaluation

Assignment of the labels Indoor Air Comfort and Indoor Air Comfort Gold requires respect of following specifications.

5.1 Indoor Air Comfort

Identification and individual quantification shall be performed for as many single VOC as possible - at least for those VOC that are on the German list of substances with NIK values (NIK = Lowest Concentration of Interest) - but only if an air concentration of $5 \mu\text{g}/\text{m}^3$ is exceeded in the test chamber. All other compounds giving air concentrations above $1 \mu\text{g}/\text{m}^3$ shall be quantified as toluene equivalents. Calculation of total VOC (TVOC) shall be performed both by addition of all individual results above $5 \mu\text{g}/\text{m}^3$ in the interval C6-C16 on a non-polar GC column and by calculating all individual substances as toluene equivalents. In case of differences between these both TVOC values, the higher value shall be used as final TVOC value. But both values shall be reported.

All air concentrations are calculated for the European reference room from test results in test chamber.

The individual concentrations shall be divided by the respective NIK value, and the sum of these quotients is the R_D value:

$$R_D = \sum_i^n \left(\frac{c_i}{\text{NIK}_i} + \dots + \frac{c_n}{\text{NIK}_n} \right)$$

Table 3: Limit values Indoor Air Comfort

The following limit values (air concentration in European reference room) shall always be respected for Indoor Air Comfort certification:

| INDOOR AIR COMFORT | After 3 days | After 28 days | Unit |
|---|--------------|-------------------|-------------------|
| TVOC | 10 000 | 1000 | µg/m ³ |
| R _D value (based on German NIK values) | - | 1 | - |
| Sum of VOC without NIK and non identified VOC | - | 100 | µg/m ³ |
| TSVOC | - | 100 | µg/m ³ |
| Sum of carcinogens (C1, C2)* | 10 | - | µg/m ³ |
| Any individual carcinogens (C1, C2)* | - | 1 | µg/m ³ |
| 4 CMR substances as specified in French regulations, each | - | 1 | µg/m ³ |
| French VOC emission class - TVOC | - | class A+ | - |
| French VOC emission class - VOCs | - | class B or better | - |
| Formaldehyde | - | 120 | µg/m ³ |

* If detectable with ISO 16000-3/-6 test methods

5.2 Indoor Air Comfort Gold

Identification and individual quantification shall be performed for as many single VOC as possible - at least for those VOC that are on either German or French list of substances with LCI values (LCI = Lowest Concentration of Interest) - but only if an air concentration of 5 µg/m³ is exceeded in the test chamber. All other compounds giving air concentrations above 1 µg/m³ shall be quantified as toluene equivalents. Calculation of total VOC (TVOC) shall be performed both by addition of all individual results above 5 µg/m³ in the interval C6-C16 on a non-polar GC column and by calculating all individual substances as toluene equivalents. In case of differences between these both TVOC values, the higher value shall be used as final TVOC value. But both values shall be reported.

All air concentrations are calculated for the European reference room from test results in test chamber.

The individual concentrations shall be divided by the respective NIK value, and the sum of these quotients is the R_D value.

$$R_D = \sum_i^n \left(\frac{c_i}{\text{NIK}_i} + \dots + \frac{c_n}{\text{NIK}_n} \right)$$

The individual concentrations shall be divided by the respective CLI value, and the sum of these quotients is the R_F value:

$$R_F = \sum_i^n \left(\frac{c_i}{CLI_i} + \dots + \frac{c_n}{CLI_n} \right)$$

Table 4: Limit values Indoor Air Comfort Gold

The following limit values (air concentration in European reference room) shall be respected for Indoor Air Comfort Gold certification for all products if not specified differently in the Annex:

| INDOOR AIR COMFORT GOLD | After 3 days | After 28 days | Unit |
|---|--------------|-------------------|----------------------------------|
| TVOC | 1000 | 100 | $\mu\text{g}/\text{m}^3$ |
| R_D value (based on German NIK values) | - | 1 | - |
| R_F value (based on French CLI values) | - | 1 | - |
| Sum of VOC without NIK and non identified VOC | - | 50 | $\mu\text{g}/\text{m}^3$ |
| Sum of VOC without CLI and non identified VOC | - | 50 | $\mu\text{g}/\text{m}^3$ |
| TSVOC | - | 50 | $\mu\text{g}/\text{m}^3$ |
| Sum of carcinogens (C1, C2)* | 10 | - | $\mu\text{g}/\text{m}^3$ |
| Any individual carcinogen (C1, C2)* | - | 1 | $\mu\text{g}/\text{m}^3$ |
| 4 CMR substances as specified in French regulations, each | - | 1 | $\mu\text{g}/\text{m}^3$ |
| French VOC emission class - TVOC | - | class A+ | - |
| French VOC emission class - VOCs | - | class A or better | - |
| Formaldehyde | - | 10 | $\mu\text{g}/\text{m}^3$ |
| Optional additional tests | | | |
| Ammonia ¹ | - | 30 | $\mu\text{g}/\text{m}^2\text{h}$ |
| Odour Test M_1 ¹ | - | $\geq + 0.1$ | |

* If detectable with ISO 16000-3/-6 test methods

¹ = Only if used for the Finnish M1 classification

6 Certification contract

- A contract is signed by manufacturer and certification body including scope and contents of certification, and agreements on maintaining low VOC emissions from labelled products, e.g.
- details of production,
- exclusion of certain raw materials,
- factory production control,
- quality documentation.

7 Inspection (Third Party Auditing)

An independent auditor shall inspect production process on-site as far as relevant for the emission of volatile organic compounds from the product. The audit shall cover all parameters influencing the emission behaviour of the product such as raw materials, production and drying processes and all other emission relevant elements of production process, as well as factory production control and related documentation. If emission tests are part of factory production control, these tests shall be audited during inspection. Taking of samples of products for emission testing shall be another part of the audit and shall be performed in accordance with the product specific requirements for sampling.

Any findings during audit shall be compiled in a report, summarizing all results, remarks, recommendations and deviations. The audit report will be an essential element of certification of the product.

8 Certification Process

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

This final step consists of an evaluation process of the available reports and results and further documentation like chain of custody, the laboratory tests and the on-site inspection. A certification committee will perform this evaluation process. This committee will be by consisting of minimum two persons - the head of certification body and the head of testing body or their substitutes in case of temporary absence. Other experts may be involved if necessary. All emission test results are checked for plausibility and a final calculation of emission factors may be performed. Based on all available facts the final decision on granting of a certificate is taken. The evaluation basis shall be compiled in an evaluation sheet that shall be available to customer upon request.

If a lab report shows deviations from above specifications then laboratory test reports may be issued but certificate must not be granted.

Results of tests performed in another laboratory than Eurofins Product Testing A/S in Galten can be accepted as part of evaluation process if:

- Test on which report was written is not older than six months;
- Specifications of Indoor Air Comfort label or of Indoor Air Comfort Gold label are respected, and no testing parameter is above 70% of its limit value;
- Age of sample when starting the test, sampling, packaging and transport comply with the specifications in this document;
- Laboratory is ISO/IEC 17025 accredited, and VOC emission testing is covered completely by scope of that accreditation;
- Laboratory participated in at least one emission test chamber round robin tests within the last two years, and there was no larger deviation from median value than $\pm 30\%$ - or the laboratory can show successful participation in proficiency tests for VOC emission testing with certified VOC emission standards.

Validity of a certificate is 2 years from date of issue for Indoor Air Comfort and 1 year for Indoor Air Comfort Gold.

9 Repetition of tests and renewal of certificate

Renewal of certification requires repetition of product emission testing and audit of production facilities, in case of Indoor Air Comfort Gold label on an annual basis, and in case of Indoor Air Comfort label every two years. Scope of audit and of retesting shall be as for primary audit, but duration of test can be reduced if a reference value at earlier point of time is available from most recent testing. Use of appropriate short-term tests and simplified tests is possible upon decision by the head of certification body.

10 Use of label

Indoor Air Comfort and Indoor Air Comfort Gold labels can be used by customer as discrete label - especially in areas and for products for which no other label is available. Furthermore, the test reports are accepted by many organizations and can be used for applying for other - mostly national - labels. A list of labels that accept test reports issued by Eurofins Product Testing A/S can be supplied upon request, or can be found in the Internet at www.product-testing.eurofins.com.

11 Summary of procedure

- Test of sample in test chamber (Testing schedule may differ by product group);
- Reporting of test results (Specifications may differ by product group);
- Contract between manufacturer and certification body, including agreements on actions for maintaining low VOC emissions from labelled products, e.g. on details of production, exclusion of certain raw materials, factory production control, quality documentation;
- Initial audit of relevant manufacturing site(s); Audit report including the relevant documentation;
- Certification process, including evaluation of test and audit reports, granting or denying of certificate according to the criteria;
- Periodic external audits 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 auditing methodology.

12 Literature

- AgBB: Health-related Evaluation Procedure for Volatile Organic Compounds Emissions (VOC and SVOC) from Building Products (2008):
www.umweltbundesamt.de/building-products/agbb.htm
- French regulations:
- Arrêté du 30 avril 2009 relatif aux conditions de mise sur le marché des produits de construction et de décoration contenant des substances cancérigènes, mutagènes ou reprotoxiques de catégorie 1 ou 2. JORF n°0122 du 28 mai 2009 page 8840 texte n° 2.
- Arrêté du 28 mai 2009 modifiant l'arrêté du 30 avril 2009 relatif aux conditions de mise sur le marché des produits de construction et de décoration contenant des substances cancérigènes, mutagènes ou reprotoxiques de catégorie 1 ou 2 JORF n°0124 du 30 mai 2009 page 8940 texte n° 12
- French compulsory VOC emissions labelling:
- PROJET de DECRET relatif à l'étiquetage des produits de construction et de décoration sur leurs émissions en substances volatiles polluantes.
- PROJET d'ARRÊTÉ

- relatif à l'étiquetage des produits de construction et de décoration sur leurs émissions en substances volatiles polluantes
- EU list of carcinogens (in German, but readable in English):
www.dguv.de/bgia/de/fac/kmr/kmr_neue_bezeichnungen.pdf
- AFSSET, Risques sanitaires liés aux composés organiques volatils dans l'air intérieur (2009):
www.afsset.fr/index.php?pageid=714&parentid=424
- Blue Angel specifications:
www.blauer-engel.de/en/products_brands/search_products/search_for_products.php
- ISO 16000 - Indoor Air
- ISO 16000-3: Determination of formaldehyde and other carbonyl compounds — Active sampling method (2001)
- ISO 16000-6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS/FID (2004)
- ISO 16000-9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method (2006)
- ISO 16000-11: Determination of the emission of volatile organic compounds from building products and furnishing - Sampling, storage of samples and preparation of test specimens (2006)
- CEN TC 351 WG 2 N0124: CEN/TC 351/WG 2 "Emissions into indoor air" - WI 351009 - Construction products - Assessment of emissions of regulated dangerous substances from construction products - Determination of emissions into indoor air (internal draft as of 24 March 2009).
- M1: Emission classification of building materials:
www.rts.fi/emission_classification_of_building_materials.htm
- ECA 24 Report No 24: Harmonisation of indoor material emissions labelling systems in the EU - Inventory of existing schemes:
www.inive.org/medias/ECA/ECA_Report24.pdf
- Healthy Buildings Conference 2009, Workshop on harmonization of VOC emission rating schemes:
<http://product-testing.eurofins.com/testing/safety---chemical-electrical-fire/chemical-safety/emission-into-indoor-air/emission-testing---events/healthy-buildings-conference-2009/presentations-in-voc-workshop.aspx>

Annex 1: Taking samples, and test specimen preparation

1.1 Taking samples

A representative sample shall be selected from production line or from stock.

A sample taken shall be wrapped airtight according to specifications of testing laboratory. Large samples (e.g. furniture, insulation material) shall be kept as airtight as possible during transport and storage.

Any sample shall be dispatched to the testing laboratory within 24 hours after sampling.

Age of sample when arriving at testing laboratory shall not exceed 7 weeks (general rule). Exception: Age of unopened canned products if remaining in their original can shall not exceed the date of minimum durability when tested.

Specifications in national and international standards (ISO 16000-11, M1, DIBt procedures, and product specific EN standards) shall be followed as far as appropriate.

1.2 Test specimen preparation

Specifications in national and international standards (ISO 16000-11, M1, DIBt procedures, GEV testing protocol, and product specific EN standards) shall be followed as far as appropriate.

Furniture shall be tested as whole unit. A representative piece may be cut from very large furniture units. Cut edges shall be sealed airtight for testing. Test result shall be recalculated to whole unit of furniture.

Annex 2: Analytical procedure

2.1 VOC, SVOC

Analytical procedure shall follow ISO 16000-6 with the additional specifications in European standardisation (CEN TC 351 WG2 document N0124 and later versions).

2.1 CMR substances in French regulation

Same as for VOC, but the phthalates DBP and DEHP requires and additional air sampling and analysis with adsorption on XAD-II tubes, desorption and GC/MS analysis for achieving a reasonable detection limit.

2.3 Aldehydes

Analytical procedure shall follow ISO 16000-3.

Annex 3: Indoor Air Comfort Gold: Product specific criteria

All air concentrations in below tables mean the air concentration calculated for the European reference room from test results obtained in test chamber, see clause 5.2.

3.1 Textile floor coverings

Loading factor: 0.4 m²/m³. Back and edges sealed

| INDOOR AIR COMFORT GOLD | After 3 days | After 28 days | Unit |
|---|--------------|-------------------|---------------------|
| TVOC | 250 | 100 | µg/m ³ |
| R _D value (based on German NIK values) | - | 1 | - |
| R _F value (based on French CLI values) | - | 1 | - |
| Sum of VOC without NIK and non identified VOC | - | 50 ² | µg/m ³ |
| Sum of VOC without CLI and non identified VOC | - | 50 | µg/m ³ |
| TSVOC | - | 30 ² | µg/m ³ |
| Any individual carcinogen (C1, C2)* | 1 | 1 | µg/m ³ |
| 4 CMR substances as specified in French regulations, each | - | 1 | µg/m ³ |
| French VOC emission class - TVOC | - | class A+ | - |
| French VOC emission class - VOCs | - | class A or better | - |
| Formaldehyde | - | 10 | µg/m ³ |
| Other aldehydes, each** | - | 20 | ppb |
| 4-Phenylcyclohexen | - | 5 | µg/m ³ |
| Odour Test _{GUT} | 3 | - | |
| Optional additional tests | | | |
| Ammonia ¹ | - | 30 | µg/m ² h |
| Odour Test _{M1} ¹ | - | ≥ + 0.1 | |

* If detectable with ISO 16000-3/-6 test methods

** Special requirement of Blue Angel

¹ = Only if used for the Finnish M1 classification

² = If EU ecolabel shall be applied for then these values have to be complied with already after 3 days

These limit values are covering:

AgBB, AFSSET, M1, GUT/PRODIS, Blue Angel RAL UZ 128, EU ecolabel

3.2 Resilient floor coverings

Loading factor: 0.4 m²/m³

Back and edges sealed

| INDOOR AIR COMFORT GOLD | After 3 days | After 28 days | Unit |
|---|--------------|-------------------|---------------------|
| TVOC | 1200 | 160 | µg/m ³ |
| R _D value (based on German NIK values) | - | 1 | - |
| R _F value (based on French CLI values) | - | 1 | - |
| Sum of VOC without NIK and non identified VOC | - | 100 | µg/m ³ |
| Sum of VOC without CLI and non identified VOC | - | 100 | µg/m ³ |
| TSVOC | - | 40 | µg/m ³ |
| Sum of carcinogens (C1, C2)* | 10 | - | µg/m ³ |
| Any individual carcinogen (C1, C2)* | - | 1 | µg/m ³ |
| 4 CMR substances as specified in French regulations, each | - | 1 | µg/m ³ |
| French VOC emission class - TVOC | - | class A+ | - |
| French VOC emission class - VOCs | - | class A or better | - |
| Formaldehyde | - | 10 | µg/m ³ |
| Optional additional tests | | | |
| Ammonia ¹ | - | 30 | µg/m ² h |
| Odour Test M ₁ ¹ | - | ≥ + 0.1 | |

* If detectable with ISO 16000-3/-6 test methods

¹ = Only if used for the Finnish M1 classification

These limit values are covering:

AgBB, AFSSET, M1, Blue Angel RAL UZ 120, Austrian UZ 56

3.3 Wooden floor coverings

Loading factor: 0.4 m²/m³

Back and edges sealed

| INDOOR AIR COMFORT GOLD | After 3 days | After 28 days | Unit |
|---|--------------|-------------------|---------------------|
| TVOC | 250 | 160 | µg/m ³ |
| R _D value (based on German NIK values) | - | 1 | - |
| R _F value (based on French CLI values) | - | 1 | - |
| Sum of VOC without NIK and non identified VOC | - | 50 ² | µg/m ³ |
| Sum of VOC without CLI and non identified VOC | - | 50 | µg/m ³ |
| TSVOC | - | 30 ² | µg/m ³ |
| Any individual carcinogen (C1, C2)* | 1 | 1 | µg/m ³ |
| 4 CMR substances as specified in French regulations, each | - | 1 | µg/m ³ |
| French VOC emission class - TVOC | - | class A+ | - |
| French VOC emission class - VOCs | - | class A or better | - |
| Formaldehyde | - | 10 | µg/m ³ |
| Optional additional tests | | | |
| Ammonia ¹ | | 30 | µg/m ² h |
| Odour Test _{M1} ¹ | | ≥ + 0.1 | |

* If detectable with ISO 16000-3/-6 test methods

¹ = Only if used for the Finnish M1 classification

² = If EU ecolabel shall be applied for then these values have to be complied with already after 3 days

These limit values are covering:

AgBB, AFSSET, M1, Blue Angel RAL UZ 38, Austrian UZ 56, EU ecolabel

3.4 Insulation material

| | | |
|-----------------|-------------------|------------------------------------|
| Loading factor: | Walls | 1.0 m ² /m ³ |
| | Ceiling, flooring | 0.4 m ² /m ³ |
| | Ceiling and wall | 1.4 m ² /m ³ |

| INDOOR AIR COMFORT GOLD | After 3 days | After 28 days | Unit |
|---|--------------|-------------------|---------------------|
| TVOC | 1000 | 100 | µg/m ³ |
| R _D value (based on German NIK values) | - | 1 | - |
| R _F value (based on French CLI values) | - | 1 | - |
| Sum of VOC without NIK and non identified VOC | - | 50 | µg/m ³ |
| Sum of VOC without CLI and non identified VOC | - | 50 | µg/m ³ |
| TSVOC | - | 20 | µg/m ³ |
| Sum of carcinogens (C1, C2)* | 10 | - | µg/m ³ |
| Any individual carcinogen (C1, C2)* | - | 1 | µg/m ³ |
| 4 CMR substances as specified in French regulations, each | - | 1 | µg/m ³ |
| French VOC emission class - TVOC | - | class A+ | - |
| French VOC emission class - VOCs | - | class A or better | - |
| Formaldehyde | - | 10 | µg/m ³ |
| Optional additional tests | | | |
| Ammonia ¹ | - | 30 | µg/m ² h |
| Odour Test M ₁ ¹ | - | ≥ + 0.1 | |

* If detectable with ISO 16000-3/-6 test methods

¹ = Only if used for the Finnish M1 classification

These limit values are covering:

AFSSET, M1, Blue Angel RAL UZ 132

3.5 Gypsum boards

| | | |
|-----------------|----------------------------|------------------------------------|
| Loading factor: | Walls | 1.0 m ² /m ³ |
| | Ceiling, flooring | 0.4 m ² /m ³ |
| | Ceiling, wall and flooring | 1.4 m ² /m ³ |

| INDOOR AIR COMFORT GOLD | After 3 days | After 28 days | Unit |
|---|--------------|-------------------|---------------------|
| TVOC | 1000 | 100 | µg/m ³ |
| R _D value (based on German NIK values) | - | 1 | - |
| R _F value (based on French CLI values) | - | 1 | - |
| Sum of VOC without NIK and non identified VOC | - | 50 | µg/m ³ |
| Sum of VOC without CLI and non identified VOC | - | 50 | µg/m ³ |
| TSVOC | - | 20 | µg/m ³ |
| Sum of carcinogens (C1, C2)* | 10 | - | µg/m ³ |
| Any individual carcinogen (C1, C2)* | - | 1 | µg/m ³ |
| 4 CMR substances as specified in French regulations, each | - | 1 | µg/m ³ |
| French VOC emission class - TVOC | - | class A+ | - |
| French VOC emission class - VOCs | - | class A or better | - |
| Formaldehyde | - | 10 | µg/m ³ |
| Optional additional tests | | | |
| Ammonia ¹ | - | 30 | µg/m ² h |
| Odour Test _{M1} ¹ | - | ≥ + 0.1 | |

* If detectable with ISO 16000-3/-6 test methods

¹ = Only if used for the Finnish M1 classification

These limit values are covering:

AFSSET, M1, Blue Angel RAL UZ 132 (acoustical ceilings)

3.6 Flooring installation products such as adhesives

Loading factor: 0.4 m²/m³

Application: 300 g/m² with B1 notched trowel

Flooring installation products cannot be labelled IAC or IAC Gold as there is an agreement with GEV that EMICODE EC1 labelled products are regarded as of equivalent quality as Indoor Air Comfort Gold specifications.

3.7 Furniture

Loading factor:

One unit of furniture is tested, e.g. 1 chair. The unit specific emission rate is calculated ($\mu\text{g} / \text{h}$ per piece of furniture).

Within certification process, a realistic definition is set up of how many pieces of furniture can be expected to be placed in the European reference room (12 m² floor area). If more than 1 piece will be placed there, then the resulting unit specific emission rate is multiplied with the number of furniture units.

The resulting total unit specific emission rate is used for calculating air concentrations in the European reference room.

| INDOOR AIR COMFORT GOLD | After 3 days | After 28 days | Unit |
|---|--------------|-------------------|--------------------------|
| TVOC | 1000 | 300 | $\mu\text{g}/\text{m}^3$ |
| R _D value (based on German NIK values) | - | 1 | - |
| R _F value (based on French CLI values) | - | 1 | - |
| Sum of VOC without NIK and non identified VOC | - | 40 | $\mu\text{g}/\text{m}^3$ |
| Sum of VOC without CLI and non identified VOC | - | 40 | $\mu\text{g}/\text{m}^3$ |
| TSVOC | - | 50 | $\mu\text{g}/\text{m}^3$ |
| Sum of carcinogens (C1, C2)* | 10 | - | $\mu\text{g}/\text{m}^3$ |
| Any individual carcinogen (C1, C2)* | - | 1 | $\mu\text{g}/\text{m}^3$ |
| 4 CMR substances as specified in French regulations, each | - | 1 | $\mu\text{g}/\text{m}^3$ |
| French VOC emission class - TVOC | - | class A+ | - |
| French VOC emission class - VOCs | - | class A or better | - |
| Formaldehyde | - | 40 | $\mu\text{g}/\text{m}^3$ |
| Sum of other aldehydes | - | 40 | $\mu\text{g}/\text{m}^3$ |

* If detectable with ISO 16000-3/-6 test methods

These limit values are covering:

Blue Angel RAL UZ 117, and German and French limit values (NIK, CLI), with the exception of French CLI for formaldehyde.