BLUE ANGEL

The German Ecolabel

Low-Emission Furniture and Slatted Frames made of Wood and Wood-Based Materials

DE-UZ 38

Basic Award Criteria

Edition January 2022

Version 6

The Environmental Label is supported by the following four institutions:

Federal Ministry
for the Environment, Nature Conservation,
Nuclear Safety and Consumer Protection

The Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection is the owner of the label. It regularly provides information on the decisions taken by the Environmental Label Jury.

Umwelt Bundesamt

The German Environmental Agency with its specialist department for "Ecodesign, Eco-Labelling and Environmentally friendly Procurement" acts as office of the Environmental Label Jury and develops the technical criteria of the Basic Criteria for Award of the Blue Angel.

Jury Umweltzeichen

The Environmental Label Jury is the independent, decision-making body for the Blue Angel and includes representatives from environmental and consumer associations, trade unions, industry, the trade, crafts, local authorities, academia, the media, churches, young people and the German federal states.

RAL gGmbH

The RAL gGmbH is the awarding body for the Environmental Label. It organises the process for developing the relevant award criteria in independent expert hearings – which involve all relevant interest groups.

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This document is a translation of a German original. In case of dispute, the original document should be taken as authoritative.

1 Introduction

1.1 Preface

In cooperation with the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection, the German Environmental Agency and considering the results of the expert hearings conducted by RAL gGmbH, the Environmental Label Jury has set up these Basic Criteria for the Award of the Environmental Label. RAL gGmbH has been tasked with awarding the Environmental Label.
Upon application to RAL gGmbH and on the basis of a Contract on the Use of the Environmental Label to be concluded with RAL gGmbH, the permission to use the Environmental Label may be granted to all products, provided that they comply with the requirements as specified hereinafter.
The product must comply with all the legal requirements in the country in which it is to be marketed. The applicant shall declare that the product meets this requirement.

1.2 Background

Furniture and slatted frames can cause environmental pollution across the whole life cycle of the product. Therefore, the requirements for the environmental label focus not only on the substances and materials used in the manufacturing process but also on the period of use, disposal and packaging materials used for the transport of furniture and slatted frames.
Furniture and slatted frames are also used indoors and it will thus be beneficial to the user from a health and environmental perspective if these products have the lowest possible emissions. The environmental label is designed for the labelling of low-emission products. A high level of usability[1] combined with a long service life also play a key role in protecting the environment and health.
In order to evaluate the emissions from furniture and slatted frames made of wood and wood-based materials, the design of these Basic Award Criteria has been based on the evaluation procedure developed by the Committee for Health-Related Evaluation of Building Products – a committee of experts from environmental and health authorities at a federal government and state level.

The harmonised European testing standard for emission testing EN 16516[2] and the international standard for odour testing ISO 16000-28[3] are relevant in this context. Both standards were developed for building products but are also fully applicable to furniture.

As emissions are often associated with odours, which can also have an impact on health, sensory tests are an important element for the evaluation of various products for use indoors. Since March 2012, a measurement method has been available in the DIN ISO 16000-28 standard. This standard describes the method to measure odours from building products in parallel to the measurement of volatile organic compounds (VOC) in test chambers. The use of this standard for furniture in the context of the Blue Angel will be further examined over the next few years. Based on the available data at the time, verification of low odour emissions will be added as an

[1] The requirements in RAL-GZ 430 can be used here as a point of reference. https://www.das-goldene-m.de/de/das-goldene-m
[2] https://www.beuth.de/de/norm/din-en-16516/321737979
[3] https://www.beuth.de/de/norm/din-iso-16000-28/165785344

obligatory requirement in the next term of validity of the Basic Award Criteria. The current Basic Award Criteria recommend that manufacturers carry out odour testing on a voluntary basis.

1.3 Objectives of the environmental label

The environmental label for furniture and slatted frames may be awarded to products that are primarily made of the renewable raw material wood and which – beyond the scope of the legal provisions –

- are manufactured in an environmentally friendly manner
- do not contain any harmful substances that have a detrimental impact during the recycling process

The use of wood from sustainable forestry and low-emission wood-based materials is supported.

Therefore, the following benefits for the environment and health are stated in the explanatory box:

2 Scope

These Basic Criteria apply to ready-to-use indoor furniture and slatted frames made predominantly – i.e. more than 50% by volume – of wood and/or wood-based materials. Window elements and semi-finished products are not covered by the scope of these Basic Award Criteria. The Environmental Label Jury can approve other ready-to-use products made of wood and wood-based materials on the recommendation of the German Environmental Agency (Umweltbundesamt). The term furniture in this context also includes Saunas[4], infrared and office booths, provided that they meet the first sentence of this scope.

3 Requirements

The products named under Paragraph 2 can be labelled with the environmental label illustrated on the first page of these Basic Award Criteria if they fulfil the following requirements:

3.1 Requirements for the wood and coatings

3.1.1 Origin of the wood

It must be ensured that all of the processed wood is sourced from legal and sustainably managed forests. In addition, at least 70% of the wood or 70% of the primary raw materials for the wood-based materials must be from certified sources. In the case of furniture that is wholly or partly

[4] Saunas in the sense of the scope are exclusively the cabins. Sauna ovens are not within the scope of the award.

manufactured out of wood-based materials, waste wood in waste wood categories AI and AII according to the German Waste Wood Ordinance[5] can also be included as part of the 70% target for the primary raw materials used in the wood-based materials. The use of woods from tropical, subtropical and boreal forests[6] is only permitted if they are 100% FSC or PEFC certified. The Blue Angel cannot be awarded to products manufactured using wood found on the list of protected tree species according to CITES and Regulation (EC) 338/97 published by the Federal Agency for Nature Conservation (BfN).[7]

Compliance verification

The applicant shall verify the legality of the wood sources in accordance with EU Regulation 995/2010[8].
Compliance with the requirement for using wood from sustainable forestry can by verified in the following ways:

- *The applicant shall present a record of the woods used each year at the whole production site that specifies the percentage of certified woods used (Annex 2 to the contract DE-UZ 38). A valid certification number from the raw material supplier and an example delivery note that includes a corresponding statement on the certification of the material shall be submitted for certified wood. Certificates from the Forest Stewardship Council (FSC) and the PEFC (Programme for the Endorsement of Forest Certification Schemes) verifying sustainable forestry and a chain of custody (CoC) will be accepted. Comparable certificates and individual verifications are also possible and will be recognised if the applicant can verify compliance with the criteria defined by the FSC or PEFC for the relevant country of origin. As with the federal decree for the purchase of wood products, verification of comparability must be confirmed by the Thünen Institute or the BfN.*
- *If waste wood is used in the production of the wood-based materials, a record of the wood used each year by the panel manufacturer (Annex 3) must also be submitted. This must show at least the average proportion of waste wood that was used during the year (including categorisation of the wood according to the waste wood categories) in the production of the types of wooden panel used in the manufacturer of the furniture. When categorising and monitoring the waste wood, suppliers must comply, in particular, with § 5 and § 6 of the German Waste Wood Ordinance.*
- *If the applicant themselves has chain of custody (CoC) certification according to FSC or PEFC criteria and the product is sold using PEFC or FSC product labels, the applicant shall state his valid certification number, declare compliance with the requirement in Annex 1 and submit the consumer information included with the product label. This means that the FSC/PEFC label/mark (FSC 100 %, FSC Mix or PEFC) must be printed on the product and/or the associated information.*
- *Wood from tropical, subtropical and boreal forests must be explicitly indicated in Annex 2. In addition, the applicant must state the valid certification number held by the raw material supplier and submit example delivery notes stating that the materials are 100% certified. Certificates from the Forest Stewardship Council (FSC) and the PEFC (Programme for the Endorsement of Forest Certification Schemes) verifying sustainable forestry and a chain of*

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5 Manufacturers based outside of Germany can submit comparable verifications to those required in the German Waste Wood Ordinance.
6 Forests in this sense also include plantations.
7 https://www.bfn.de/sites/default/files/BfN/cites/Dokumente/barrierefrei-holzliste-cop-18_01.pdf
8 OJ L 295 from 12 November 2010

custody (CoC) will be accepted. If requested to do so by RAL gGmbH, the applicant shall submit all of the delivery notes.

- *The manufacturer shall state the types of wood used and their countries of origin in Annex 2.*

3.1.2 Formaldehyde in wood-based materials

Wood-based products that have been awarded the environmental label according to DE-UZ 76 may be used to manufacture products according to Paragraph 2. If the wood-based materials have not been awarded the environmental label according to DE-UZ 76, they must comply with the requirements in § 3 of the Chemicals Prohibition Ordinance (ChemVerbotsV) in conjunction with Annex 1, Entry 1, Column 2, Paragraph 1.

Compliance verification

The applicant shall state the manufacturer and product name of the wood-based material that has been awarded the environmental label according to DE-UZ 76. For wood-based materials that have not been awarded the environmental label according to DE-UZ 76, the applicant shall submit a test report[9] according to DIN EN 16516 (with wood consumption of 1.8 m²/m³) or DIN EN 717-1[10] (with a conversion factor of 2.0) according to the notification of analytical methods for the sampling and testing of the substances and substance groups stated in Annex 1 of the Chemicals Prohibition Ordinance[11]. In general, the applicant must request this test report from the manufacturer of the wood-based panels.

3.1.3 General substance requirements for the coating systems

Coating systems are generally used on the products according to Paragraph 2 for design purposes and in order to protect the surfaces. Such coating systems include, for example, stains, primers, clear varnishes, topcoats, foils, decorative papers and adhesives that are directly applied during the manufacture of the furniture.
Observance of European and German chemical law, as well as standard rules for the sector, is a prerequisite; in the case of furniture and slatted frames, this includes, in particular, the REACH Regulation (especially Annexes XIV and XVII)[12], the POP Regulation[13] and the Biocidal Products Regulation[14][15].

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9 The compliance verification can also be provided by submitting a certificate verifying conformity with the ChemVerbotsV (as of 2020) § 3 in conjunction with Annex 1, entry 1, as well as the announcement of analytical procedures for sampling and testing for the substances and substance groups listed in Annex 1 of the ChemVerbotsV in the Federal Gazette of November 5, 2018.

10 www.beuth.de/de/norm/din-en-717-1/72155632

11 https://www.bmu.de/gesetz/verordnung-ueber-verbote-und-beschraenkungen-des-inverkehrbringens-und-ueber-die-abgabe-bestimmter-stoffe-gemische-und-erzeugnisse-nach-dem-chemikaliengesetz

12 Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals, in short REACH

13 Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

14 Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products

15 If other legal regulations also apply to specific products, these also need to be observed.

The coating systems may not contain as constituent components (i.e. substances that remain in the final product where they perform a certain function) any substances[16] classified as:

[1] Substances which are identified as particularly alarming under the European Chemicals Regulation REACH and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "list of candidates"[17]).

[2] Substances which according to the criteria of the CLP Regulation[18] are assigned the following hazard classes and categories or which meet the criteria for such classification:[19],[20]

- carcinogenic in categories Carc. 1A or Carc. 1B
- germ cell mutagenic in categories Muta. 1A or Muta. 1B
- reprotoxic (teratogenic) in categories Repr. 1A or Repr. 1B
- acute toxicity (poisonous) in categories Acute Tox. 1 or Acute Tox. 2
- specific target organ toxicity in categories STOT SE 1, STOT SE 2, STOT RE 1 or STOT RE 2

The corresponding H phrases for the hazard classes and categories can be found in Appendix B.

The following are exempt from the requirements:

- Process-related technically unavoidable impurities in concentrations below the classification thresholds for mixtures.
- Monomers or additives that turn into polymers during the manufacture of plastics or are chemically (covalently) bound to the plastic if their residual concentrations are below the classification limit for mixtures.

Compliance verification

The applicant shall verify compliance with the requirements by submitting a declaration from the coating supplier (Annex 4 to the contract pursuant to DE-UZ 38) and shall also submit the technical data sheets and latest safety data sheets.
The applicant shall enclose with the application (Annex 1) a detailed list of all the materials used in the manufacture of the furniture including the product name, manufacturer/supplier, percentage and function.

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[16] Formaldehyde is exempt from these general requirements. These Basic Award Criteria contain specific requirements for this substance.

[17] The version of the list of candidates at the time of application is valid. The list of candidates in its relevant version can be found at: https://echa.europa.eu/de/regulations/reach/candidate-list-substances-in-articles

[18] Regulation (EC) No. 1272/2008 on classification, labelling and packaging of substances and mixtures, short: CLP Regulation (Classification, Labelling and Packing). It replaces the old directives 67/548/EEC (Dangerous Substances Directive) and 1999/45/EC (Dangerous Preparations Directive).

[19] The harmonized classifications and labellings of hazardous substances can be found in Annex VI, Part 3 of the CLP Regulation. Furthermore, a comprehensive classification and labelling inventory, which also includes all of the self-classifications of hazardous substances made by manufacturers, has been made available to the public on the website of the European Chemicals Agency: ECHA classification and labelling inventory.

[20] Substances with other hazardous properties (i.e. CMR substances in category 2) are not excluded here but are instead restricted by the emissions evaluation (see Paragraph 3.2.).

3.1.4 Foams, textiles and leather

In the case of furniture in which foam accounts for more than 5% of the total volume and/or furniture that is wholly or partially covered with textiles or leather, these materials must comply with the relevant requirements in DE-UZ 117 "Upholstered furniture".

Compliance verification

The applicant shall submit the compliance verifications required in accordance with DE-UZ 117.

3.1.5 Reduction of emissions in the coating process

Operators of plants for the coating of products according to Paragraph 2 must limit the emissions of volatile organic compounds in accordance with the requirements of the 31st BImSchV[21] (solvent or VOC act) by using low-emission coating systems or exhaust gas purification systems.

Compliance verification:

The applicant shall declare compliance with the requirements in Annex 1 to the contract.

3.2 Indoor air quality

Based on the "Health-related Evaluation Procedure for Volatile Organic Compounds Emissions (VOC and VOC) from Building Products"[22] developed by the Committee for Health-Related Evaluation of Building Products (AgBB), products according to Paragraph 2 must not exceed the emission limits stated in Table 1 when measured in a test chamber in accordance with Appendix A: "Method for the detection of emissions of formaldehyde and other volatile compounds".

Table 1: Emission requirements[23]

Compound or substance	3rd day	Final value (28th day)
Total organic compounds within the retention range C_6 – C_{16} (TVOC)[24][25]	≤ 3.0 mg/m³	≤ 0.4 mg/m³
Total organic compounds within the retention range > C_{16} – C_{22} (TSVOC) without LCI	-	≤ 0.1 mg/m³
Carcinogenic substances[26]	≤ 10 µg/m³ **total**	≤ 1 µg/m³ **per single value**
Total VOC without LCI[27]	-	≤ 0.1 mg/m³

[21] 31st Ordinance for the implementation of the Federal Immission Protection Act (ordinance for limiting the emission of volatile organic compounds due to the use of organic solvents in certain installations) from 21 August 2001 (BGBl. I S. 2180), which was last amended by Article 109 of the Ordinance from 19 June 2020 (BGBl. I S. 1328). The currently valid version is valid.

[22] AgBB evaluation procedure, June 2021. Published on the website of the German Environment Agency: https://www.umweltbundesamt.de/themen/gesundheit/kommissionen-arbeitsgruppen/ausschuss-zur-gesundheitlichen-bewertung-von#agbb-gesundheitliche-bewertung-der-emissionen-von-fluchtigen-organischen-verbindungen-aus-bauprodukten. The currently valid version is valid.

[23] The values in Table 1 are subject to mathematical rounding, a value of 1 could thus mean e.g. a maximum of 1.49.

[24] 1) The following applies to the final value according to AgBB: Total VOC (C_6-C_{16}) and SVOC with LCI

[25] In the case of solid wood furniture according to DIN 68871 "Furniture – Designations and their use", acetic acid is not taken into account for the TVOCs. However, it is included in the "R value".

[26] see 3.1.3 [2]: carcinogenic in categories Carc. 1A or Carc. 1B

[27] LCI = Lowest Concentration of Interest; see AgBB evaluation procedure (Footnote 13)

Compound or substance	3rd day	Final value (28th day)
R value[28]	-	≤ 1
Formaldehyde[29]	-	≤ 37 µg/m³ (0.030 ppm)

The test can be terminated from the 7th day after preparing the test specimen if the required final values for the 28th day are reached prematurely and no significant increase in the concentration of any of the identified substances has been observed in comparison to the measurement on the 3rd day.

Compliance verification

The applicant shall submit a test report according to the DIN EN 16516 standard [Section 10] verifying compliance with this requirement. The test report must be produced by a testing institution recognised for this test by BAM (Bundesanstalt für Materialforschung und Prüfung (Federal Institution for Material Research and Testing)[30]. In addition, the specific requirements in Appendix A must be observed. Appendix A is still valid with respect to the ability to distinguish in the BAM test method between a whole-product test and a component test. In the case of a component test, the applicant can split the emission test between initial and follow-up tests in accordance with Appendix A, Item 7. The results of the first follow-up test must be submitted without request to RAL gGmbH by 31 December of the year that ends two years after the Contract on the Use of the Environmental Label was concluded.

3.2.1 Emissiontest for office booths

For office booths, two emission tests must be performed that have different reference points.

a. emissions of the office booth into the surrounding large space
b. emissions of the materials into the interior of the booth

For a: The office booth is tested in a large test chamber (e.g. 20m³) after 3 and 28 days in the opened condition. The limit values from 3.2 must be complied with.

For b: The office booth is set up in a suitable room (of the commissioned test laboratory). After 3 days in the closed condition and with the ventilation switched off, a sample of the indoor air is taken and analyzed. The limit values from 3.2 (day 28) must be complied with.

Textile floor coverings located in the office booth can either bear the DE-UZ 128 or must meet the requirements of DE-UZ 128 for emission and odor testing in a separate test.

Compliance verification

The applicant shall submit a test report according to the DIN EN 16516 standard [Section 10] verifying compliance with this requirement. The test report must be produced by a testing

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[28] R = total of all quotients (C_i / LCI_i) < 1 (where C_i = substance concentration in the chamber air, LCI_i = LCI value of the substance), see AgBB evaluation procedure (Footnote 13)

[29] In addition, for saunas and infrared cabins the gas analysis value must be determined in accordance with DIN EN ISO 12460-3:2021-02 at a temperature of 90 °C and this value must be ≤ 0.4 mg/m²h.

[30] https://www.blauer-engel.de/sites/default/files/2022-01/Testing-Institutes-e-2022-01-28.pdf

institution recognised for this test by BAM (Bundesanstalt für Materialforschung und Prüfung (Federal Institution for Material Research and Testing)[30]

3.2.2 Odour test (optional)

Testing of the odour characteristics should be carried out in accordance with DIN ISO 16000-28 together with the emission test for Paragraph 3.2 (indoor air quality). As an alternative to DIN ISO 16000-28, an odour test in accordance with RAL-GZ 430 is also possible.

Compliance verification

The applicant shall submit a test report in accordance with the DIN ISO 16000-28 standard in combination with VDI 4302. Alternatively, the applicant shall submit a test report in accordance with RAL-GZ430.

3.3 Special requirements

3.3.1 Halogens

No halogenated organic compounds may be used (e.g. as binding agents, flame retardants) in the manufacture of the products, including in the materials used for their manufacture (wood-based materials, adhesives, coatings, etc.). Electrical components (e.g. cables, plugs) that may be separated during disposal are exempt from this requirement.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract according to DE-UZ 38.

3.3.2 Flame retardants

The following flame retardants may be used: inorganic ammonium phosphates (diammonium phosphate, ammonium polyphosphate, etc.), other dehydrating minerals (aluminium hydroxide or similar) and expandable graphite. Antimony oxides may not be used as flame retardants.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract according to DE-UZ 38.

3.3.3 Biocides

The use of biocides is not permitted. An exception is made for biocides that are exclusively designed for use as in-can preservatives.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract according to DE-UZ 38.

3.3.4 Packaging materials

If possible, products according to Paragraph 2 should be packaged for sale so that the outgassing of volatile materials is possible after the manufacturing process. The product packaging must be made out of recyclable materials where possible.

Compliance verification

The applicant shall submit a description of the packaging system and declare that the packaging system has been designed to allow the outgassing of volatile components or shall state the reasons why such packaging is not possible or why the packaging cannot be made out of recycled materials.

3.4 Use of materials

3.4.1 Wearing parts

The provision of functionally compatible spare parts for those parts of the product according to Paragraph 2 that are subject to wear e.g. hinges, locks and pull-out components must be guaranteed for at least 5 years. Lights and light fixtures are exempt from this requirement.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract according to DE-UZ 38.

3.4.2 Design

The principles for a recycling-friendly design (VDI 2243[31]) must be observed. The use of recyclable materials is preferable.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract according to DE-UZ 38.

3.4.3 Plastic parts

Plastic parts > 50 g should be labelled in accordance with DIN EN ISO 11469[32] and should not contain any additional materials that will hinder their recycling.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract according to DE-UZ 38.

3.5 Consumer information

The following information should be made available to consumers (either digitally or enclosed with the product):

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[31] VDI 2243:2002-07 Recycling-oriented product development

[32] DIN EN ISO 11469:2017-01 Plastics – Generic identification and marking of plastics products (ISO 11469:2016); German version EN ISO 11469:2016

- Information on wearing parts and their repair or replacement, as well as about a repair service where applicable. The provision of functionally compatible spare parts for these wearing parts must be guaranteed for at least 5 years;
- Information on the type and origin of the predominant wood in accordance with Paragraph 3.1.1;
- Information on other materials (proportion > 3 % by mass);
- Instructions on the assembly or installation of the products;
- Instructions on disassembly for moving house and for the purpose of recycling the materials in the future;
- Information on the fitness for use (field of application and results of the material tests where relevant).
- Information on the packaging made of recycled materials.

Compliance verification

The applicant shall submit the consumer information.

3.6 Advertising claims

- Advertising claims must not include any information such as "tested for its biological living quality" or claims in the sense of § 25 (4) of the CLP Regulation (EC) No. 2008/1272 that could play down the risks (e.g. "non-toxic", "non-harmful to health", free of ...).
- Product names that contain terms such as "Bio", "Eco" or similar are not permitted.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract according to DE-UZ 38.

3.7 Social criteria

In order to comply with the fundamental principles and rights with respect to human rights and working conditions (ILO fundamental labour standards), the manufacturer of the product to be certified with the ecolabel must have its own code of conduct and also have defined a code of conduct for its suppliers that covers at least compliance with human rights, labour standards and environmental risks and includes a suitable and effective risk management system.

Compliance verification

The furniture manufacturer shall declare compliance with the requirement for all materials added to the product in Annex 1.

3.8 Outlook

The aim is to introduce obligatory odour tests for UZ 38 in future. Sufficient data has not been available for this purpose up to now. Therefore, the Blue Angel welcomes the submission of voluntary test reports by applicants for odour tests carried out in accordance with DIN ISO 16000-28:2021-11. While the use of odour tests is being examined, voluntary odour tests carried out in accordance with RAL GZ 430 are also welcomed to help with the further development of the Basic Award Criteria.

4 Applicants and Parties Involved

Manufacturers of final products according to Paragraph 2 shall be eligible for application.

Parties involved in the award process are:
- RAL gGmbH to award the Blue Angel environmental label,
- the federal state being home to the applicant's production site,
- Umweltbundesamt (German Environmental Agency) which after the signing of the contract receives all data and documents submitted in applications for the Blue Angel in order to be able to further develop the Basic Award Criteria.

5 Use of the environmental label

The use of the environmental label by the applicant is governed by a contract on the use of the environmental label concluded with RAL gGmbH.

Within the scope of such contract, the applicant undertakes to comply with the requirements under Paragraph 3 while using the environmental label.

Contracts on the Use of the Environmental Label are concluded to fix the terms for the certification of products under Paragraph 2. Such contracts shall run until 31 December 2028.
They shall be extended by periods of one year each, unless terminated in writing by 31 March 2028 or 31 March of the respective year of extension.
After the expiry of the contract, the Environmental Label may neither be used for labelling nor for advertising purposes. This regulation shall not affect products being still in the market.

The applicant (manufacturer) shall be entitled to apply to RAL gGmbH for an extension of the right to use the ecolabel on the product entitled to the label if it is to be marketed under another brand/trade name and/or other marketing organisations.

The Contract on the Use of the Environmental Label shall specify:
- Applicant (manufacturer)
- Brand/trade name, product description
- Distributor (label user), i.e. the above-mentioned marketing organisations.

Appendix A Method for testing the emissions of volatile organic compounds for the award of the environmental label

1. Definitions

Component

Part of a complete piece of furniture (e.g. door, shelf board, side board, backing, drawer) or of another product made of wood and wood-based materials including different surfaces and materials in a ready-for-shipment state that does not undergo any further changes (varnishing, bonding, drilling, milling etc.).

Component test

Testing of a component.

Emission area

Area of a test specimen that is capable of emissions and which comes into contact with the ambient air in the emission test chamber. For testing in the emission test chamber, the actual surfaces and also the narrow faces should be included in the calculation of the emission area. Cabinet furniture should be tested in an opened state. Unvarnished glass and metal surfaces should not be included.

Emission test chamber

Closed container with controlled operating parameters that is used to determine the emission of volatile organic compounds from furniture.

Volatile Organic Compound (VOC)

General: Organic compounds that are emitted from the test specimen and detected in the chamber air. In the context of this test method, these are the identified and unidentified organic compounds eluting between and including n-hexane and n-hexadecane on a gas chromatographic separation column (capillary column with 5% phenylpolysiloxane / 95% methylpolysiloxane), including these compounds.

Whole-product test

Testing of a whole product (e.g. piece of furniture).

Area-specific air flow rate (q [m^3/m^2h])

The quotient of the air flow rate and the emission area of the test specimen.

Air change rate (n [h^{-1}])

The quotient of the volumetric air flow rate and the free volume of the emission test chamber.

Air flow rate (°V [m^3/h])

Volumetric air flow rate supplied to the emission test chamber per unit time.

Air velocity (v [m/s])

Air velocity over the surface of the test specimen (distance: 10 mm).

Product loading factor (L [m²/m³])
Quotient of the emission area of the test specimen and the volume of the emission test chamber.

Sample material
Piece of furniture or component taken from the production process for test purposes.

Test specimen
Samples selected for the emission test (piece of furniture, component or parts thereof cut to the required size).

Narrow faces
Side faces of a three-dimensional test specimen.

2. Test material
The final products covered by the scope of the Basic Award Criteria differ with regards to their shape, materials and number of materials used. Therefore, the test procedure and test specimens must be selected in each individual case by the testing institution in consultation with the manufacturer.

There are two test methods for furniture made out of wood and wood-based materials with three-dimensional surfaces:

a) Whole-product test
especially for small furniture, chairs etc.

b) Component test
especially for unit furniture and furniture programmes with identical components.

2.1 Whole-product test
The product to be tested must be taken directly from current production. Parts from suppliers must not be more than 10 days old. Exceptions to this rule may be made if the manufacturer can prove that some of the supplied parts used during normal production are frequently more than 10 days old.

The product must be packaged with an air-tight seal immediately after being produced. Cabinet furniture must be packaged in a closed state.

2.2. Component test
In the case of component tests, e.g. for furniture programmes, the components to be tested must be selected by the testing institution in consultation with the manufacturer. The different materials used, especially different coating systems, must be taken into account in this process. The components must be selected in such a way that ensures that the tested product complies with the requirements in the Basic Award Criteria. No sampling and emission tests are required for components that account in total for less than 5% of the area of the product.

The components to be tested must be taken in sufficient quantities directly from current production. Parts from suppliers must not be more than 10 days old. Exceptions to this rule may be

made if the manufacturer can prove that some of components used during normal production are frequently more than 10 days old. In the case of flat components, a stack of at least 3 components should be selected and only the middle piece should be used for the emission test.

The exact sample quantity must be agreed with the testing institution, taking into account the size of the component and the size of the test chamber to be used for the emission test. Samples of the same components must be immediately packaged together with an air-tight seal. In doing so, the individual samples should be packaged as close to one another as possible in order to keep any unavoidable emissions during the transport of the samples to the testing institution as low as possible.

2.3. Transport

The packaged samples must be transported as quickly as possible to the testing institution. No more than 7 days may pass between packaging and arrival at the testing institution.

3. Preparation of the sample

The sample material must be stored in its packaging at the testing institution until the test specimens are prepared.
In the case of flat components, only the components in the middle of the stack – and not the outer components – should be used to prepare the test specimens for the emission test.
Components and whole products can be tested in their original condition in a large test chamber. Low quantities of semi-volatile organic compounds that may be found in the tests should also be taken into account. As a rule, test specimens that can be tested in a test chamber suitable for the testing of volatile organic compounds should be taken from the sample material. The test specimens should be representative of both the materials used and the different surfaces of the component. Narrow faces that are exposed due to cutting the material should be sealed using suitable seals.

Self-adhesive, low-emission aluminium foil has proved to be suitable for this purpose. Carry out preliminary tests to determine any possible emissions from the aluminium foil itself.

The two surfaces and the narrow faces (excluding the surfaces exposed due to cutting the material that have been subsequently sealed) must be included in the calculation of the total emission area. If the test specimen includes components that are not flat (e.g. chairs, stools, etc.), all of the surfaces that come into contact with the ambient air should be used to determine the emission area.

The test specimens must be placed into the test chambers immediately after being prepared or they must be stored in a packaged condition until they are loaded into the chamber.
For your own internal documentation, a sampling log should be kept for every test specimen.
The time between packaging the samples at the manufacturer's site and loading them into the chamber must be kept as short as possible. The emission test according to DIN EN 16516 must be completed within 8 weeks of producing the samples, provided that the test specimens have been stored in the laboratory in the described packaging under normal indoor conditions. The test report must document the process for preparing the test specimens, the receipt of the test specimens and the start of the test.

4. Test chamber measurement

The test chambers must comply with the requirements specified in DIN EN 16516.
The following test conditions must be met:

Temperature (T)	23 °C	±	1 K
Relative humidity (RH)	50	±	5%
Air change (n)	0.5 – 2.0 h-1	±	3%
Chamber load (a)	0.5 – 2.0 m²/m³	±	3%
or area-specific air flow rate q = n/a	1.0 m³/m²h	±	0.1 m³/m²h
Air flow velocity (v) surrounded on all sides by ambient air (cf. [4])	0.1 - 0.3m/s		
Test chamber size	≥ 100 L		

Prior to loading the chamber, the blank value for the empty chamber must be determined. The blank value must not exceed 2 μg/m³ for individual substances and 0.5 μg/m³ for carcinogenic substances. The total of all blank values for the individual substances must not exceed 20 μg/m³. To determine the blank value for the test chamber, the adsorbent blank value must be determined and deducted.

It is not permitted to jointly test different individual components. In justified exceptional cases, e.g. if a piece of furniture is bigger than a large test chamber, it is permitted to test a downscaled piece of furniture or corresponding portions of furniture parts in accordance with Section 3. If the piece of furniture includes rows of holes, these must be taken into account in the component. Tests of the whole product (e.g. for cabinet furniture) must be completed in an open state.

5. Air sampling and analysis methods

Sampling to test for VOCs and SVOCs must be carried out using Tenax followed by thermodesorption and an analysis by GC/MSD. To test for short-chain aldehydes and ketones, the sampling process must be carried out using cartridges containing a sorbent coated in 2,4-Dinitrophenylhydrazine (DNPH). The desorption process should be carried out using acetonitrile, while the separation and identification processes should be completed using HPLC in a UV absorption detector or diode array detector.

Sampling to test for short-chain carbonyl compounds using DNPH cartridges should be carried out at the same time as the sampling to test for VOCs and SVOCs using Tenex, at least at the following times:

3rd day (72 ± 2 h after loading)
28th day (28 ± 6 h after loading)

The test can be terminated at an early stage (at the earliest on the 7th day after preparing the test specimen) if the permissible emission values for the 28th day have been reached early and no significant increase in the concentration of any of the identified substances has been observed in comparison to the measurement on the 3rd day.

In accordance with the AgBB procedure, all substances should be identified as far as possible and at least the substances with an LCI value should be specifically quantified. If technically feasible, the quantification limit for each VOC and SVOC should be 1 µg/m3. Carcinogenic substances in categories CARC 1A and CARC 1B (according to Regulation (EC) No. 1272/2008) as well as mutagenic and reprotoxic substances that are target compounds must –where necessary and technically feasible – be quantified and stated from a concentration of 1 µg/m³. On each testing day, values for the sum of the concentrations of all TVOCspez – i.e. all of the specific identified target compounds quantified using substance-specific calibration standards, plus all of the non-target compounds identified and all of the unidentified compounds, quantified using the TIC response factor for toluene with concentrations > 5 µg/m³ – whose retention times are between hexane and hexadecane must be determined. For semi-volatile organic compounds (SVOC), meaning compounds whose retention times are between n-hexadecane and n-docosane, the sum (TSVOC) of all the identified compounds quantified with a concentration > 5 µg/m³ must also be determined. SVOCs for which LCI values have been defined must be included in the calculation of the "R value". SVOCs with an LCI value will be included in the calculation for TVOCspez on the 28th day according to the AgBB procedure and not in the calculation of the TSVOC.

6. Evaluation and test report

In the case of component tests, the total concentrations of volatile organic compounds determined for the individual components may be used to extrapolate the total concentrations in the whole product using the following calculation formula, based on the known proportions of the total area of the whole product accounted for by the tested components. For this purpose, the proportion of the total area of the whole product accounted for by each component must be calculated and entered into the formula together with the emission values determined in the test for each component:

$$C_{Calc.} = \frac{\sum_{i=1}^{n} A_i(>5\%) * C_i}{\sum_{i=1}^{n} A_i(\%)}$$

$C_{Calc.}$	Calculated total concentration for the whole product in µg/m³
n	Number of components tested
i	Component index
$A_i(\%)$	Proportion of the total area covered by the ith component in %
Ci	Concentration of the ith component in µg/m³

This procedure is unnecessary if none of the tested components exceed the permissible emission values or if the whole product has been tested.

The measurement uncertainty stated in the test method is neither added nor subtracted.

The test report must document the entire test, including the preparation of sample material (especially the selection of the components) and test specimens, as well as the complete evaluation of the product.

In particular, the following information must be provided:

- Manufacturer,
- Precise product designation (including batch, date of production, varnishing/painting),
- Date of manufacture, date of receipt,
- Type of packaging,
- Test date / period,
- Production of the test specimens (dimensions),
- Test conditions (type and size of the chamber, temperature, relative humidity, air change rate, air flow rate and product loading factor, area-specific air flow rate, time and duration of air sampling, volume andvolumetric flow of air sampling),
- Name, CAS no. and concentration of the identified VOCs as well as the concentration of the unidentified VOCs on the 3rd and 28th day and their totals (TVOC3 and TVOC28),
- Name, CAS no. and concentration of the identified SVOCs as well as the concentrationof the unidentified SVOCs on the 3rd and 28th day and their totals (TVOC28),
- Name, CAS no. and concentration of the identified carcinogenic substances and their totals on the 3rd and 28th day,
- Calculated "R value" on the 28th day
- Indication of the formaldehyde concentration on the 3rd and 28th day

7. Initial and follow-up tests

For whole-product tests, all products must be subjected to an emission test.

For component tests of furniture programmes, the testing institution must select – in consultation with the manufacturer – a representative number of test specimens for the initial test in accordance with the table below. The test specimens must be selected based on the surface area covered by all of the different components making up the whole product (see Section 2.2). This process should take different surfaces and materials into account.

In the case of new applications, these tests must not be more than two years old.

Number of different components (see 2.2)	Minimum number of representative initial tests	Minimum number of follow-up tests after two years
up to 4	2	1
up to 7	3	1
up to 11	4	2
up to 15	5	3
from 15	33% of the number of components	20% of the number of components

In order to ensure the uniform quality of products certified with the Blue Angel, all products tested as whole products must undergo a second test after 6 years. If the product is tested in a

component test, follow-up tests must be completed every two years in accordance with the table above so that all components have been tested after 6 years.
If individual parameters are exceeded during a follow-up test, the applicant must verify compliance with Paragraph 3.2.1 of the Basic Award Criteria for the whole product.

8. Testing institutions

The emission test may only be performed by suitable institutions.
Testing institutions are considered to be qualified if they possess the necessary apparatus and a quality management system (or are accredited for these tests) and have demonstrated their qualifications to perform such tests by successfully participating in relevant round robin tests. Verification of compliance with these requirements must be submitted to the Federal Institution for Material Research and Testing (BAM), Division 4.2 "Materials and Air Pollutants".

9. Literature

DIN ISO 16000-3
Indoor air -
Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air – Active sampling method (2008, draft standard of 2010)

DIN ISO 16000-6
Indoor air -
Part 6: Determination of volatile organic compounds in indoor and chamber air by active sampling on TENAX TA®, thermal desorption and gas chromatography using MS or MS-FID (2004, draft standard 2010)

DIN EN 16516
Construction products – Assessment of release of dangerous substances – Determination of emissions into indoor air; German version EN 16516:2017

DIN EN ISO 16000-10
Indoor air – Part 10: Determination of the emission of volatile organic compounds from building products and furnishing – Emission test cell method (2006)

ISO 16000-28
Indoor air – Part 28: Determination of odour emissions from building products using test chambers (2012)

DIN EN 717-1
Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method (2005).

Further reading:

Entwicklung eines Prüfverfahrens zur Ermittlung der Emission flüchtiger organischer Verbindungen aus beschichteten Holzwerkstoffen und Möbeln (Development of a test method for determining volatile organic compounds emitted from coated wood-based materials and furniture).

UBA project No. 204 08 515/02, Federal Institute for Materials Research and Testing (BAM), Final Report, Berlin, 1999. UBA Texts 74/99

Salthammer, T.:
Untersuchungen zur Entwicklung und Anwendung einer praxisnahen Materialprüfmethode für flüchtige organische Stoffe aus Möbelbeschichtungen (Studies on the development and applications of a practically relevant material test method for volatile organic substances emitted from furniture coatings). Final report on the research project. WKI, Braunschweig, November 1995.

Jann, O.; Wilke, O.; Brödner, D.:
Procedure for the determination and limitation of VOC-emissions from furnitures and coated wood based products. Proceedings of Healthy Buildings/Indoor Air Quality (IAQ) '97, Volume 3: 593-598.

Appendix B H-phrases applicable for the award of the Blue Angel

Hazard categories	H-Phrases	Hazard statements
Carcinogenic substances		
Carc. 1A, 1B	H350	May cause cancer.
Carc. 1A, 1B	H350i	May cause cancer if inhaled.
Germ cell mutagenic substances		
Muta. 1A, 1B	H340	May cause genetic defects.
Reprotoxic (teratogenic) substances		
Repr. 1A, 1B	H360D	May damage the unborn child.
Repr. 1A, 1B	H360F	May damage fertility.
Repr. 1A, 1B	H360FD	May damage fertility. May damage the unborn child.
Repr. 1A, 1B	H360Df	May damage the unborn child. Suspected of damaging fertility.
Repr. 1A, 1B	H360Fd	May damage fertility. Suspected of damaging the unborn child.
Acute toxicity substances		
Acute Tox. 1 Acute Tox. 2	H300	Fatal if swallowed
Acute Tox. 1 Acute Tox. 2	H310	Fatal in contact with skin
Acute Tox. 1 Acute Tox. 2	H330	Fatal if inhaled
Substances with specific target organ toxicity		
STOT SE 1	H370	Causes damage to organs.
STOT SE 2	H371	May cause damage to organs.
STOT RE 1	H372	Causes damage to organs through prolonged or repeated exposure.
STOT RE 2	H373	May cause damage to organs through prolonged or repeated exposure.