

# **BLUE ANGEL**

**The German Ecolabel**



## **Household Microwave Ovens**

**DE-UZ 149**

**Basic Award Criteria**

**Edition July 2010**

**Version 1**

## The Environmental Label is supported by the following four institutions:



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



The German Environmental Agency with its specialist department for "Ecodesign, Eco-Labeling 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.



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.



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.

If you require further information please contact:

RAL gGmbH

**RAL UMWELT**

Fränkische Straße 7

53229 Bonn

Tel: +49 (0) 228 / 6 88 95 - 0

E-Mail: [umweltzeichen@ral.de](mailto:umweltzeichen@ral.de)

[www.blauer-engel.de](http://www.blauer-engel.de)

**Prolongation without any change for 1 year, until 31.12.2014**  
**Prolongation without any change for 2 years, until 31.12.2016**

**Prolongation without any change for 2 years, until 31.12.2018**

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Specimen Contract

## **1 Introduction**

### **1.1 Preface**

The Environmental Label Jury has set up these Basic Criteria for Award of the Blue Angel Environmental Label in co-operation with the Federal Minister for the Environment, Nature Conservation and Nuclear Safety, the Federal Environmental Agency and considering the results of expert hearings conducted by RAL gGmbH. 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 Blue Angel eco-label may be granted for all products, provided that they comply with the requirements specified hereinafter.

### **1.2 Background**

Microwave ovens are used to quickly heat and re-heat food. The possibility to prepare foods directly on microwave ware represents a considerable gain in comfort. Particularly energy-efficient microwave ovens help to protect the earth from climate change. In addition, and especially when cooking small quantities of food, microwave heating of food can provide energy savings compared to conventional cookers or ovens.

Considering the entire life cycle of a product, the environmental impact is primarily determined by the period of use whereas the manufacture only accounts for about 15-20 percent of the greenhouse gas emissions.

Despite the high level of equipment with microwave appliances of about 70% of German households many people have reservations about cooking food in microwaves. Irregular heat distribution may impair sensitive food. This can, however, be avoided by a proper preparation. Such reservations can be dispelled by microwave ovens with particularly low radiation leakage and detailed information on gentle cooking, such as for example:

- Setting of compensation times,
- Proper selection of the power level as well as
- Stirring.

### 1.3 Goals of the Blue Angel Eco-Label

Reduction of energy consumption as well as the avoidance of pollutants and wastes are major goals of environmental protection. Pursuit of these goals will help protect the earth's climate, conserve resources and avoid the input of pollutants into the environment. The Blue Angel eco-label for microwave ovens may be awarded to appliances featuring the following environmental properties:

- low energy consumption;
- low radiation leakage;
- long-lived and recyclable design;
- avoidance of environmentally harmful materials.

## 2 Scope

These Basic Award Criteria apply to microwave ovens and combination microwave ovens for household use.

A combination microwave oven is a system providing not only the microwave oven function but also other cooking functions, such as forced-air function<sup>1</sup>, grill function, steam cooking function or conventional heating function.

## 3 Requirements

### 3.1 Efficiency of the Microwave Function

The efficiency of the microwave function shall not fall below the following values:

- Microwave ovens and combination microwave ovens without conventional heating function and forced-air function: 59 %;
- Combination microwave ovens with conventional heating function and/or forced-air function: 54 %;
- Combination microwave ovens with conventional heating function and/or forced-air function, provided that the appliance is equipped with a rotating plate that cannot be deactivated: 59 %.

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<sup>1</sup> Heat transmission to the food by forced-air convection, i.e. circulation of the air with the help of a fan. This does not include forced-air functions which operate a grill element only.

### **Compliance Verification**

*The applicant shall declare compliance with the requirement, indicate the efficiency and submit a measurement protocol prepared by a DIN EN ISO/IEC 17025 accredited testing laboratory. Efficiency shall be measured in accordance with DIN EN 60705:1999 + A1:2004 + A2:2006.*

## **3.2 Energy Consumption in Baking Oven Mode**

Additional requirement for combination microwave ovens with a rotating plate that can be deactivated and those without rotating plate:

Combination microwave ovens with conventional heating function<sup>2</sup> or forced-air function shall meet the energy consumption requirements set forth in EU Directive 2002/40/EC for baking ovens rated energy efficiency class A:

- 12 l ≤ volume < 35 l     < 0.6 kWh
- 35 l ≤ volume < 65 l:     < 0.8 kWh
- 65 l ≤ volume:             < 1.0 kWh.

### **Compliance Verification**

*Compliance shall be established by presentation of measurement protocol prepared by a DIN EN ISO/IEC 17025 accredited testing lab. The energy consumption measurement shall be made in accordance with DIN EN 50304/DIN EN 60350:2009. The protocol shall give the measured values for conventional heating function and forced-air function. The values shall be given in accordance with the calculation sheet of the standard (Annex E), Table 1.*

## **3.3 Power Consumption in Standby and Off Mode**

Power consumption of the microwave oven or combination microwave oven in standby or Off mode (according to EC Regulation 1275/2008/EC) shall not exceed 0.5 watts without display and 1.0 watt with display. The respective value shall be specified.

### **Compliance Verification**

*Compliance with the above-mentioned power consumption value shall be established by measurement in accordance with DIN EN 62301:2005<sup>3</sup> and by presentation of a*

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<sup>2</sup> Food is cooked by radiation and natural convection only. This does not include appliances using a top heating element only (e.g. grilling function).

*measurement protocol prepared by a DIN EN ISO/IEC 17025 accredited testing laboratory. The respective value shall be specified .*

### **3.4 Interior Light ON when Door is Open**

If the interior light of a microwave oven or combination microwave oven is activated after opening the door it must automatically switch off within a period of 20 minutes.

The product documentation shall include information on the above requirement.

#### ***Compliance Verification***

*The applicant shall declare compliance with the requirement and submit the relevant pages of the product documentation.*

### **3.5 Radiation Leakage**

Radiation leakage of the microwave oven or combination microwave oven shall not exceed 1 W/m<sup>2</sup>.

#### ***Compliance Verification***

*The applicant shall establish compliance with this requirement by measurement according to DIN EN 60335-2-25 and submit a corresponding measurement protocol prepared by a DIN EN ISO/IEC 17025 accredited testing laboratory. Evaluation shall be based on the measured average radiation leakage of five new appliances. Applicant shall list the five measured values.*

### **3.6 Reparability**

The applicant undertakes to make sure that the spare parts provision for appliance repair is guaranteed for at least 5 years from the end of production.

Spare parts are those parts which, typically, may break down within the scope of the ordinary use of a product - whereas those parts which normally exceed the life of the product are not to be considered as spare parts.

Aesthetic components shall be exempt from this requirement.

The product documentation shall include information on the above requirements.

#### ***Compliance Verification***

*The applicant shall declare compliance with the requirement and submit the corresponding pages of the product documentation.*

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<sup>3</sup> Household electrical appliances – Measurement of Standby Power

### 3.7 Recyclable Design

Blue Angel eco-labelled appliances shall meet the following requirements for recyclable design:

- The appliances shall be so designed as to allow an easy disassembly for recycling purposes to make sure that case plastics and metals can be separated as fractions from materials of other functional units and, if possible, be recycled.
- The appliances shall be so designed as to support specialist disassembly by intelligently designed connections or allow disassembly by use of ordinary tools.
- Specialist firms hired by the manufacturer to recycle the appliances shall receive information for appliance disassembly.
- The appliance recycling strategy developed with respect to the above points shall be published on the internet.

#### ***Compliance Verification***

*The applicant shall declare compliance with the requirements, submit the recycling strategy with the respect to the above points and give the internet link for information on the recycling strategy.*



### 3.8 Material Requirements for Plastics used in Case, Case Parts and Operating Elements

The plastics must not contain as constituent parts any substances classified as:

- a) carcinogenic in categories 1 or 2 according to Table 3.2 of Annex VI to EC Regulation 1272/2008<sup>4</sup>,
- b) mutagenic in categories 1 or 2 according to Table 3.2 of Annex VI to EC Regulation 1272/2008,
- c) reprotoxic in categories 1 or 2 according to Table 3.2 of Annex VI to EC Regulation 1272/2008,
- d) persistent, bioaccumulative and toxic (PBT substances) or very persistent and very bioaccumulative (vPvB substances) according to the criteria of Annex XIII to the REACH Regulation or particularly alarming for other reasons and included into the List (so-called list of candidates<sup>5</sup>) set up in accordance with REACH, Article 59, paragraph 1.

Halogenated polymers shall not be permitted. Neither may halogenated organic compounds be added as flame retardants. Moreover, additions of flame retardants labelled with the Risk Phrase R 50/53 pursuant to Table 3.2 of Annex VI to EC Regulation 1272/2008 shall not be permitted.

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<sup>4</sup> Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006, Annex VI on harmonized classification and labelling of hazardous substances, Part 3: Harmonized classification and labelling, Tables, Table 3.2, – List of harmonized classification and labelling of dangerous substances from Annex I to Directive 67/548/EEC,

short: GHS-Regulation [http://www.reach-info.de/ghs\\_verordnung.htm](http://www.reach-info.de/ghs_verordnung.htm), each as amended.

The GHS Regulation (Global Harmonization System), that has come into force on January 20, 2009, replaces the old Directives 67/548/EEC and 1999/45/EC. According to the said regulation, substances are classified, labelled and packed until December 1, 2010 according to Directive 67/548/EEC (Dangerous Substances Directive) while mixtures are classified, labelled and packed until June 1, 2015 according to Directive 1999/45/EC (Dangerous Preparations Directive). Notwithstanding this, the classification, labelling and packaging of substances and preparations may be performed according to the provisions of the GHS Regulation already before December 1, 2010 or June 1, 2015, respectively. In such case, the provisions of Dangerous Substances Directive or Dangerous Preparations Directive shall not be applicable.

<sup>5</sup> Link to the list of candidates of Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH):

[http://echa.europa.eu/consultations/authorisation/svhc/svhc\\_cons\\_en.asp](http://echa.europa.eu/consultations/authorisation/svhc/svhc_cons_en.asp)

The following shall be exempt from this rule:

- process-related, technically unavoidable impurities;
- fluoroorganic additives (as, for example, anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed 0.5 weight percent;
- plastic parts weighing less than 25 grams.

#### **Compliance Verification**

*Applicant shall declare compliance with the requirements and submit a written declaration from the plastic manufacturers or suppliers or request the submission of such declaration to RAL gGmbH. Such declaration shall confirm that the substances to be banned have not been added to the plastics and give the chemical designation of the flame retardants used, including CAS-No.*

### **3.9 Organic Solvents in Paints and Varnishes used for Case Coatings**

Moreover, the organic solvent content of paints and varnishes used in case coatings must not exceed 250 g/l.

Calculation shall be based on the following formula:

$$\text{VOC value [g/l]} = \frac{\text{mass of volatile components [g]} - \text{mass of water [g]}}{\text{volume of coating material [l]} - \text{volume of water [l]}}$$

The volatile organic compounds (VOC) content of the coating material equals the mass of volatile components without water in relation to the volume of the coating material minus the volume of the water contained therein. The VOC value refers to the ready-to-use coating material, including the dilutions prescribed or recommended by the varnish manufacturer. The terms are defined in accordance with DIN 55945 "Paints and varnishes - Terms and definitions for coating materials". Painting plants equipped with waste-gas treatment systems meeting the requirements of Annex III No 8.1 to the 31<sup>st</sup> BImSchV (Federal Immission Control Ordinance) and TA Luft (German Technical Instructions on Air Quality Control) shall be exempt from these requirements.

#### **Compliance Verification**

*The applicant shall declare compliance with the requirement.*

### **3.10 Insulating Materials**

If fibrous insulation materials (mineral wool, glass wool, rock wool) according to DIN 51001 are used in the microwave oven or combined microwave oven the carcinogenicity index of the products concerned KI equals or exceeds 40 and, hence, the insulating materials used need not be classified as carcinogenic or suspected of causing cancer according to the current classification scheme of TRGS 905.

Ceramic mineral fibres, i.e. glassy (silicate) fibres with an alkali metal oxide and earth alkali metal oxide content ( $\text{Na}_2\text{O} + \text{K}_2\text{O} + \text{CaO} + \text{MgO} + \text{BaO}$ ) of less than or equal to 18 weight percent must not be used.

#### ***Compliance Verification***

*The applicant shall present a measurement protocol prepared by a testing laboratory accredited according to DIN EN ISO/IEC 17025. The carcinogenicity index shall be determined in accordance with TRGS 905 on the basis of the measured values determined according to DIN 51001.*

### **3.11 Formaldehyde Emissions**

When first heating the appliance the formaldehyde concentration must not exceed 0.2 ppm in the indoor air (without air change), and it must not exceed 0.1 ppm during repeated heating.

#### ***Compliance Verification***

*The applicant shall declare compliance with the formaldehyde requirement. Compliance shall be established by presentation of a measurement protocol prepared by a DIN EN ISO/IEC 17025 accredited testing laboratory. The measurement shall be made under the test conditions set forth in Appendix 1.*

### **3.12 Consumer Information**

Comprehensible Operating Instructions and Product Information in print form shall be enclosed with the product.

The energy consumption of the appliances greatly depends on the user behaviour. The product documentation shall at least include the gist of the following instructions for an energy-efficient, safe and gentle use of the microwave oven or combination microwave oven, respectively:

- Information on particularly energy-saving cooking methods, e.g. in the form of cooking time tables;

- Information on particularly gentle cooking with even heat distribution, e.g. in the form of cooking time tables;
- Instruction to keep the door seals clean for low radiation leakage.

Combination microwave ovens shall additionally meet the following criterion set forth in the Basic Award Criteria for “Electric Ovens for Household Use – RAL-UZ 143“:

- Information on the non-necessity of preheating the oven on the basis of a cooking and baking time table.
- If available: In convection/hot-air circulation mode meals can be simultaneously prepared on several levels.
- In order to use the residual heat during baking and roasting turn off the oven about 5 to 10 minutes before the end of the cooking or baking time.
- Instructions for proper and energy-saving use of the pyrolytic self-cleaning function, if available.

#### **Compliance Verification**

*The applicant shall declare compliance with requirement and submit the relevant pages of the product documentation.*

## **4 Applicants and Parties Involved**

**4.1** Manufacturer or distributors of products according to para. 2 shall be eligible for application.

**4.2** Parties involved in the award process are:

- RAL gGmbH to award the Blue Angel eco-label,
- the federal state being home to applicant’s production site,
- Umweltbundesamt (Federal Environmental Agency) which after the signing of the contract receives all data and documents submitted in application for the Blue Angel in order to be able to proceed with the development of the Basic Award Criteria.

## **5 Use of the Environmental Label**

**5.1** The terms governing the use of the Environmental Label by the applicant are stipulated by a Contract on the Use of the Environmental Label to be concluded with RAL gGmbH.

- 5.2** Within the scope of such contract the applicant undertakes to comply with the requirements under paragraph 3 while using the Environmental Label.
- 5.3** 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 December 31, 2018.
- They shall be extended by periods of one year each, unless terminated in writing by March 31, 2018 or March 31 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.
- 5.4** The applicant (manufacturer) shall be entitled to apply to RAL gGmbH for an extension of the right to use the label to the product entitled to the label if it is to be marketed under another brand/trade name and/or under other marketing organizations
- 5.5** The Contract on the Use of the Environmental Label shall specify:
- 5.5.1** Applicant (manufacturer/distributor)
  - 5.5.2** Brand / trade name, product designation
  - 5.5.3** Distributor (label user), i.e. the marketing organization according to paragraph 5.4

## **Appendix 1: Test Conditions for Formaldehyde Emissions according to para. 3.11**

### **1. Test Chamber:**

#### **1.1 Size and Condition**

Choose a test chamber in accordance with DIN EN 61591, yet without any further furniture or a comparable test chamber according to DIN EN ISO 16000-9 with a volume of 20 m<sup>3</sup>.

Stand-alone appliances are to be placed on the side of the wall opposite the door without making contact with the wall.

Built-in appliances are to be tested in a non or low-formaldehyde-emitting built-in furniture.

#### **1.2 Air Change**

There is no air change (air change rate is 0 h<sup>-1</sup>).

The air inside the standard kitchen is to be mixed by means of ventilators.

### **2. Measurement Method**

Measurement shall be performed in accordance with VDI Directive 3484, Sheet 1, or other equivalent methods (e.g. acetylacetone method, chromotropic acid method).

### **3. Measurement Location**

Measurement shall be made at a distance of 1.2 meters centrally on the operator's side of the appliance at a height of 1.2 meters.

### **4. Measurement Process**

#### **4.1 Blank Value Determination:**

The blank value in the test-chamber-air is to be determined and recorded in the measurement protocol before starting the measurement. It shall be measured after leaving the test chamber unventilated for one hour.

#### **4.2 Appliance Settings:**

**4.2.1** Appliances with conventional heating function (top/bottom heat): Heat the appliance to 250°C for 1 hour (temperature setting or highest temperature) using top and bottom heat.

**4.2.2** Appliances without conventional heating function but with forced-air function: Heat the appliance to 250°C for 1 hour (temperature setting or highest temperature) using the forced-air function.

**4.2.3** Appliances without conventional heating function and forced-air function but with a grill function: Heat the appliance for 1 hour at the highest temperature setting for grilling.

- 4.2.4 Microwave ovens without additional heating functions: The appliance shall be operated without load for 1 hour at 30% of the maximum microwave output power. If the appliance does not have this power level choose the power level with the least deviation from 30% of the maximum output power.
- 4.3 Perform the first measurement 30 minutes after switching on the appliance as a duplicate determination. Measuring time: 30 minutes.
- 4.4 Perform the second measurement after switching off the appliance (leave the appliance connected to the power supply) as a duplicate determination over a period of 30 minutes.
- 4.5 Mean Value Determination:  
Calculate the arithmetic mean from the four readings.
- 4.6 Repeat the measurement once, but not before the lapse of at least 12 hours.
- 4.7 Describe the odour and smoke production.

# CONTRACT

No.  
on the Award of the Environmental Label

RAL gGmbH as label awarding agency, and the firm of  
**(Distributor)**

as applicant, conclude the following Contract

on the Use of the Environmental Label

S P E C I M E N

1. Under the following conditions the applicant shall be entitled to use the Environmental Label for the labelling of the product / product group / project:  
**„Household Microwave Ovens“** for

**"Brand/Trade Name".**

This shall not include the right to use the Environmental Label as part of a brand.

Unless otherwise agreed, the Environmental Label shall only be used in the above given shape and colour. The entire inner surrounding text shall always be identical as regards size, form, thickness and colour of the letters and it shall be easy to read.

2. The Environmental Label according to para. 1 shall only be used for the above-mentioned product / product group / project.
3. If the Environmental Label is used for advertising purposes or other applicant activities the applicant shall make sure that it is exclusively used in connection with the above-named product / product group / project for which the use of the Environmental Label has been granted and settled under this contract. The applicant shall be solely responsible for the way the label is used, above all, in advertising.
4. During the entire period of label use the product / product group / project to be labelled shall comply with all requirements and conditions for the use of the label as specified in the "Grundlage für Umweltzeichen-Vergabe RAL-UZ 149" (Basic Criteria for Award of the Environmental Label RAL-UZ 149), as amended. This shall also apply to the reproduction of the Environmental Label (including the surrounding text). Claims for damages against RAL, especially on the grounds of third party objections to applicant's use of the label and the accompanying advertising shall be ruled out.
5. If the "Basic Criteria for Award of the Environmental Label" provide for checks by third parties the applicant shall bear the costs accruing in connection therewith.
6. Should the applicant himself or third parties find out that the applicant does not comply with the conditions

as stipulated in paras. 2-5 the applicant shall be liable to inform RAL gGmbH and stop the use of the Environmental Label until the conditions are complied with again. Should the applicant be incapable of restoring the state required for the use of the label immediately or should the applicant seriously offend against this contract RAL gGmbH may, if necessary, withdraw the Environmental Label and prohibit the applicant from using the label any longer. Claims for damages against RAL gGmbH because of the withdrawal of the label shall be ruled out.

7. The Contract on the Use of the Environmental Label may be terminated for good reason.

Examples of good reasons are:

- unpaid contributions
- substantiated risk of injury and death.

In such case, applicant's continued use of the Environmental Label shall be prohibited. The applicant shall not be entitled to bring a claim for damages against RAL gGmbH (see above: paragraph 6, sentence 3).

8. The applicant undertakes to pay RAL gGmbH an amount according to the "Entgeltordnung für das Umweltzeichen" (Schedule of Fees for the Environmental Label), as amended, for the period of use.

9. According to the Basic Criteria for Award of the Environmental Label RAL-UZ 149 this contract will run until December 31, **2018**. It shall be extended by periods of one year each, unless terminated in writing by **March 31, 2018** or by March 31 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 the products being still in the market.

10. Products / projects marked with the Environmental Label and the advertising for these products / projects may reach the consumer only when naming the company of the  
**(Applicant/Distributor).**

Sankt Augustin, this.... day of .....20...

Place, Date

RAL gGmbH  
Management

(Signature of authorized person  
and company stamp)