BLUE ANGEL

The German Ecolabel

Electric Hand Dryers

DE-UZ 87

Basic Award Criteria

Edition May 2014

Version 4

The Environmental Label is supported by the following four institutions:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

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.

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.

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
www.blauer-engel.de

Version 1 (05/2014): First Edition, Expiry date: December 31, 2016
Version 2 (01/2016): Prolongation without any change for 2 years, until 31.12.2018
Version 3 (01/2018): Prolongation without any change for 4 years, until 31.12.2022
Version 4 (04/2020): Changes in chapter 3.7 and appendix B

Table of contents

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 and Nuclear Safety, 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

In accordance with the German Safety At Work Regulation (ArbStättV), the use of communal towels in public administration, restaurants, hotels and factories has been prohibited for hygienic reasons since 1975. The following hand drying systems are available as an alternative: electric hand dryers, towel dispensers with sanitary paper (DE-UZ 5) or towel dispensers with fabric towel rolls (DE-UZ 77).

1.3 Objective of the environmental label

Climate protection, a reduction in energy consumption and the avoidance of pollutants and waste are key objectives of environmental protection.
The Blue Angel eco-label for electric hand dryers may be awarded to products featuring the following environmental properties:

- low energy consumption
- achievement of a high degree of dryness
- durable, safe and recyclable design
- avoidance of environmentally damaging materials.

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

1.4 Compliance with legal requirements

The observance of relevant existing laws and legal requirements is a prerequisite for those products awarded with the environmental label. In particular, the following legal requirements are observed:

- The EU directives 2012/19/EU[1] and 2011/65/EC[2] implemented in German law in the Electrical and Electronic Equipment Act (ElektroG)[3] that regulate disposal are observed. For precautionary reasons the product meets material requirements going beyond these provisions.
- The substance requirements defined by the EU Chemicals Regulation REACH (1907/2006/EC)[4] and Regulation EC No. 1272/2008[5] (or Directive 67/548/EEC) are observed.
- The Standby Directive[6] (801/2013) amending Regulation (EC) No. 1275/2008 with regard to ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment.
- Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (revised) (short: Machinery Directive).

2 Scope

These Basic Award Criteria are valid for electric hand dryers (e.g. hot air hand dryers, high speed hand dryers).

3 Requirements

3.1 On/off switch

The device shall have a contactless on/off switch that places the device into operation when a person's hands are placed in the intended position for the drying process. The power consumption in standby mode shall not exceed 0.5 W.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and submit the corresponding pages of the product documentation (Annex 2).

---

1 Directive on Waste from Electrical and Electronic Equipment, Directive 2012/19/EC of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment

2 Directive 2011/65/EC of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (revised version).

3 Law for the sale, return and environmental disposal of electrical and electronic equipment, BGBl, 2005, Part I, No. 17 (23 May 2005)

4 Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No. 793/93 and Commission Regulation (EC) No. 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

5 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, as well as amending Regulation (EC) No. 1907/2006

6 COMMISSION REGULATION (EU) No. 801/2013 of 22 August 2013 amending Regulation (EC) No. 1275/2008 with regard to ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment, and amending Regulation (EC) No. 642/2009 with regard to ecodesign requirements for televisions.

3.2 Drying

The hand dryer will when used in accordance with its proper use achieve a degree of dryness of 90 percent within a maximum of 30 seconds.
The time taken for drying shall be noted in the product documentation.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and submit a test report from a DIN EN ISO/IEC 17025 accredited testing laboratory in Annex 3, as well as the corresponding pages of the product documentation (Annex 2). Test reports completed by the applicant are recognised as being of an equivalent standard when the testing laboratory used for the measurements is accredited by an independent body as an SMT laboratory (supervised manufacturer testing laboratory). The degree of dryness is to be determined in accordance with the Annex "Determining the Degree of Dryness Achieved by Electric Hand Dryers.

3.3 Noise emissions

The evaluation of the noise emissions is based on sound power outputs in dB(A) rounded up to the nearest whole number. Electric hand dryers with the Blue Angel label must not exceed a sound power output of 85 dB(A) in their loudest operating state (highest blower speed, idle state).

The sound power level shall be indicated in the product documentation and sales documentation (brochures, manufacturer's website, etc.).

Compliance verification

The noise emissions shall be measured in accordance with DIN EN 60704-1. In accordance with Section No. 6.4.1 of DIN EN 60704-1, no operating person may be present during the measurements. As hand dryers are wall-mounted devices, the device must be mounted on a wall in accordance with Section No. 6.5.4 of DIN EN 60704-1. The required sound power level LC in dB(A) shall be determined in accordance with DIN EN 60704-3.
The applicant shall declare compliance with the requirement in Annex 1 to the Contract and submit a test report from a testing laboratory accredited in accordance with ISO 17025 (for the corresponding product group), as well as the corresponding pages of the product documentation (Annex 4). Test reports completed by the applicant are recognised as being of an equivalent standard when the testing laboratory used for the measurements is accredited by an independent body as an SMT laboratory (supervised manufacturer testing laboratory).

3.4 Energy efficiency

In achieving a degree of dryness of 90 percent (in accordance with Appendix A: "Determining the Degree of Dryness Achieved by Electric Hand Dryers"), the electric hand dryers may not exceed a power consumption of 12 Wh per drying process.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the Contract and submit a test report from a testing laboratory accredited according to ISO/IEC 17025 or an authorised SMT (Supervised Manufacturer Testing) laboratory (Annex 5), as well as the

corresponding pages of the product documentation (Annex 2). The measurement of the degree of dryness must be completed in accordance with Appendix A: "Determining the Degree of Dryness Achieved by Electric Hand Dryers". The power consumption of the hand dryer shall be entered in Annex 1.

3.5 Automatic switch-off and maximum drying time

Once the person's hands have been withdrawn, the hand dryer shall switch off after a maximum of 2 seconds. The maximum drying time after being switched on shall be limited to 60 seconds.

Compliance verification

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

3.6 Safety

The hand dryer carries the "Tested Safety" mark.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and submit a valid quality mark approval certificate (GS) (Annex 6).

3.7 Material requirements for plastics used in the housing and housing parts

The plastics may not contain as constituent parts[7] any substances classified as:

a) Substances which are identified as particularly alarming under the European Chemicals Regulation REACH (1906/2006/EC) and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "SVHC list of candidates").[8]
b) Substances that according to the CLP Regulation (EC) No. 1272/2008 have been classified in the following hazard categories or which meet the criteria for such classification[9]:
   - carcinogenic in categories Carc. 1A, Carc. 1B or Carc. 2
   - germ cell mutagenic in categories Muta. 1A, Muta. 1B
   - reprotoxic (teratogenic) in categories Repr. 1A, Repr. 1B

Halogenated polymers shall not be permitted. Neither may halogenated organic compounds be added as flame retardants. In addition, the use of flame-retardant materials that are rated as carcinogenic of category Carc. 2 or as acutely toxic to aquatic organisms with long-term effects.

---

[7] Constitutional components are substances which are added to the product as such or as constituents of mixtures and remain there unchanged in order to achieve or influence certain product properties. This does not apply to residual monomers that have been reduced to a minimum.

[8] 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/candiate-list-table

[9] The harmonized classifications and labellings of dangerous 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.

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

The following shall be exempt from this rule:

- process-related, technically unavoidable impurities
- fluoroorganic additives (e.g. anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed a proportion of 0.5 percent by mass
- plastic parts with a mass of less than 25 grams

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and submit a written declaration from the plastics manufacturer or guarantee the provision of these documents to RAL gGmbH. The declaration in Annex P-M confirms that the excluded substances have not been added to the plastics and provides a chemical description of the flame-retardant materials used including the CAS number and its rating.
The applicant shall state which plastics are used in the housing for parts with a mass $\leq$ 25 grams and provide a list of the plastics used in the housing according to Annex P-L25.

3.8 Guarantee

The applicant undertakes to offer a 5 year guarantee on the whole device as an option.
The product documentation shall contain information about the guarantee.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and submit the corresponding pages of the product documentation (Annex 2).

3.9 Repairability and provision of spare parts

The applicant undertakes to make sure that the provision of spare parts for the repair of the devices is guaranteed for at least 10 years following the termination 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. The product documentation shall include information about the above requirements, as well as the availability of spare parts.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and submit the corresponding pages of the product documentation (Annex 2).

3.10 Recyclable design

The appliance shall be designed and constructed in such a way that it possible to easily and quickly dismantle it for the purposes of repair and the separation of recyclable components and materials. This means:

- having suitable connections that can be removed using standard tools and these connecting joints shall be easily accessible
- instructions for dismantling the appliance shall be available for those handling old appliances – with the aim of recycling as many resources as possible

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and provide the relevant dismantling instructions for those handling old appliances (Annex 7).

3.11 Consumer information

The documentation included with the devices shall include both the technical specifications and the environmental and health-related consumer information. The following important user information must be included in the documentation and also be accessible via the manufacturer's website:

- A notice must be delivered with the device (e.g. in the form of a sticker or sign) that explains that it is important for hygienic reasons to fully dry your hands.
- Information on correct, hygienic cleaning of the device that takes into account the defined cleaning intervals incl. replacement of the filters (if present)
- Drying time for achieving a degree of dryness of 90 percent in accordance with Paragraph 3.2.
- Information on the sound power level of the device in dB(A) in accordance with Paragraph 3.3.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the Contract and submit the corresponding pages of the product documentation (Annex 2).

4 Applicants and Parties Involved

Manufacturers or distributors 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 December 31, 2022. They shall be extended by periods of one year each, unless terminated in writing by March 31, 2022 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.

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/distributor)
- Brand/trade name, product description
- Distributor (label user), i.e. the above-mentioned marketing organisations.

Appendix A Determining the Degree of Dryness Achieved by Electric Hand Dryers

The degree of dryness (see Paragraph 3.2 in the Basic Award Criteria "Electric Hand Dryers, DE-UZ 87“) is determined based on the NSF Protocol 335 (May 2007)[10] in accordance with the following instructions.

1 Framework conditions and preparation for the measurements

1. A group of three men and three women shall be chosen as test subjects.
2. The average hand width of the test group must not exceed the values stated in DIN 33402-2 "Ergonomics - Human body dimensions - Part 2: Values".
   - Hand width (width of the palm measured without the thumb, just underneath the base of the fingers):
     - Men: max. 95 mm
     - Women: max. 85 mm
   - Hand length (from the tip of the middle finger to the first wrist crease)
     - Men: max. 208 mm
     - Women: max. 196 mm
3. The test subjects are not permitted to wear any jewellery or accessories such as rings, watches, etc. on their fingers/hands.
4. The measurement of the degree of dryness must be carried out with a room temperature of 23.0°C ± 5°C and a humidity of 55.0 ± 5 %.
5. The measurement devices must have been exposed to the above named room conditions for at least 24 hours before the start of the measurements.
6. The wash basins in which the test subjects wet their hands for the drying process must contain water with a water temperature of min. 25°C and max. 30°C.
7. The reference paper towel for determining the residual dampness must have the following quality grade:
   - Pure pulp, chlorine-free bleached
   - 55.00 g/qm, (W) 220mm/400mm (L)

   e.g. Profix premium FaHa, Art. 080850 from TEMCA GmbH or equivalent.
8. It is recommended that a double layer of paper towels (up to approx. 10 grams) is used for the test process to guarantee the complete absorption of the moisture.
9. The weight of the paper towel (m_{dry}) must be measured on digital scales that are sensitive to at least a hundredth of a gram and then stated in the measurement report.
10. The test subject shall thoroughly wash their hands using a standard hand soap under warm water before the start of the first measurement.

[10] *NSF Protocol 335 - Hygienic Commercial Hand Dryers (NSF International)*

2 Completing the measurements

2.1 Reference measurement

2.1.1 Wetting the hands

1. The amount of water on the hands (m_{Water0}) is defined in each case as an average value for both the women and men.
   - Women: 3.5 grams
   - Men: 4.0 grams
2. The test subject submerges their hands up to the wrist creases for exactly 5.0 seconds in a wash basin (water temperature between 25°C and 30°C). The fingers should be constantly moved in the water during this process to remove air bubbles.
3. The hands are lifted out of the wash basin and then held above the basin without moving them and with the fingertips pointing straight downwards for a defined period of 10 seconds. The remaining residual water should correspond to the actual average value for the residual water of 3.5 grams for women and 4.0 grams for men with a deviation of maximum ± 1.0 gram per test subject.

2.1.2 Measurement

1. The amount of water on the hands (m_{Water0}) is defined in each case as an average value for both the women and men. (see Point 1, Paragraph 2.1.1).
2. The amount of water (m_{Water0}) for the relevant test subject is to be determined by measuring the difference in weight between the damp paper towel (m_{damp0}) and the dry paper towel (m_{dry}) and then stated in the measurement report as a standard value (m_{Water0}).

2.2 Measurement of the degree of dryness based on drying times

Wetting the hands

1. The hands are wet once again as described above (see Paragraph 2.1.1).
2. After removing their hands from the wash basin, the test subject allows the excess water to drip dry from their hands as described under Point 3 of Paragraph Appendix A2.1.1.
3. The subject's hands are then immediately placed in the correct position to operate the electric hand dryer.

2.3 Measurement

1. The subject's hands are then dried using the electric hand dryer for a set drying time (t_1) recommended by the manufacturer (max. 30 seconds).
2. Any movement of the hands (e.g. rubbing the hands together frequently) should be carried out in accordance with the instructions issued by the manufacturer.
3. The drying time (t_1) shall be stated in the measurement report.
4. After the drying time has expired, the remaining amount of water on the hands (m_{Water1}) is determined.
5. This involves the subject drying their hands – also between the fingers and on the wrist creases – with the dry and previously weighed paper towel as described under Point 0 of Paragraph 1, a drying time of 20 seconds may not be exceeded for this process. The weight of the damp paper towel (m_{damp1}) is then immediately calculated using digital scales that are sensitive to at least one hundredth of a gram.

6. The weight of the damp paper towel (m_{damp1}) and the selected drying time (t_1) shall be stated in the measurement report.
7. The remaining amount of water (m_{Water1}) is determined by calculating the difference in weight between the damp paper towel (m_{damp1}) and the dry paper towel (m_{dry}) and then stated as the weight (m_{Water1}) in the measurement report.

Calculating the degree of dryness

The degree of dryness ($\eta_{dryness}$) is calculated as follows and then stated in the measurement report:

$$\eta_{dryness} = 1 - (m_{Water1} / m_{Water0})$$

Repeating the measurements

1. The measurement process described in Paragraph 2.2 is then carried out again for a variety of different drying times (t_n) until a degree of dryness of exactly 90 % ± 1 % is achieved ($\eta_{dryness} = 0.9$)
2. The drying times (t_n), as well as the weights of the damp paper towels (m_{damp}), shall be stated in the measurement report in table form.
3. The calculation of the degree of dryness ($\eta_{dryness}$) is also to be stated in the measurement report in table form.
4. The measurements are to be repeated for all test subjects using a different measurement table ("Measurement of the degree of dryness based on drying times") for each individual test subject.

Calculation of the average degree of dryness

1. In order to calculate the average drying time required by the electric hand dryer to achieve a degree of dryness of 90 %, the arithmetic mean of the drying times from the test group (three men, three women) is determined.
2. In order to report the measurement to RAL gGmbH, the measurement values are recorded in a table that corresponds to the following template and declared by the applicant.

Test subject (name or designation)	**Amount of water for the reference measurement** (m_{Water0}) [grams]	**Drying time** (t) [seconds]	**Degree of dryness** ($\eta_{dryness}$) [-]
Test group of men			
Average value for men			
Test group of women			
Average value for women			
Average value for men and women			

Measurement report for degree of dryness

Framework conditions

Test subject
Name: _____
Sex: _____
Hand width: _____
Hand length: _____

Room temperature: _____

Humidity: _____

Water temperature: _____

Description of the paper towel[11]: _____

Weigh of the paper towel: m_{dry} = _____

Reference measurement

Weight of the damp paper towel: m_{damp0} = _____

Amount of water for the
reference measurement: $m_{Water0} = m_{damp0} - m_{dry}$ = _____

[11] Brand name, quality level, number of layers

Measurement of the degree of dryness based on drying times

Sequential number for the measurement	**Drying time** (t) [seconds]	**Weight of the damp paper towel** (m_{damp}) [grammes]	**Residual amount of water** ($m_{Water} = m_{damp} - m_{dry}$)	**Degree of dryness** ($\eta_{dryness} = 1 - (m_{Water} / m_{Water0})$ [-]

Appendix B Assignment of hazard categories and hazard statements

The following table assigns the hazard categories to the corresponding hazard statements (H Phrases).

Table 1: Hazard categories and H Statements

CLP Regulation (EC) No 1272/2008		
Hazard category	**Hazard Statements**	
	H Statement Codes	**Wording**
Carcinogenic Substances		
Carc. 1A Carc. 1B	H350	May cause cancer.
Carc. 1A Carc. 1B	H350i	May cause cancer by inhalation.
Carc. 2	H351	Suspected of causing cancer.
Substances classified for Germ Cell Mutagenicity		
Muta. 1A Muta. 1B	H340	May cause genetic defects.
Reprotoxic Substances		
Repr. 1A Repr. 1B	H360D	May damage the unborn child.
Repr. 1A Repr. 1B	H360F	May damage fertility.
Repr. 1A Repr. 1B	H360FD	May damage fertility. May damage the unborn child.
Repr. 1A Repr. 1B	H360Df	May damage the unborn child. Suspected of damaging fertility.
Repr. 1A Repr. 1B	H360Fd	May damage fertility. Suspected of damaging the unborn child.
Substances classified for Environmental Hazards		
Aquatic Chronic. 1	H410	Very toxic to aquatic life with long lasting effects.