

# Basic Criteria for Award of the Environmental Label

## Office Equipment with Printing Function (Printers, Copiers, Multifunction Devices)

**RAL-UZ 171**



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Table of Contents

1	Introduction.....	7
1.1	Introductory Comments.....	7
1.2	Background Information.....	7
1.3	Objectives of the Blue Angel Eco-Label.....	8
1.4	Definitions.....	10
1.4.1	Device Designs.....	10
1.4.2	Primary Functions.....	11
1.4.3	Printing and Printing Technologies.....	12
1.4.4	Device Parts.....	13
1.4.5	Operation Modes.....	15
1.4.6	Time-related Definitions.....	17
1.4.7	Shared Work Team Support.....	18
1.4.8	Power Consumption.....	19
2	Scope.....	20
3	Requirements and Compliance Verifications.....	21
3.1	General Requirements.....	21
3.1.1	Recyclable Design.....	21
3.1.2	Material Requirements.....	22
3.1.3	Marking of Plastics.....	24
3.1.4	Printing Paper.....	25
3.1.5	Duplex Printing and Copying.....	25
3.1.6	Photoconductor Drums.....	26
3.1.7	Guarantee of Repairs.....	27
3.1.8	Maintenance of Equipment.....	27
3.1.9	Product Take-Back.....	28
3.1.10	Packaging.....	28
3.2	Modules and Containers for Colourants.....	29
3.2.1	Recyclable Design and Reuse.....	29
3.2.2	Take-Back.....	29
3.2.3	Specific Instructions for Handling of Toner Modules.....	30
3.2.4	Material-related Requirements for Consumable Materials.....	30
3.3	Substance Emissions.....	33
3.3.1	Comments.....	33
3.3.2	Electrophotographic Devices.....	34

3.3.3	Ink(jet) Devices .....	37
3.3.4	User Information on Substance Emissions.....	39
3.3.5	Products of Identical Construction .....	39
3.4	Energy .....	40
3.4.1	Summary of Requirements .....	43
3.4.2	Maximum Values for Return Times $t_{2R}$ and $t_{3R}$ .....	45
3.4.3	Maximum Values for Activation Times.....	48
3.4.4	Maximum Values for Power Consumption at Monochrome Printing ( $TEC_M$ ) .....	50
3.4.5	Power Consumption in Sleep Mode .....	52
3.5	Noise Emissions .....	53
3.5.1	Noise Emissions (with Reference to Test Values).....	53
3.5.2	Noise Emissions (without Reference to Test Values).....	57
4	Product Documents and User Information .....	59
5	Outlook on Possible Future Requirements.....	61
6	Applicants and Parties Involved .....	62
7	Use of the Environmental Label .....	63

Appendixes to the Basic Award Criteria

Appendix D-V	Acoustics/Noise Emissions:	Test Pattern for Noise Tests During Colour Printing
Appendix B-M	Devices of Identical Construction	Definition and Scope of Testing
Appendix E-M1	Energy:	Interpretation Aid for Return Times, Calculation Examples for the Typical Energy Consumption [TEC] and Guidelines for the Classification of Idle Modes
Appendix E-M2	Energy:	Measuring and Measurement Reports
Appendix E-I	Energy:	User Information
Appendix R-L1	Recyclable Design:	Checklist "Recyclable Design of Office Equipment with Printing Function" (to be attached to the application as Annex 3a)
Appendix R-L2	Material-related Requirements for Consumable Materials/ Material Requirements for Plastics of Casings:	List of Relevant Substances which Meet the Criteria for Classification as PBT and SVHC Substances (as well as a list of those substances which had been added to the so-called "list of candidates" according to REACH Article 59, para. 1 at the point in time when the Basic Award Criteria were published)
Appendix S-M	Substance Emissions:	Test Method for the Determination of Emissions from Hardcopy Devices

Forms and Checklists to be Completed and Attached to the Application

Annex 0	Checklist and Declarations by the Applicant	
Annex 1	Declaration by the Manufacturer	
Annex 2	Declaration by the Distributor	
Annex 3a	Recyclable Design:	Checklist (= filled-out Appendix R-L1 to the Basic Award Criteria)
Annex 3b	Recyclable Design:	Filled-out Form of the Joint Position Guidance on Implementing Article 11 of Directive 2002/96/EC (WEEE), Annex A
Annex 4	Plastics used in Cases:	Declaration by the Manufacturer
Annex 5	Plastic Materials:	Declaration by the Plastic Manufacturer
Annex 6a	Toners/Inks:	Declaration by the Manufacturer
Annex 6b	Toners/Inks:	Material Safety Data Sheets (MSDS)
Annex 6c	Toners:	Ames-Test (unless the test results declared in the MSDS are negative)
Annex 7a	Substance Emissions:	Results of the Emission Testing
Annex 7b	Substance Emissions:	Test Report
Annex 8a	Energy/Acoustics:	Results of the Energy Measurements, of the Determined Page Throughputs and of the Sound Power Level Determination according to 3.5.2
Annex 8b	Energy:	Test Protocol for Measuring Power Consumption and Return Times according to Appendix E-M2
Annex 8c	Energy:	Test Protocol for Measuring and Determination of the Typical Energy Consumption (TEC) for Monochrome Printing according to Appendix E-M2. This shall at least comprise the ENERGY STAR "TEC Data Collection

Worksheet".

Annex 9	Acoustics/Noise Emissions:	Results of the Sound Power Level Determination according to 3.5.1
Annex 10	Acoustics/Noise Emissions:	Accreditation Certificate of the Test Laboratory which had conducted the measurements
Annex 11	Reuse and Recycling of Devices:	Declaration by the Distributor
Annex 12	User Information:	Information and Data Sheet
Annex 12a	User Information:	Excerpts from Product Documentations (if required)
Annex 13	Declaration by the Manufacturer on Identical Construction	Declaration by the Manufacturer

## **1 Introduction**

### **1.1 Introductory Comments**

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 the RAL the Environmental Label Jury has set up these Basic Criteria for Award of the Environmental Label. The RAL is in charge of awarding the Environmental Label.

Upon application to the RAL and on the basis of a Contract on the Use of the Environmental Label to be concluded with the RAL, the permission to use the Environmental Label may be granted for all products, provided that they comply with the requirements as specified hereinafter.

### **1.2 Background Information**

ICT equipment has become indispensable to companies and private households. In households, computers, office equipment with printing function and telephones make up the biggest share of the total ICT-related electric power consumption – with almost 60% or 30 TWh, respectively. In contrast, these devices only account for around 12% of the total ICT-related electric power consumption in companies, which was around 6.8 TWh in the year 2007.

Blue Angel eco-labelled office equipment with printing function (printers, copiers, multifunction devices) consume considerably less electric power than devices on the market do on average. The use of devices with relatively low consumption of electric power and low so-called no-load losses (losses caused by holding devices ready for use while not actually using them) contributes considerably to climate protection.

Nowadays, electrophotographic devices (LED and laser) and ink(jet) printers are dominating the market. For some time, it has been known that electrophotographic devices release fine and ultrafine particles into the indoor air just like other household appliances or everyday activities, e.g. vacuuming. The emissions of electrophotographic devices as well as potential health risks which might be posed by such ultrafine particles (UFPs) have been subject of public discussions. Among other things, this also applies to electrophotographic desktop devices which are frequently

found in private households and home offices as well as at companies' and public authorities' workplaces.

For such devices, the Indoor Air Hygiene Commission (IRK) of the German Federal Environmental Agency (UBA) recommends a test value for measurements in emission test chambers of  $3.5 \times 10^{11}$  particles per 10 minutes of printing. This test value was defined by the Indoor Air Hygiene Commission (IRK) based on general hygienic considerations and represents a precautionary value. Therefore, and given the different chemical composition of particles emitted from electrophotographic printing devices the IRK abandoned toxicological single case considerations and, instead, places the test value in a general hygienic context of exposure at the workplace and in private households. This means, that when defining this value, observed amounts of particles released from current electrophotographic printing devices and during operation processes, the typical substances contained in these particles, and their size ranges were taken into account.

Moreover, Blue Angel eco-labelled office equipment with printing function meet stringent requirements for recyclable design and material selection, thus, providing good frame conditions for efficient recovery of materials used and helping to save natural resources.

Last but not least, low-pollutant materials are used in plastic parts of Blue Angel eco-labelled devices, thus, reducing possible harm to the environment and risks for human health.

### **1.3 Objectives of the Blue Angel Eco-Label**

Climate protection, reduction of energy consumption, minimisation of no-load losses, increased resource efficiency and avoidance of pollutants and waste are key objectives of environmental protection.

Office equipment with printing function can be awarded the Blue Angel eco-label when featuring the following environmental properties:

- Low consumption of electric power
- Long-life and recyclable design
- Avoidance of materials harmful for the environment
- Low indoor air pollution and noise emissions at the workplace and in the home



environment.

Furthermore, it is ensured that the following legal requirements are met:

- The disposal-regulating EU Directives 2002/96/EC<sup>1</sup>, 2002/95/EC<sup>2</sup> and 2011/65/EU<sup>3</sup> as transposed into German law following the Electrical and Electronic Equipment Act (Elektro- and Elektronikgesetz; ElektroG)<sup>4</sup> and the planned Regulation for the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (ElektroStoffV)<sup>5</sup> are followed. Material requirements additionally established for precautionary reasons are met or exceeded.
- The EU Directive 2006/66/EC<sup>6</sup> as transposed into German law following the Batteries Act (Batteriegelgesetz; BattG)<sup>7</sup> is followed.
- The substance-defining EU Chemicals Regulation REACH (1907/2006/EC)<sup>8</sup> and the EC Regulation No. 1272/2008<sup>9</sup> (or Directive 67/548/EEC) as transposed into German law by the Ordinance on Hazardous Substances (Gefahrenstoffverordnung; GefStoffV)<sup>10</sup> are taken into account.

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<sup>1</sup> Directive on Waste from Electrical and Electronic Equipment (WEEE), Directive 2002/96/EC of the European Parliament and of the Council, dated 27 January 2003

<sup>2</sup> Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, Directive 2002/95/EC, Official Journal No L 37, 13 February 2003

<sup>3</sup> Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, Directive 2011/65/EU of the European Parliament and the Council, Official Journal No L174,88, 01 July 2011

<sup>4</sup> Act on the placing on the market, return and environmentally sound disposal of waste electrical and electronic equipment, Federal Law Gazette 2005, Part I, No.17 (23 May 2005)

<sup>5</sup> Draft of the Regulation for the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (ElektroStoffV; status 04 April 2012)

<sup>6</sup> Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on Batteries and Accumulators and Waste Batteries and Accumulators, OJ L 339, p. 39, 2007, No. L 139, p. 40

<sup>7</sup> Batteries Act (Batteriegelgesetz), Federal Law Gazette I, page 1582, from 25 June 2009

<sup>8</sup> 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

<sup>9</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

<sup>10</sup> Ordinance on Hazardous Substances (GefStoffV), Federal Law Gazette I, page 1643

## 1.4 Definitions

When using these Basic Award Criteria, the following definitions are to be applied.

The following definitions are in best possible accordance with the definitions as provided by the ENERGY STAR version 1.1<sup>11</sup>. However, some definitions are completely new or were modified to match the Blue Angel approach.

### 1.4.1 Device Designs

Note: an arrow (↑) preceding a term points out that this term is defined in chapter 1.4.

#### 1.4.1.1 Base Unit

This is the most basic version of a device that is actually sold as a fully operational model. The base unit can be designed and shipped as a single piece or as a combination of functionally integrated components.

#### 1.4.1.2 Ink(jet) Device

This is a device which transfers data onto paper or similar materials by using inks, gels or solid inks (waxes).

#### 1.4.1.3 Monochrome Printing Device

This is a device which can transfer data onto paper or similar materials by ↑ monochrome printing only.

#### 1.4.1.4 Colour Printing Device

This is a device which can transfer data onto paper or similar materials by ↑ colour printing.

#### 1.4.1.5 Multifunction Device

(according to the ENERGY STAR version 1.1<sup>11</sup> for “Multifunction Device“; here, however, restricted to devices with a printing unit) A commercial product with printing unit which is either a single piece or a combination of functionally integrated

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<sup>11</sup> “Energy Star Program Requirements for Imaging Equipment Table of Contents – Version 1.1“; please see: Commission Decision of 20 April 2009 determining the Community position for a decision of the management entities under the Agreement between the Government of the United States of America and the European Community on the coordination of labelling programmes for energy-efficient office equipment on the revision of the imaging equipment specifications in Annex C, part VII, to the Agreement (2009/347/EC)

components. So-called single-sheet “convenience copying” (as offered, for example, by devices whose primary function is faxing) is not considered as copying in terms of these Basic Award Criteria. Supplement: the product must be capable of performing at least two primary functions one of which must, at least, be printing or copying.

#### **1.4.1.6 Upgrades**

The term stands for all changes that lead to an increase in the number of ↑ primary functions of the ↑ base unit performed by the device. This primarily includes changes in the device technology and its control; be it by changing the existing technology/control or by installing new technology/control; be it inside or outside the device. Examples: exchange of existing components of the device; enabling certain functions by installing certain components (including chips) or installation of appropriate control software.

#### **1.4.1.7 Upgrade Levels**

Levels of equipment of a ↑ base unit with the extensions described under ↑ upgrades.

#### **1.4.1.8 Delivery Status**

The condition in which the manufacturer ships the device and in which the manufacturer has set the ↑ activation times of individual operating modes.

### **1.4.2 Primary Functions**

#### **1.4.2.1 Primary Functions**

Primary functions are ↑ printing, ↑ copying, ↑ digitising and transmission of data as well as ↑ sending and receiving of electronic messages and faxes.

#### **1.4.2.2 Copying**

Data input via a scanning unit and data output by printing on paper or similar materials. The number of printouts of a document must be selectable.

#### **1.4.2.3 Printing**

Output of data received by the device via interface on paper or similar materials.

#### **1.4.2.4 Digitising and Transmission of Data**

Digitising of data via a scanning unit and transmission of data via interface.

#### **1.4.2.5 Sending and Receiving of Electronic Messages and Faxes**

Sending and receiving of electronic messages and faxes via internal modem.

### **1.4.3 Printing and Printing Technologies**

#### **1.4.3.1 Page Throughput $S_M$**

The page throughput  $S_M$  specifies the number of DIN A4 size pages a device can print per minute in monochrome printing mode by transfer of data onto paper or similar materials. Page throughput  $S_M$  has to be determined according to ISO/IEC 24734 and specified as an average ESAT value resulting from simplex printing<sup>12</sup> in office operation. In case the device offers the primary function “printing”, the page throughput has to be determined according to the ISO/IEC 24734 standard. If not, testing for devices with ADF must be conducted in accordance with ISO/IEC 24735 and for devices without ADF in accordance with ISO/IEC 29183.

For devices with  $\uparrow$  page printing the test pattern according to ISO/IEC 10561 (the so-called Dr.-Grauert-Brief) can be used as well. Alternatively, the so-called continuous printing can be applied with such devices.

The value for the page throughput is to be rounded to whole numbers according to the method described in ENERGY STAR version 1.1.

#### **1.4.3.2 Page Throughput $S_F$**

By analogy with the  $\uparrow$  page throughput  $S_M$ , the page throughput  $S_F$  specifies the number of DIN A4 size pages a device can print in colour by transfer of data onto paper or similar materials. As with the page throughput  $S_M$ , the page throughput  $S_F$  has to be determined according to ISO/IEC 24734 or ISO/IEC 24735 or ISO/IEC 29183, respectively.

For devices with  $\uparrow$  page printing the test pattern according to ISO/IEC 10561 (the so-called Dr.-Grauert-Brief) can be used as well. Alternatively, the so-called continuous printing can be applied with such devices.

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<sup>12</sup> Definition according to the English version of the standard: “office category”, “simplex printing”, “average ESAT”

#### **1.4.3.3 Printing Unit**

Unit of the device used to print on paper and similar data carriers – be it in the primary function ↑ copying, ↑ printing or printing of faxes.

#### **1.4.3.4 Page Printing**

This means transferring the data of an entire page onto paper or similar materials in a continuous printing pass. ↑ Colour printing may require separate passes for particular colours for printing one page (serial colour printing).

#### **1.4.3.5 Line Printing**

This means transferring the data onto paper or similar materials in many consecutive discrete swaths.

#### **1.4.3.6 Monochrome Printing**

This is a printing process in which data are transferred onto paper or similar materials making them appear monochrome. This can be done by using monochrome colourants or by mixing different colourants.

#### **1.4.3.7 Black Colourant Printing**

This is a type of ↑ monochrome printing in which black colourant is used only. There is no mixing of different colourants (mixed black printing).

#### **1.4.3.8 Colour Printing**

This is a printing process in which data are transferred onto paper or similar materials exclusively using coloured colourants or by using a combination of coloured and black colourants.

### **1.4.4 Device Parts**

#### **1.4.4.1 Scanning Unit**

Unit of the device used to optically scan paper documents and similar data carriers in order to convert them into electronic data that can be stored, edited, converted or transmitted – primarily with the aim of using them for data processing in a device (copier or multifunction device) or in a computer (mainly corresponds to the ENERGY STAR version 1.1<sup>11</sup> definition of the function of “scanners”).

#### **1.4.4.2 Telephone Modem**

Unit of the device which can convert data received or sent via telephone line.

#### **1.4.4.3 Accessory**

(largely in accordance with the ENERGY STAR version 1.1<sup>11</sup> definition of “accessory”) A supplemental component that is not necessary for standard operation of the ↑ base unit, but that can be added before or after shipment in order to add new functionality or alter functions of the device. An accessory can be sold separately under its own model number, or sold with a base unit as part of a multifunction device package or configuration.

Note: a) Examples of accessories include sorters, high-capacity paper feeders, paper-finishing equipments, large paper supply equipments, multiple output paper trays as well as chips and counters. b) The power consumption of accessories is not included in the power consumption of the device which the distributor must state in Annex 12.

#### **1.4.4.4 Controller**

This ↑ accessory expands the functionalities of the image creating device, e.g. by processing data sent to the office equipment with printing function in order to deliver particularly high printing quality. The controller is supplied with electric power by the office equipment with printing function or by an own power supply. Please refer to the ENERGY STAR version 1.1<sup>11</sup> definition of printing devices under “Digital Front-end (DFE)”.

#### **1.4.4.5 Colourant**

Mixture in which dyes, pigments and further additives are dissolved or dispersed in a carrier material such as a polymer matrix (e.g. toners), liquids (e.g. inks), gels or waxes (e.g. solid inks).

#### **1.4.4.6 Module for Colourant<sup>13</sup>**

A complex module (of a printer, copier or a fax) which in addition to a container for colourants can include other components for transferring the colourant onto the media (e.g. toner module with toner container, photo semiconductor, charging unit,

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<sup>13</sup> Also described as all-in-one print cartridge according to DIN 33870-1 and E DIN 33871-1

cleaning unit and excess toner reservoir or ink(jet) print head with nozzles and one or more integrated ink tanks).

#### 1.4.4.7 Container for Colourant

Containers for colourants such as toners (e.g. toner bottles), inks (e.g. ink tanks) etc.

### 1.4.5 **Operation Modes**

Overview of the main operation modes:

Standard Operation Modes	Idle Modes $Z_i$		
Print Mode, Copy Mode, etc.	Ready Mode $Z_a$	Electric Power Saving Mode(s) $Z_b, Z_c, \text{ etc.}$	Plug-in Off Mode <sup>14</sup>

#### 1.4.5.1 Standard Operation Mode

(in accordance with the definition of ENERGY STAR version 1.1<sup>11</sup> for “active“ mode in which, however, the term “main function” is not defined) In standard operation mode the product is connected to the mains and actively performs a  $\uparrow$  primary function.

Note: an example for standard operation mode is the  $\uparrow$  print mode.

#### 1.4.5.2 Print Mode

In print mode the device puts out data by printing on paper and similar materials – be it in the primary function  $\uparrow$  copying,  $\uparrow$  printing or when faxing.

#### 1.4.5.3 Idle Mode

( $Z_a, Z_b, \text{ etc.}$ ): the state that the product enters after the  $\uparrow$  end of the printing process – immediately or upon expiry of an  $\uparrow$  activation time ( $t_{aA}, t_{bA}, \dots$ ). The idle modes also include the  $\uparrow$  plug-in off mode which is either user-activated by a switch or self-initiated by the device. In an idle mode, the  $\uparrow$  power consumption ( $P_a, P_b, \dots P_s$ ) of the device is usually lower than in the print mode. Idle modes are stand-by modes in which the device is more or less ready for operation i.e. it can more or less fast re-

<sup>14</sup> Provided that this mode is not self-initiated by the device itself but only by user intervention (e.g. by using a switch)

turn to print mode. ↑ Ready mode and electric power saving modes are examples for idle modes. With respect to the Blue Angel requirements the idle modes are to be categorised according to Appendix E-M1, i.e. they must be delimited from each other.

Note: the idle modes include, for example, the modes “sleep” and “stand-by” as described by ENERGY STAR version 1.1<sup>11</sup>.

#### **1.4.5.4 Ready Mode**

(in accordance with the ENERGY STAR version 1.1<sup>11</sup> definition of “ready” mode, here, however, limited to ↑ print mode) This is the idle mode  $Z_a$  in which the product is not producing output, has reached operating conditions, has not yet entered an ↑ electric power saving mode and is ready to return to print mode with minimum delay. All device functions can be activated in this mode and the device must be capable of returning to print mode by responding to the use of input options of the device. Input options include external electrical impulses (as, for example, data network impulses, fax input or remote control) and direct technical user interventions (e.g. from using a switch or button).

Note: ready mode is the state that the device enters immediately after the ↑ end of the printing process.

#### **1.4.5.5 Electric Power Saving Mode**

This is an idle mode ( $Z_b$ ,  $Z_c$ , ...) which the device enters after expiry of an ↑ activation time ( $t_{bA}$ ,  $t_{cA}$ , ...) and in which its ↑ power consumption ( $P_b$ ,  $P_c$ , ...) is usually lower than in ready mode.

Note: after the end of the printing process devices usually enter ready mode first before they enter an electric power saving mode. Some devices have just one electric power saving mode while others have multiple electric power saving modes of different power consumption levels. And again others have no electric power saving mode at all. These devices stay in ready mode in which power consumption is mostly very low so that this ready mode fulfils the function of an electric power saving mode.

#### **1.4.5.6 Sleep Mode**

Sleep mode: this is the mode of reduced power consumption the device enters automatically after a period of inactivity – with the times given in table 3.4 marking the



latest possible times. All product features can be activated in this mode. Also, the device must be able to switch to a primary function by responding to any given input option which the device features; this, however, can go along with a certain delay. These input options include external electrical impulses (e.g. network impulses, fax calls or remote control) and direct physical interventions (e.g. using a switch or button). For office devices only capable of performing the primary function ↑ copying the ↑ plug-in off mode can be identical to the sleep mode; this does not apply to other devices.

#### **1.4.5.7 Plug-in Off Mode**

(in accordance with ENERGY STAR version 1.1<sup>11</sup> definition of the “off” mode) This is the power state that the product enters when it has been manually or automatically switched off but is still connected to the mains. This mode is ended by an impulse, for example via a switch or a timer which brings the unit into ↑ ready mode. If this state is manually activated by the user, it is often referred to as “manual off”, and if it is activated by an automatic or predetermined signal (e.g. activation time or timer), it is often referred to as “auto off”.

### **1.4.6 Time-related Definitions**

#### **1.4.6.1 End of the Printing Process**

Point in time when during a print job the last printed sheet of paper (or of similar material) of the print job has left the ↑ printing unit of the device so that it is available to the user. This is the case, for example, when the sheet has reached the output tray of the device. If there are different points in time which could be used for determination of the end of the printing process for a certain device – for example, if the device has various output trays – the earliest of these points in time is to be considered as the end of the printing process in terms of these Basic Award Criteria.

#### **1.4.6.2 Activation Times ( $t_{aA}$ , $t_{bA}$ , etc.)**

The activation time is the time that elapses after the end of the ↑ printing process until the device enters an ↑ idle mode.

Note: with respect to the ↑ delivery status this corresponds to the ENERGY STAR version 1.1<sup>11</sup> definition of “default delay time”.

### **1.4.6.3 Return Time ( $t_{iR}$ )**

This is the amount of time it takes to return from an  $\uparrow$  electric power saving mode to  $\uparrow$  ready mode. The return time is to be determined as difference between

- a) the time required to complete a certain print job from electric power saving mode  $Z_i$  (i.e.  $Z_a$  or  $Z_b$  or ...) and
- b) the time it takes to complete the same job from ready mode  $Z_a$ .

(by analogy with the ENERGY STAR 3'2005 definition of "recovery time from sleep"<sup>15</sup>)

## **1.4.7 Shared Work Team Support**

### **1.4.7.1 Shared Work Team Support**

The features and capabilities enabling a device to be used together with other devices by a shared work team. Specifically, the device must have the following three attributes:

- $\uparrow$  Embedded page description language
- $\uparrow$  Shared work team paper handling
- $\uparrow$  Remote management by a network administrator

### **1.4.7.2 Embedded Page Description Language (PDL)**

This is the ability of a device to render a page description language (PDL) as for example PostScript or PCL at the print speed as set out in ISO/IEC 24734.

### **1.4.7.3 Shared Work Team Paper Handling**

These are features which support paper handling in shared work teams. The device must have at least three of the following attributes:

- 500-sheet or higher input paper tray capacity,
- multiple paper cassettes (for paper feeding),
- paper tray for DIN B4 envelopes (for paper feeding),
- 100-sheet or higher output paper tray capacity,

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<sup>15</sup> "Energy Star Qualified Imaging Equipment – Revised Terminology and Definitions", 16 March 2005

- automatic double-sided printing.

#### 1.4.7.4 Remote Management by a Network Administrator<sup>16</sup>

The ability to be remotely managed by a network administrator, which includes remote management functions such as user access controls, job accounting, device configuration, and firmware updates via network access<sup>17</sup>.

### 1.4.8 **Power Consumption**

#### 1.4.8.1 Power Consumption of the Device

Basis for evaluating a device's power consumption in the ↑ idle modes, i.e. in ready mode ( $P_a$ ), in the electric power saving modes ( $P_b$ ,  $P_c$  and so on) as well in ↑ plug-in off mode ( $P_s$ ) is its total power consumption. This is the effective power consumption measured at the power supply of the device. The power consumption of ↑ accessories does not have to be included into the power consumption declaration required by the distributor in Annex 12. The respective information in Appendix E-M2 have to be followed.

#### 1.4.8.2 Typical Energy Consumption for Monochrome Printing ( $TEC_M$ )

This is the power consumption for an assumedly typical usage cycle of a device in kilowatt-hours per week (kWh/week). The  $TEC_M$  is largely determined according to the ENERGY STAR method by using a single-colour monochrome test pattern. Modifications and further details are set out in Appendix E-M2.

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<sup>16</sup> German: remote management by a network administrator = Fernsteuerbarkeit durch Netzwerk-Administrator

<sup>17</sup> German: firmware updates = Erneuerungen von Geräteprogrammen

## 2 Scope

These Basic Award Criteria apply to office devices (usually referred to as printers, copiers and/or multifunction devices) which

- at least offer printing or copying as their primary function,
- at least are capable of producing monochrome or colour printouts on standard paper with a grammage of 60 to 80 g/m<sup>2</sup>,
- are capable of processing media of up to a maximum format of DIN A3+,
- work as electrophotographic devices (LED or laser technology) by using toners or as ink(jet) devices by using inks (or gels, or waxes) and
- have noise emissions (as declared A-weighted sound power levels) that do not exceed 75 dB during ↑ printing or copying.

The requirements of the Basic Award Criteria for the modules and containers for colourants as well as for the colourants themselves apply to the unmodified original equipment of the products marked with the environmental label of the respective distributor, including the materials recommended in the product documents by the distributor.

### **3 Requirements and Compliance Verifications**

#### **3.1 General Requirements**

##### **3.1.1 Recyclable Design**

Office equipment bearing the Blue Angel must be easily recyclable. The Checklist “Recyclable Design of Equipment“ (Appendix R-L1 to the Basic Award Criteria) identifies characteristics that are prerequisites for good recyclability.

These characteristics include among others:

##### Structural Design and Joining Techniques

The following applies to office equipment with printing function:

- Avoidance of permanent joints (e.g. glued or welded) between different materials, unless technically required
- Use of easily detachable mechanical joints
- Easy disassembly which can be carried out by hand or by machine

##### Material Selection

Casing parts: in order to limit the variety of materials used plastic casing parts with a mass greater than 25 grams have to consist of one single polymer or a polymer blend. The plastic casings may consist of up to four separable polymers or polymer blends.

Large-sized casing parts must be designed in a way that the contained plastics can be used for the production of high-quality durable products by applying available recycling techniques. The use of coatings for special parts is to be reduced to a minimum. If applied, an appropriate reason for this use is to be given.

Galvanic coatings are not permissible.

The use of recycled plastics which meet the material requirements according to 3.1.2 is permissible and preferred.

### Recycling of Devices at End of Life

Components and materials according to Appendix III of the Electrical and Electronic Equipment Act (ElektroG) must be easily identifiable and removable (e.g. printing modules, lamps for background lighting of liquid crystal displays (LCDs) containing mercury, liquid crystal displays).

The distributor must hold information on disassembly of the devices in recycling or treatment plants available.

The distributor must inform the RAL on the intended way of recycling of parts and waste management (recycling and disposal) of devices.

#### **Compliance Verification:**

*The manufacturer must complete the Checklist “Recyclable Design“ (Annex 3a, i.e. filled-out Appendix R-L1 to the Basic Award Criteria). The requirements are met if all category M questions have been answered “Yes”.*

*The manufacturer must name the casing plastics used for parts with a mass greater than 25 grams and submit a list of plastics (according to Annex 4). This must include information on the range of recycled materials in plastics as permitted by the manufacturer.*

*The distributor must indicate the envisaged measures for reuse and recycling of the equipment in Annex 11.*

*The distributor must declare in Annex 2 that the contracted recycling company will be provided with the information required for professional disassembly within one year after having supplied the devices to the market by attaching the filled-out form of the Joint Position Guidance on implementing article 11 of Directive 2002/96/EC (WEEE), Annex A, as Annex 3b. Annex A is attached to the Appendix R-L1.*

## **3.1.2 Material Requirements**

### **3.1.2.1 Material Requirements for Plastics of Casings, Casing Parts**

Halogenated polymers and additions of halogenated organic compounds as flame retardants are not permissible.

Exempted from this rule are:

- Fluoroorganic additives (as, for example, anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed 0.5% by weight
- Fluoroplastics as, for example, PTFE
- Plastic parts with a mass equal to or less than 25 grams. However, they must not contain PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenyl ethers) or chlorinated paraffins. (This exemption does not apply to control panel keys.)
- Special plastic parts located close to heating and fuser elements. They must not, however, contain PBBs, PBDEs or chlorinated paraffins.
- Large-sized plastic parts which are reused as can be proved and which are marked according to para. 3.1.3. They must not, however, contain PBBs, PBDEs or chlorinated paraffins.

Flame retardants used in plastic parts with a mass greater than 25 grams are to be confidentially reported to the RAL and identified by their CAS number.

In addition, no substances are to be intentionally added as constituents to the plastics which are classified as:

- carcinogenic according to Category 1A or 1B of table 3.1 in Appendix VI of Regulation 1272/2008/EC<sup>18</sup>
- mutagenic according to Category 1A or 1B of table 3.1 in Appendix VI of Regulation 1272/2008/EC
- toxic to reproduction according to Category 1A or 1B of table 3.1 in Appendix VI of Regulation 1272/2008/EC
- persistent, bio-accumulative and toxic (PBTs) or very persistent or very bio-accumulative (vPvBs) according to the criteria in Appendix XIII of the REACH Regulation<sup>19</sup>

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<sup>18</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 harmonised classification and labeling – tables, table 3.1: the list of harmonised classification and labeling of hazardous substances from Annex I to Directive 67/548/EEC, in brief: GHS Regulation, in its effective version

<sup>19</sup> List of the relevant substances meeting the criteria for classification as PBT and vPvB substances (status: 24 December 2010), please see Appendix R-L2

- or giving cause for particular concern for other reasons and added to the so-called “list of candidates”<sup>20</sup> according to REACH Article 59, para. 1.

Exempted are process-related technically unavoidable impurities and additions below 0.1% by weight of the respective plastic materials.

**Compliance Verification:**

*The manufacturer must declare compliance with the requirements in Annex 1. With regard to flame retardants the manufacturer must prompt the plastic suppliers to send a written declaration to the RAL stating that the banned substances have not been added to the casing plastics (Annex 5). This also applies to the plastics used which are made of recycled material. In addition, the manufacturer commits to prompt the suppliers of casing plastics to confidentially report the chemical designation of the flame retardants used (CAS no.) to the RAL (also Annex 5).*

**3.1.2.2 Material Requirements for the Plastics Used in Printed Circuit Boards**

The base material of printed circuit boards must not contain PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenyl ethers) or chlorinated paraffins.

**Compliance Verification:**

*The manufacturer must declare compliance with the requirement in Annex 1 or submit declarations by the suppliers of printed circuit boards stating that the banned substances are not contained in the boards.*

**3.1.3 Marking of Plastics**

Plastic parts with a mass greater than 25 grams and a plane surface of at least 200 square millimetres, must be permanently marked according to ISO 11469:2000 while taking ISO 1043, parts 1–4, into consideration.

Exempted are plastic parts contained in reused complex modules.

**Compliance Verification:**

*The manufacturer must declare compliance with the requirement in Annex 3a.*

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<sup>20</sup> Status at the date of publication of the Basic Award Criteria



### 3.1.4 Printing Paper

The devices must be capable of using recycled paper made of 100% post-consumer recycled paper that meets the requirements of EN 12281. The distributor is free to recommend certain types of recycled paper.

The user information must include the following note: “This equipment is suitable for using recycled paper“. A reference to EN 12281 can be included.

***Compliance Verification:***

*The distributor must submit the corresponding product and information data sheet (Annex 12; see also para. 4).*

### 3.1.5 Duplex Printing and Copying

Office equipment with printing function (as defined in para. 2) must offer an option for duplex printing on DIN A4 paper (see table 1).

**Table 1:**

**Requirements for Automatic Duplex Printing and Copying<sup>21</sup>**

Page Throughput $S_M$ <sup>[22]</sup> [DIN A4 Pages Per Minute]		Minimum Requirements for Duplex Printing and Copying
Colour Printing Devices	Monochrome Printing Devices	
≤19	≤24	The devices must offer a manual (copiers) or an additional software-supported (printers, multifunction devices) option for duplex printing and copying.
>19–39	>24–44	The devices must be equipped with a component for duplex printing and copying by default or such a component must be offered as supplementary equipment.
>39	>44	The devices must be equipped with a component for duplex printing and copying by default.

The user information to be provided by the distributor must include information on options for duplex printing, the existence of a duplex unit or its availability as an upgrade.

**Compliance Verification:**

*The distributor must declare compliance with the requirement in Annex 2 and must submit the relevant product and information data sheet (Annex 12; see also para. 4).*

**3.1.6 Photoconductor Drums**

Photoconductor drums must not contain selenium, lead, mercury or cadmium or any of their compounds as intentionally added constituents.

Spent photoconductor drums are to be taken back by the distributor (free of charge return to the return facility) and either be recovered for reuse or subjected to materi-

<sup>21</sup> See Energy Star Program Requirements for Imaging Equipment; version 1.1, para. 3 or current version

<sup>22</sup> See definitions under para. 1.4.3.1

al recycling. The user information must include details regarding the take-back and return facility. Such facility must be located in Germany or, respectively, in the country where the product is offered with reference to the Blue Angel.

**Compliance Verification:**

*The manufacturer must declare in Annex 1 that the aforementioned substances are not contained in the photoconductor drums and the distributor must declare in Annex 2 that exchanged drums will be taken back and recycled. The distributor must indicate the recycling method (Annex 11 or 12) and refer to take-back options in the product and information data sheet (Annex 12; see also para. 4).*

*Material Safety Data Sheets must be submitted to the RAL upon request.*

### 3.1.7 Guarantee of Repairs

The distributor commits to ensure that spare parts supply and necessary infrastructure for equipment repair is secured for a period of at least 5 years after the end of production and that users are informed about the guaranteed availability of spare parts.

Parts to be replaced (spare parts) are those parts which usually have the potential to fail during the typical use of the product. In contrast, those parts whose life cycle usually exceeds the usual life of the product do not have to be held available as spare parts.

**Compliance Verification:**

*The distributor must demonstrate compliance with the requirement by presenting the product and information data sheet (Annex 12; see also para. 4).*

### 3.1.8 Maintenance of Equipment

Maintenance has great influence on the environmental features of a device. That is why maintenance should only be performed by qualified persons. The user information must include instructions for equipment cleaning and maintenance, provided that such measures are necessary. Users must be informed about a possibly required replacement of an ozone or dust filter.

**Compliance Verification:**

*The distributor must inform in the product and information data sheet about type and extent of required maintenance work and its performance by qualified persons (Annex 12; see also para. 4).*

**3.1.9 Product Take-Back**

The distributor commits to fully comply with the requirements of the Electrical and Electronic Equipment Act (ElektroG).

The return facilities named by the distributor must be located in Germany or in the country where the product is offered with reference to the Blue Angel. The product documents must include details on the equipment return options.

**Compliance Verification:**

*The distributor must declare compliance with the requirement in Annex 2 and demonstrate compliance by submitting the product and information data sheet (Annex 12; see also para. 4).*

**3.1.10 Packaging**

Plastics used for product packaging must not contain halogen-containing polymers. The plastics used must be marked in accordance with the German Packaging Ordinance (Verpackungsverordnung), as amended.

**Compliance Verification:**

*The distributor must declare compliance with the requirement in Annex 2.*

## 3.2 Modules and Containers for Colourants

### 3.2.1 Recyclable Design and Reuse

Modules and containers for colourants, such as toners, inks, gels, waxes and the like supplied by the distributor along with the original equipment, as well as those recommended in the product documents for use in the respective device, must be so designed as to ensure they can be channelled to reuse or material recycling. They must meet the relevant requirements as specified in the Checklist “Recyclable Design” (Appendix R-L1 to the Basic Award Criteria). Reuse is always be given preference over recycling. That is why no parts specially designed to prevent the re-use of modules for colourants are to be attached to the modules.

If devices are originally equipped with modules for colourants whose colourant content is atypically low users have to be explicitly informed about it.

#### **Compliance Verification:**

*The manufacturer must declare compliance with the requirement by completing the relevant sections of the Checklist “Recyclable Design” (Appendix R-L1 to the Basic Award Criteria) and answers “YES” to all the “M” requirements.*

*The distributor must inform the RAL by Annex 11 about projected reuse or recycling methods.*

*If applicable, he must additionally give details in the product and information data sheet on an atypically low capacity of toner or ink modules supplied along with the equipment (Annex 12; see also para. 4).*

### 3.2.2 Take-Back

The distributor commits to take back modules and containers for colourants which he supplied or recommended for use in the product documents in order to preferably channel such modules and containers to reuse or material recycling. This also applies to excess toner reservoirs. A third party (dealers or service agencies or companies engaged in the module reuse/recycling business) may be commissioned to perform this task. The formers are to be provided with instructions for proper handling of excess toners.

Non-recyclable product parts must be properly disposed of.

Modules and containers are to be taken back free of charge by the return facility named by the distributor to which products can be returned personally or by shipment (return facilities abroad are only permissible if the products can be sent there free of charge). The product documents must include detailed information on the return options.

**Compliance Verification:**

*The distributor must demonstrate compliance with the requirement in the product and information data sheet (Annex 12; see also para. 4). The distributor must declare compliance in Annex 2 and document instructions to the recycling contractor for handling of excess toners (e.g. by means of the EC Material Safety Data Sheet) and by means of the note: "Prevent toner dust from being released into the air." (Annex 6b).*

### **3.2.3 Specific Instructions for Handling of Toner Modules**

Toner modules and containers must be sealed so as to prevent toners from escaping during storage and transport. The user information must include explicit instructions for proper handling of toner modules. In addition, the user information must include a note warning the user that toner modules must not be forced open and that in case toners have escaped as a result of improper handling inhaling toner dust and skin contact are to be avoided as precaution. Additionally, it must be stated what to do in case of skin contact and it has to be stressed that toner modules must be kept away from children.

**Compliance Verification:**

*The distributor must submit the product and information data sheet (Annex 12; see also para. 4).*

### **3.2.4 Material-related Requirements for Consumable Materials**

#### **3.2.4.1 Hazardous Substances**

Colourants such as toners, inks, solid inks and the like must not contain substances as intentionally added constituents which are classified as

- a) carcinogenic according to categories 1A, 1B or 2 of table 3.1 in Appendix VI of Regulation 1272/2008/EC
- b) mutagenic according to categories 1A, 1B or 2 of table 3.1 in Appendix VI of Regulation 1272/2008/EC
- c) toxic to reproduction according to categories 1A, 1B or 2 of table 3.1 in Appendix VI of Regulation 1272/2008/EC
- d) persistent, bio-accumulative and toxic (PBTs) or very persistent or very bio-accumulative (vPvBs) according to the criteria in Appendix XIII of the REACH Regulation<sup>23</sup>
- e) or giving cause for particular concern for other reasons and added to the so-called "list of candidates"<sup>24</sup> according to REACH article 59, para. 1

In addition, colourants must not contain substances as intentionally added constituents which require labelling of the mixture according to table 3.1 or 3.2 of Annex VI of said EU Regulation with the following R or H phrases or which meet the requirements for such classification:

H 370 (R 39/23/24/25/26/27/28) Causes damage to organs

H 371 (R 68/20/21/22) May cause damage to organs

H 372 (R 48/25/24/23) Causes damage to organs through prolonged or repeated exposure

H 373 (R 48/20/21/22) May cause damage to organs through prolonged or repeated exposure

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<sup>23</sup> List of the relevant substances meeting the criteria for classification as PBT and vPvB substances (status: 24 December 2010), please see Appendix R-L2

<sup>24</sup> Status at the date of publication of the Basic Award Criteria

**Compliance Verification:**

*The applicant must demonstrate compliance with the requirement by submitting a declaration by the device manufacturer or the ink or toner manufacturer (Annex 6a). Material Safety Data Sheets for all colourants are to be submitted upon filing of the application (Annex 6b). Provided that the Material Safety Data Sheets for toners do not show a negative AMES Test the test result of such a test must be given separately (Annex 6c).*

**3.2.4.2 Heavy Metals**

No substances are to be added to toners and inks which contain mercury, cadmium, lead, nickel or chromium-VI-compounds as intentionally added constituents. Exempted are high molecular weight complex nickel compounds as colourants.

Production-related contamination by heavy metals, such as cobalt and nickel oxides is to be kept as low as technically possible and economically reasonable (ALARA principle = as low as reasonably achievable).

**Compliance Verification:**

*The applicant must demonstrate compliance with the requirement by submitting a declaration by the device manufacturer or the ink or toner manufacturer (Annex 6a).*

**3.2.4.3 Azo Dyes**

Azo dyes (dyestuffs or colour pigments) that can release carcinogenic aromatic amines appearing on the list of aromatic amines in Regulation (EC) 1907/2006 (REACH Regulation), Annex XVII, Appendix 8<sup>25</sup> (see also TRGS 614)<sup>26</sup> must not be used in toners and inks.

**Compliance Verification:**

*The applicant must demonstrate compliance with the requirement by submitting a declaration by the device manufacturer or the ink or toner manufacturer (Annex 6a).*

**3.2.4.4 Biocides in Inks**

Only those substances may be added as active biocides to inks which are listed as so-called existing substances in Annex II to Commission Regulation EC 2032/2003

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<sup>25</sup> According to the amending Regulation (EC) No. 552/2009 of 22 June 2009

<sup>26</sup> [http://www.baua.de/de/Themen-von-A-Z/Gefahrstoffe/TRGS/TRGS-614\\_content.html;jsessionid=DE8FE0F226164F3E52F56C99F814AA6E.2\\_cid135](http://www.baua.de/de/Themen-von-A-Z/Gefahrstoffe/TRGS/TRGS-614_content.html;jsessionid=DE8FE0F226164F3E52F56C99F814AA6E.2_cid135)



amended by Commission Regulation EC 1048/2005<sup>27</sup>. The use of new (non-listed) active substances requires approval according to the Biocidal Products Act (Biozidgesetz)<sup>28</sup>.

**Compliance Verification:**

*The applicant must demonstrate compliance with the requirement by submitting a declaration by the device manufacturer or the ink or toner manufacturer (Annex 6a).*

### **3.3 Substance Emissions**

#### **3.3.1 Comments**

Also, electronic devices emit volatile organic substances into the indoor air, with the amount of these substances being time-dependent. Temperature rise due to use of the device – e.g. during the printing process – intensifies the release (emission) of such substances. In addition, ozone can be generated during the operation of printing devices depending on the technology used. Furthermore, electrophotographic devices release fine and ultrafine particles. These emissions shall be kept as low as possible in order to maintain good indoor air quality. This is supported by both the limitation of emissions within the scope of the requirements for the Blue Angel eco-label and appropriate user behaviour.

Volatile organic compounds, VOCs, are determined as the sum parameter TVOCs (total volatile organic compounds). Benzene, styrene as well as ozone are determined as single substances. Dust is measured gravimetrically. In addition, particle emissions are quantified during the printing process as particle number concentrations.

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<sup>27</sup> Commission Regulation (EC) No. 2032/2003 of 4 November 2003 on the second phase of the 10-year work programme referred to in Article 16, (2) of Directive 98/8/EC of the European Parliament and of the Council concerning the placing of biocidal products on the market and on the amendment of Regulation (EC) No. 1896/2000, Official Journal of the European Union L 307/1 of 24 November 2003, amended by the Commission Regulation (EC) No. 1048/2005 of 13 June 2005, Official Journal of the European Union L 178/1 of 9 July 2005

<sup>28</sup> The Biocidal Products Directive 98/8/EC governs the placing of biocidal active substances and biocidal products on the market. As from 1 September 2006, only the existing biocidal active substances may be used which appear on the “final list of existing biocidal active substances” in Annex II to Commission Regulation (EC) No. 2032/2003 amended by Commission Regulation (EC) 1048/2005. The 10-year review programme is running until 13 May 2010. Thereafter, the respective biocidal products will require approval according to the German Biocidal Products Act.

The emissions are measured under defined conditions and specified as emission rates. Determination of emission rates according to Appendix S-M to the Basic Award Criteria is done in pre-operating phase<sup>29</sup> of the device as well as during continuous printing.

Maximum permissible emission rates were defined under the presumption of a use factor of 0.1 for monochrome printing equipment in print mode, i.e. printing is actually only done during 10% of the time theoretically available for uninterrupted printing (this corresponds to a print volume of about 1,000 pages per working day for a device that prints approximately 17 pages/minute). For colour printing equipment, a use factor of 0.05, i.e. half of the above value, is assumed, for the time being.

The use factor for the pre-operating phase is 1. The equipment-related emission of newly produced devices will, however, decrease with the passing of time. It is lower for desktop devices – primarily because of the lower material and component volume.

The maximum permissible emission rates for pre-operating and print phase in table 2 consider, from a precautionary perspective, the influence of ready and print phase on indoor air quality on a proportionate basis.

### **3.3.2 Electrophotographic Devices**

Electrophotographic devices are tested for emissions of volatile organic compounds in a pre-operating phase prior to the beginning of the printing process. During the printing process, they are tested for release of TVOCs, benzene, styrene as well as for release of ozone, dust (gravimetrically) and particles (number concentration). The particle number concentration is measured continuously in the size range between 7 and 300 nm. Extension of the measuring range to particle diameters between 5 to 1,000 nm is possible – depending on the measurement equipment used. Minimum requirements to be met by the measurement equipment as well as its appropriate particle size measuring range are defined in Appendix S-M<sup>30</sup>. The predominant number of particles emitted by electrophotographic devices lies within this particle size range.

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<sup>29</sup> This pre-operating phase comprises the pre-set time profile of the device's power consumption for one hour

<sup>30</sup> As the predominant number of emitted particles has a diameter smaller than 300 nm, differences in the measuring range of the measurement equipment are negligible.

The emission rates in pre-operating and in print phase are to be determined and recorded according to the test methods described in Appendix S-M to the RAL-UZ 171 Basic Award Criteria. They must not exceed the values shown in table 2:

**Table 2:**

**Permissible Test Values for Emission Rates as Determined According to Appendix S-M for Electrophotographic Devices**

(All Values in mg/h, Except for Particle Emissions)		Monochrome Printing	Colour Printing
Pre-operating Phase	TVOC*	1 (Desktop Devices) 2 (Floor-mounted Devices, Device Volume >250 l)	1 (Desktop Devices) 2 (Floor-mounted Devices, Device Volume >250 l)
Print Phase (= Pre-operating + Print Phase)	TVOC*	10	18
	Benzene	<0.05	<0.05
	Styrene	1.0	1.8
	Unidentified Single Substances VOC	0.9	0.9
	Ozone	1.5	3.0
	Dust	4.0	4.0
Print Phase	PER <sub>10 PW</sub> [Particles/10 min]	3.5 * 10 <sup>11</sup>	3.5 * 10 <sup>11</sup>

\* Please see the list of volatile organic compounds which must be considered when measuring emissions from office equipment with printing function (please see Appendix S-M, para. 4.5 VOCs).

Provided that the emission rate determined also meets the test values for monochrome printing when printing out the colour test pattern no additional testing of colour devices is required for monochrome printing.

The test report must list the types of toner used with the device for testing. Any change of type of toner must be notified to the RAL and will require a resubmission of a test report.

The test report must always contain month and year of device manufacture.

#### Particle Emissions in the Fine and Ultrafine Particle Size Range

For colour devices, particle emissions are determined in colour mode; for monochrome devices, in monochrome mode.

$$\text{PER}_{10} = n.m * 10^x \text{ [particles/10 min]}$$

For printing devices with a **device volume  $\leq 250$  l** the following test value has to be met:

$$\text{PER}_{10 \text{ PW}} = 3.5 * 10^{11} \text{ [particles/10 min]}$$

For printing devices with a **device volume  $> 250$  l** (base unit as specified by the manufacturer) the particle emissions value **PER<sub>10</sub>** has to be declared in the test report.

According to Appendix B-M “Devices of Identical Construction”, devices can have device volumes below and above 250 l depending on their configuration. Device configurations with a volume  $\leq 250$  l and awarded the environmental label must meet the above mentioned test value. Testing of particle emissions is possible for all configurations of identical construction. The test chamber size must in each case comply with the criterion for the loading factor according to Appendix S-M, para. 4.2.

If the particle emissions of a base unit which is to be tested are “not quantifiable” according to Appendix S-M, para. 4.9.3, evaluation step 9, and if its volume does not exceed 250 l, then it is considered as meeting the test value. In this case, testing of particle emissions must be repeated in a single proof with a volume-reduced configuration of the particular device of identical construction according to Appendix S-M, para. 4.9.

#### **Compliance Verification:**

*The manufacturer must submit a form completed by the test laboratory (Annex 7a) confirming compliance with the requirements of the Basic Award Criteria regarding the substance emissions for monochrome printing with monochrome printing equip-*

*ment as well as for colour printing and, if the occasion arises, for monochrome printing with colour printing equipment.*

*A copy of the complete test report according to the test guideline (Appendix S-M) must be enclosed (Annex 7b). The qualification of the test laboratory for the emission measurements under paras. 3.3.2 and 3.3.3 is, for the time being, to be established to the satisfaction of the German Federal Institute for Materials Research and Testing (Bundesanstalt für Materialforschung und -prüfung) Working Group IV and documented in an annex to the test report.*

### **3.3.3 Ink(jet) Devices**

TVOCs are to be determined for ink(jet) devices on the basis of the work instructions in Appendix S-M when printing out the colour test pattern. Testing is to be performed at the print speed referred to by the manufacturer as normal or standard mode and which is usually factory preset. The emission rates during the print phase are to be determined and recorded according to the test method described in Appendix S-M to the RAL-UZ 171 Basic Award Criteria. They must not exceed the values shown in table 3:

**Table 3:**

**Permissible Test Values for Emission Rates Determined According to Appendix S-M for Ink(jet) Devices**

(All Values in mg/h)		Monochrome Printing	Colour Printing
Pre-operating Phase	TVOC*	1 (Desktop Devices) 2 (Floor-mounted Devices, Device Volume >250 l)	1 (Desktop Devices) 2 (Floor-mounted Devices, Device Volume >250 l)
Print Phase (= Pre-operating + Print Phase)	TVOC*	10	18
	Benzene	<0.05	<0.05
	Styrene	1.0	1.8
	Unidentified Single Substances VOC	0.9	0.9

\* Please see the list of volatile organic compounds which must be considered when measuring emissions from office equipment with printing function (please see Appendix S-M, para. 4.5 VOCs).

Provided that the emission rate determined also meets the test value for monochrome printing when printing out the colour test pattern no additional testing of colour equipment is required for monochrome printing.

The test report must list the types of ink used for testing. Any change of a type of ink must be notified to the RAL and will require a resubmission of a test report.

**Compliance Verification:**

*The manufacturer must submit a form completed by the test laboratory (Annex 7a) confirming compliance with the requirements of the RAL-UZ 171 Basic Award Criteria regarding the substance emissions. A copy of the complete test report according to the test guideline (Appendix S-M) must be enclosed as well (Annex 7b).*

*The qualification of the test laboratory for the emission measurements under paras. 3.3.2 and 3.3.3 is, for the time being, to be established to the satisfaction of the German Federal Institute for Materials Research and Testing (Bundesanstalt für Ma-*

terialforschung und -prüfung) Working Group IV and documented in an annex to the test report.

#### **3.3.4 User Information on Substance Emissions**

The distributor must inform in the user information that testing was carried out according to the requirements of the Blue Angel eco-label award criteria by using the consumables (types of toners or inks) supplied and recommended by the manufacturer and that those requirements were met.

The distributor must further state that new electronic devices generally emit volatile substances into the indoor air and that, therefore, the user should ensure more frequent air exchange in rooms where new equipment is set up or directly at the workplace, especially during the first days of use.

***Compliance Verification:***

*The distributor must submit the product and information data sheet (Annex 12; see also para. 4).*

#### **3.3.5 Products of Identical Construction**

If two devices of identical construction differ in their maximum print speed at monochrome printing the product printing at highest speed is to be tested.

The result is considered as transferable to those devices of identical construction whose print speed falls short of the maximum print speed by not more than 20 percent.

When filing application for three or more devices of identical construction with different print speeds the product printing at highest print speed and another one featuring a lower print speed is to be tested.

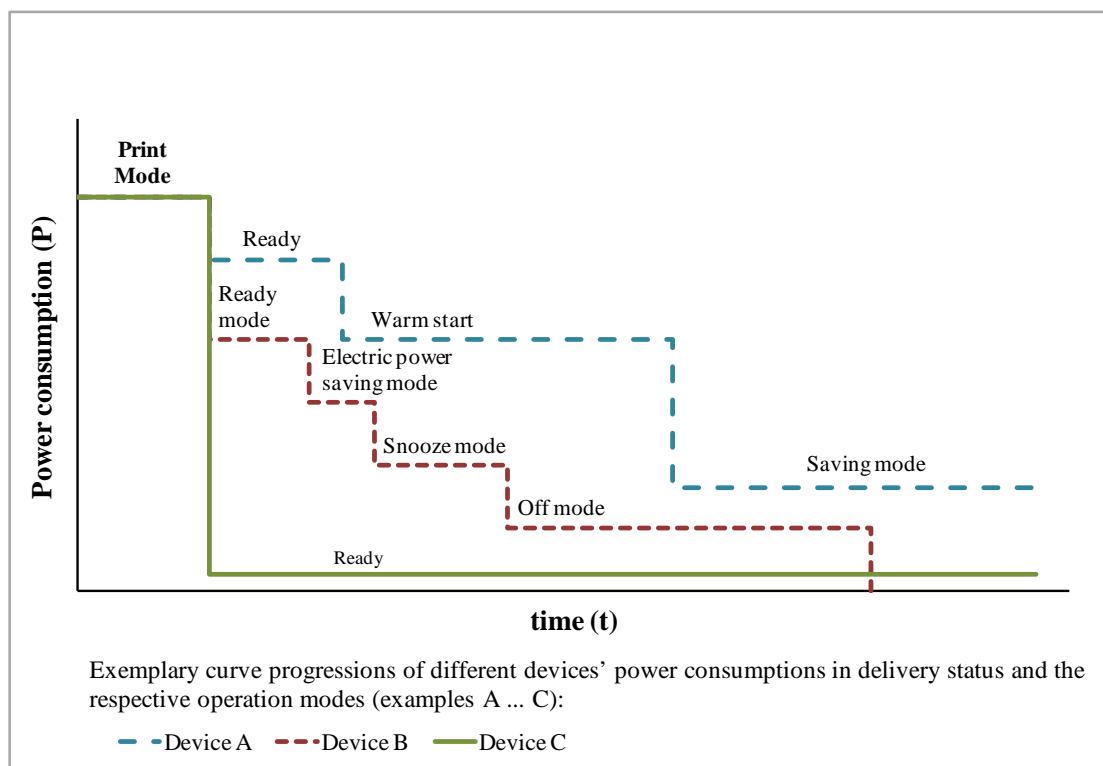
Further comments on devices of identical construction can be found in Appendix B-M to the Basic Award Criteria.

### 3.4 Energy

After the end of the printing process office equipment with printing function usually enter  $\uparrow$  ready mode. Being in this mode, devices can immediately start to print, if required.

**Figure 1:**

**Exemplary Curve Progressions of Different Devices' Power Consumptions During the Time that Elapses After the End of the Printing Process**



*Note: In figure 1, the ready mode is indicated as "ready" or as "ready mode".*

After having entered the  $\uparrow$  ready mode, the devices usually go to a reduced power-consumption mode, a so-called  $\uparrow$  electric power saving mode, for example to the modes "warm start", "saving mode", and so on (see figure 1). The power consumption in such electric power saving modes can be measured at a laboratory (unit: watts). To what extent these modes will contribute to a reduction in electric power consumption in everyday office life (unit: kilowatt-hours) depends on whether they actually occur and, if so, for how long (unit: hours; hence: watts \* hours = kilowatt-hours). For many devices the user can change the  $\uparrow$  activation times of the electric



power saving modes – that means they also can choose a very high value – or even deactivate the modes. If, however, a device needs such a long  $\uparrow$  return time that the user might regard this as burdensome he might try to choose as high a value as possible for the activation time of the electric power saving mode to prevent this mode from occurring too quickly and, thus, too frequently. Or the user will even deactivate this mode. As a result, the device will remain in a higher power consumption mode. To avoid this, it is necessary to make the user accept electric power saving modes and their consequences in everyday office life. That is why the Blue Angel sets low maximum values for return times (see para. 3.4.2). Apart from this, the user information must include corresponding comments.

In earlier versions, the Blue Angel had featured maximum values for power consumption in the different  $\uparrow$  idle modes for office equipment with printing function. From 2003/2004, the Blue Angel followed the approach to no longer refer to individual modes but establish a limit curve showing the progression of power consumption over the time that elapses after the  $\uparrow$  end of the printing process. With the June version which came into force in 2006, the new requirement to state power consumption values according to the ENERGY STAR test procedure in the user information – regardless of the printing technology used – was introduced. With this change, users were given the chance to compare power consumption levels of devices regardless of the respective printing technology applied.

The ENERGY STAR only requires maximum values for the typical energy consumption (TEC<sup>[31]</sup> in kilowatt-hours per week) for electrophotographic and certain ink(jet) devices. For other ink(jet) devices the ENERGY STAR requires maximum values for power consumption in specific operation modes (OM<sup>[32]</sup>).

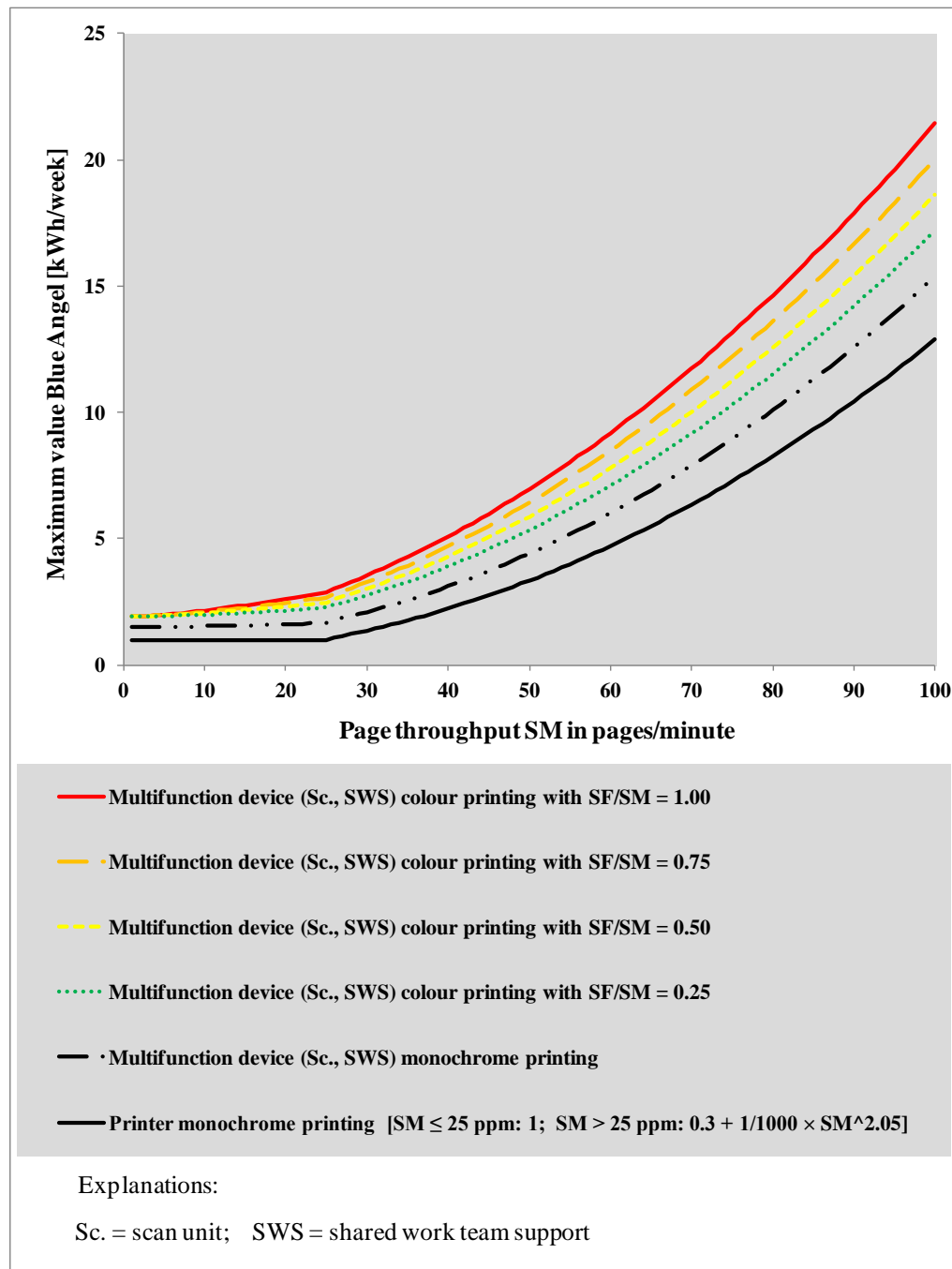
This current version of the Basic Award Criteria aims for defining a consistent and thus comparable evaluation of printing devices – regardless of the printing technology applied. All devices must meet a maximum value for typical energy consumption which is calculated on basis of the same consistent approach.

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<sup>31</sup> German: TEC = Typischer Stromverbrauch (TSV)

<sup>32</sup> German: OM = Betriebszustand

**Figure 2:**  
**Exemplary Maximum Values Curve Progressions for Typical Energy Consumptions**



Measurements of power consumption, typical energy consumption (TEC), activation and return times are to be conducted in accordance with Appendix E-M2 and have to be consistent with the statements made in Appendix E-M1.

### 3.4.1 Summary of Requirements

**3.4.1.1** The ↑ return time, is the time it takes a device to return from an electric power saving mode to a ready mode. The return time must not exceed the value as set out in para. 3.4.2.

**3.4.1.2** The ↑ typical power consumption at monochrome printing of a device must not exceed the value as set out in para. 3.4.4.

**3.4.1.3** For the idle modes the distributor must state in the user information (Annex 12):

- a) Activation times
- b) Return times
- c) Power consumption

These three points describe the device's (electric power saving) behaviour in delivery status. Details on how to define the different ↑ idle modes are given in Appendix E-M1.

In any case, the device must meet the requirements for electric power saving behaviour – see the before mentioned points a) and b):

- This applies as soon as the device has completed any ↑ primary function – not only ↑ copying or ↑ printing – and does not perform any other primary function.
- This also applies if the device is connected to a data network. Signals received via the data network which do not serve the performance of a ↑ primary function<sup>33</sup>, must neither “wake up” the device, i.e.
  - neither allow the device to enter a higher power consumption mode, e.g. ↑ ready mode,
  - nor keep it from switching according to the ↑ activation times set.

For devices featuring ↑ shared work team support the following exemption applies: For the time required for remote management processes<sup>34</sup> by a network administrator – see para. 1.4.7.4 – the device is allowed to enter a higher power consumption mode; however, it is not allowed to enter ↑ ready mode.

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<sup>33</sup> For example server requests regarding the status

<sup>34</sup> The status requests stated under footnote 33 are not to be regarded as “remote management by a network administrator”.

- This also applies if the office equipment with printing function is connected to a ↑ controller offered or licensed by the distributor. For all controllers offered or licensed by the distributor for use with one of his devices, he has to ensure that they do not affect the electric power saving functions of the device when connected.
- This also applies if accessories are connected.

The statements “must meet the requirements for electric power saving behaviour – see the before mentioned points a) and b)” and “do not affect the electric power saving functions of the device” have the meaning that the values for a) activation times and b) return times must not be increased. With this, extending of times which shorten electric power saving intervals shall be excluded. For example, extension of the activation time to infinite by deactivation of the idle modes shall be excluded.

- 3.4.1.4** In ↑ sleep mode, the device must meet the maximum value for power consumption as set out in para. 3.4.5.
- 3.4.1.5** A switch for switching at least to ↑ plug-in off mode must be mounted in an easily accessible position at the device when placed in a usual setup position. Easy accessibility must also be ensured if the device is upgraded – for example, with accessories. In ↑ plug-in off mode, the device’s power consumption must not exceed 0.5 watts. It must be so designed as to ensure that it can be switched to this mode at least twice a day over the normal life cycle without suffering damage.
- 3.4.1.6** Design of the symbols on switches and buttons must comply with the relevant criteria according to the standard IEEE 1621<sup>35</sup>. Compliance with this requirement can be abandoned for models which were first put on the market before 1 January 2013.
- 3.4.1.7** In ↑ delivery status the device must be set in a way that it meets all requirements described in para. 3.4.
- 3.4.1.8** Measurements are to be conducted in accordance with the requirements as set out in Appendix E-M2. This Appendix refers to measurement methods as defined by ENERGY STAR version 1.1, except for para. 4 of Appendix E-M2. In addition, the specifications set out in para. 2 of Appendix E-M2 are to be considered.
- 3.4.1.9** For the purpose of comparison, the manufacturer reports (regarding line printers) – in addition to the values of  $S_M$  and, if applicable, of  $S_F$  – the values of the highest

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<sup>35</sup> <http://www.beuth.de/de/norm/ieee-1621/83179743>

possible page throughput (determined in accordance with the up-to-now common practice).

### 3.4.2 Maximum Values for Return Times $t_{2R}$ and $t_{3R}$

Office equipment with printing function according to para. 1.4 must not exceed the values for returning to  $\uparrow$  ready mode as stated in table 3.2. Here, the following has to be considered:

- The  $\uparrow$  idle mode  $Z_i$  ( $Z_b$  or  $Z_c$  or ...) for which the return time is to be determined:
  - This is the  $\uparrow$  idle mode  $Z_i$  in which the device is after a certain time  $t_{iB}$  (the time which had elapsed after end of the printing process). For the return time  $t_{2R}$  this is  $t_{2B}$  and for the return time  $t_{3R}$  this is  $t_{3B}$ . For both  $t_{iB}$  times the values are stated in table 3.3.

*Example: In figure 3, for  $t_{2R}$  of device A (upper dotted line) the warm start mode is the idle mode to be considered.*

- For the determination of the idle mode in which the device is at the time  $t_{iB}$ , the activation times  $t_{iA}$  of the primary function (stated in table 3.1) are to be used.
- If right at the time  $t_{iB}$  the device switches between two  $\uparrow$  idle modes it must meet the maximum value of the return time of that  $\uparrow$  idle mode to which the device switches.

*Example: In figure 3, for  $t_{2R}$  of device B (middle dotted line) the off mode is to be considered.*

- However, if at the time  $t_{iB}$  the device is in the ready mode  $Z_a$ , the following is to be considered: according to para. 1.4.6.3 the return time is the time the device needs to return from an electric power saving mode to ready mode. As the device, in the case described, is already in ready mode the requirement for the return time is dropped.

*Example: In figure 3, for  $t_{2R}$  and  $t_{3R}$  of device C (lower dotted line) this applies to the ready mode.*

- Appendix E-M1, para. 1 has to be considered as well.
- The time required to complete a certain print job from the idle mode  $Z_i$  ( $Z_b$  or  $Z_c$  or ...) (indent a) under para. 1.4.6.3): the return time is not measured but results

from the difference between two times; see details under para. 1.4.6.3. With regard to the determination of the before mentioned time the following is to be considered:

- The device must have switched from the primary function – which is stated in table 3.1 – to the considered idle mode  $Z_i$ .
- During the determination, the device must return to the primary function which is stated in table 3.1. Thus, the return to the  $\uparrow$  ready mode of the primary function stated in table 3.1 is being determined.
- The time required to complete the same print job from the ready mode ( $Z_a$ ) (indent b) under para. 1.4.6.3). With regard to this determination the following is to be considered:
  - The primary function stated in table 3.1 is to be used.

**Table 3.1:**

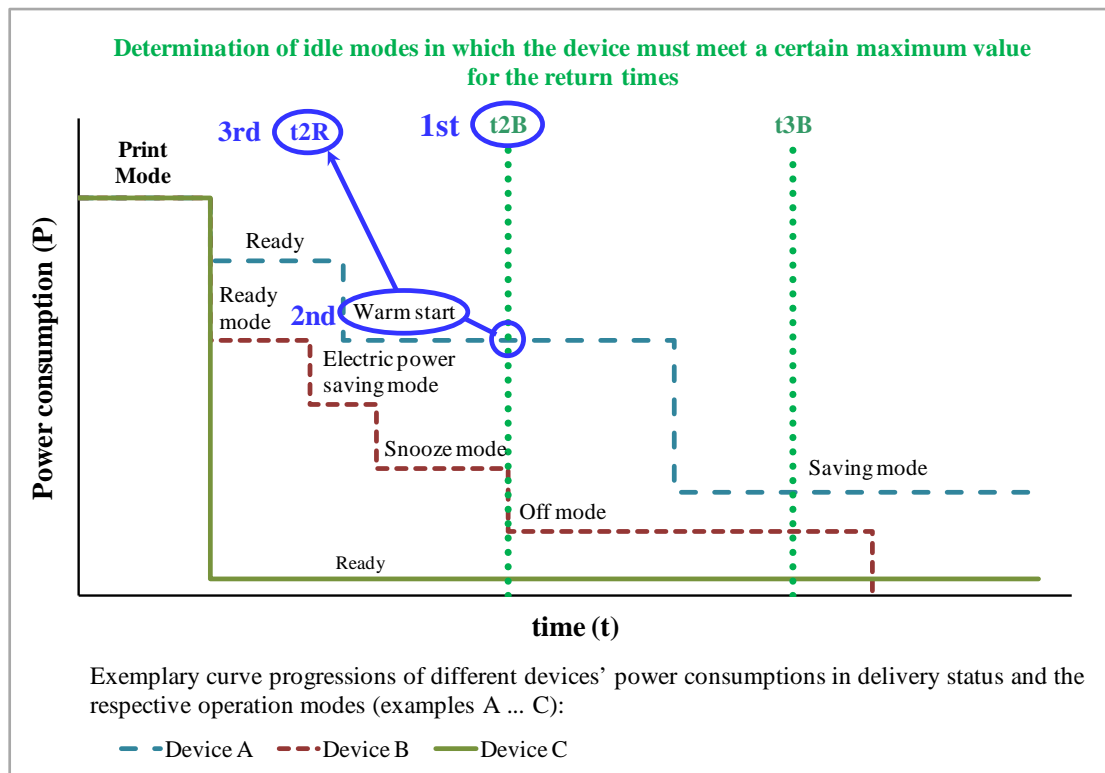
**Primary Functions to be Used for the Determination of Return Times**

Device Group	Primary Function to be Used
Devices with the Primary Function Copying	Copying
Other Devices	Printing

*Note: There are single devices for which the activation times of idle modes are different for the time after copying and for the time after printing. In addition, it can make a difference whether the device has been in the primary function copying or printing and whether it returns to one or the other; thus, we included this clarification.*

Written aids to understanding and advice on how to interpret data can be found in Appendix E-M1.

**Figure 3:**  
**Maximum Values for Return Times**



Guidance on how to read the example marked in blue in the above figure 3:

- 1<sup>st</sup> step: Select the appropriate value for  $t_{2B}$  from table 3.3 of the Basic Award Criteria.
- 2<sup>nd</sup> step: Check where  $t_{2B}$  meets the curve progression of the device's power consumption to determine the respective operation mode the device is in (for device A: warm start).
- 3<sup>rd</sup> step: Determine the return time (here:  $t_{2R}$ ) for this operation mode.

**Table 3.2:**  
**Maximum Values for Return Times**

	Values in Seconds	
	$t_{2R}$	$t_{3R}$
Maximum Values for $t_{2R}$ and $t_{3R}$	$t_{2R} = 0.42 * S_M + 5$ (maximum 30 sec.)	$t_{3R} = 0.51 * S_M + 15$ (maximum 60 sec.)

**Table 3.3:**  
**Times for Determining those Modes in which the Device Must Fulfill the Maximum Return Times (in Minutes)**

All Devices with a Page Throughput $S_M$ of	$t_{2B}$	$t_{3B}$
>0–5 Pages/Minute	5	10
>5–10 Pages/Minute	10	15
>10–20 Pages/Minute	10	20
>20–30 Pages/Minute	10	30
>30–40 Pages/Minute	10	45
>40 Pages/Minute	15	60

### 3.4.3 Maximum Values for Activation Times

↑ Electric power saving modes of office equipment with printing function according to para. 1.4 which are a) activated in delivery status and b) for which the user is free to adjust activation times within a certain range must fulfil the following requirements:

1. The upper limit of the range in which the activation time can be adjusted must not exceed the values given in table 3.4.
2. Provided that a device features multiple electric power saving modes, for each of these modes the time period starting from the end of the printing process is relevant.



*Note:* According to 1.4.6.2, activation time is defined as the time that elapses after the end of the ↑ printing process until the device enters an ↑ electric power saving mode.

*Example:* The device B in figure 3 features a page throughput  $S_M$  of 25 pages/minute. According to table 3.4, the upper limit for the range of the activation time is to be set at 60 minutes – measured from the end of the printing process. After 20 minutes (predefined adjustment), the idle mode “ready mode” is followed by the first electric power saving mode (“electric power saving mode”). The subsequent second electric power saving mode (“sleep mode”) can be adjusted in the range of 1 to 45 minutes – measured from the beginning of the first electric power saving mode (“electric power saving mode”). The upper limit of the range in which the second electric power saving mode (“sleep mode”) can be adjusted is 65 minutes (20 + 45 minutes) from the end of the printing process. Thus, the upper limit is above the limit of 60 minutes.

3. For the electric power saving mode, in which the device has to meet the maximum value as defined in para. 3.4.5, the maximum values given in table 3.4 apply to both the delivery status as well as the time after delivery. This means that any option for deactivating this electric power saving mode by the user (which would mean infinite activation time) must be excluded.

**Table 3.4:**

**Activation Times: Upper Limit for the Range of the Activation Times  $t_{iA}$  Adjustable by the User**

All Devices with a Page Throughput $S_M$ of	Minutes
>0–30 Pages/Minute	60
>30 Pages/Minute	120

### 3.4.4 Maximum Values for Power Consumption at Monochrome Printing ( $TEC_M$ )

The  $\uparrow TEC_M$  values of office equipment with printing function as defined in para. 1.4 must meet or exceed the maximum values which result from the values as set out in table 3.5. The  $\uparrow TEC_M$  values are to be determined as set out in Appendix E-M2.

Office equipment with printing function is available in numerous versions and specifications. These are a combination of

- the page throughput and
- the following other service-based performance features:
  - printing colour:
    - only monochrome printing or
    - monochrome and colour printing
  - primary functions:
    - $\uparrow$  copying
    - $\uparrow$  printing
    - $\uparrow$  digitising and transmission of data
    - $\uparrow$  sending and receiving of electronic messages and faxes as well as
    - $\uparrow$  shared work team support

For this reason, there are no single  $TEC_M$  maximum values defined for each possible combination of the above mentioned features. Instead, the  $TEC_M$  maximum values can be calculated by combining the service-based performance features mentioned above with the respective page throughput of a particular device.

The  $TEC_M$  maximum value for any device results from the sum of:

- two basic values which apply to all devices offering the primary function  $\uparrow$  printing and/or  $\uparrow$  copying (as both printers and copiers are capable of printing they both are in the scope of these Basic Award Criteria for office equipment with printing function) and
- special bonuses for the above mentioned service-based performance features of a particular device – provided that the device has such features. Note: the bo-

nuses are grouped in slightly different categories than listed above.

The values needed to calculate  $TEC_M$  maximum values are summarised in table 3.5. Figure 2 shows the progression of the  $TEC_M$  maximum values curve for typical combinations.

**Table 3.5:**

**Values for Determination of Typical Energy Consumption ( $TEC_M$ ) in Kilowatt-Hours Per Week**

1. Basic Values	$S_M \leq 25$ : 1.0 $S_M > 25$ : $0.3 + 1.0/1000 * S_M^{2.05}$
2. Bonuses for Performance Features:	
2.1 ↑ Scan Unit	0.3
2.2 ↑ Shared Work Team Support	$0.2 + 0.5/1000 * S_M^{1.8}$
2.3 ↑ Colour Printing	$0.4 + (9/1000 * S_F/S_M) * S_M^{1.4}$
$TEC_M$ Maximum Values =	Sum of All Values as Applicable for the Particular Device

Notes on the determination of the  $TEC_M$  maximum value:

- The maximum value results from the sum of the basic value and applicable bonuses. Which particular bonus can be applied depends on which of the respective performance features is offered by a device.
- The basic value and the bonuses are each to be calculated separately (values in kilowatt-hours per week). Then, these values are to be added up.
- It doesn't matter if the scan unit is used for ↑ copying or for ↑ digitising and transmission of data.

Appendix E-M1 contains examples on how to make such calculations.

### 3.4.5 Power Consumption in Sleep Mode

In the ↑ sleep mode the power consumption of office equipment with printing function according to para. 1.4 must not exceed a value of 4 watts.

#### **Compliance Verification:**

- *By completing the forms in Annex 1 and Annex 8a the manufacturer must state all equipment data which are crucial for the applicability of requirements. Amongst others whether or not the product offers monochrome and/or colour printing, what are its primary functions as base unit and, if applicable, after upgrading; apart from that the equipment values for the above-mentioned parameters of the typical energy consumption, the power consumption, activation times as well as return times. Annex 8a must additionally be submitted in MS Excel format. Apart from that, the manufacturer must state in Annex 1, that the product has been shipped to the laboratory in a condition corresponding to the normal delivery status – above all, with regard to activation times and other parameters influencing power consumption/energy consumption.*
- *With respect to power consumption and return time measurements according to Appendix E-M2 the manufacturer must submit the measurement report (Annex 8b).*
- *With respect to the measurement and determination of the typical energy consumption (TEC) for monochrome printing according to Appendix E-M2 the manufacturer must submit the respective measurement report (Annex 8c). This shall at least comprise the ENERGY STAR “TEC Data Collection Worksheet” which shall preferably be submitted in MS Excel format additionally.*
- *To the extent that user information, as required by Appendix E-I, are not contained in the information and data sheet (Annex 12) the distributor must (only) submit the respective excerpts from the product documentation (Annex 12a).*

## 3.5 Noise Emissions

### 3.5.1 Noise Emissions (with Reference to Test Values)

Noise emissions are evaluated by specifying the declared A-weighted sound power level ( $L_{WA,d}$ ) in decibels (dB) with one digit behind the decimal point, depending on operating speeds in pages per minute in colour ( $S_{co}$ ) and in monochrome mode ( $S_{mo}$ ).

#### Determination of A-weighted Sound Power Levels and Operating Speeds:

The A-weighted sound power level  $L_{WA}$  is determined according to ISO 7779:2010. Noise measurements are to be conducted with devices in default setting mode and without applying optional peripheral equipment (e.g. sorters, stackers, staplers, binders or cutters).

Devices of identical construction which differ in their maximum attainable print speeds must be tested in all configurations in which they shall be offered with reference to the Blue Angel.

- DIN A4 size paper with a grammage of 60 to 80 grams per square meter ( $g/m^2$ ) must be used for printouts.
- The test pattern (figure C.5b) according to ECMA-74:2010 (Appendix D-V) must be used for monochrome as well as for colour printing or copying.
- Devices capable of multiple colour printing must additionally be tested in full colour mode in the same way as described for monochrome printing.

The following specific requirements differ from ISO 7779:2010 and Annex C of ECMA-74:2010 and must be taken into account for testing:

#### General Requirements for both Print and Copy Modes:

- The A-weighted sound power levels and respective operating speeds of devices other than ink(jet) devices are to be conducted under the noisiest operating conditions possible for the base unit (usually at maximum print speeds).
- The A-weighted sound power levels and respective operating speeds of ink(jet)

devices are to be determined in “standard” print or copy mode (usually preset).

- Testing is to be carried out in simplex printing mode.

#### Printers:

- The measurement time interval starts at the beginning of the printing process (including preparatory steps, such as paper feeding and positioning of print heads) and ends after printing of the  $n$ -th page of the test pattern is completed.  $n$  shall be selected in order to meeting the number of pages to be printed according to the requirements for the measurement time interval as defined by ISO 7779. However, at least 6 pages are to be printed.

#### Copiers and Multifunction Devices (MFDs):

- Measurements have to cover scanning via the flat-bed scanner and printing of  $n$  copies of a single test pattern.  $n$  shall be selected in order to meeting the number of pages to be printed according to the requirements for the measurement time interval as defined by ISO 7779. However, at least 6 pages are to be printed.
- The measurement time interval covers the time period from the beginning of the scanning process to the end of the printing process which is when printing of the  $n$ -th page of the test pattern is completed. Intervals of zero noise emissions between the end of the scanning process and the beginning of the printing process – which impact noise measurements – are not to be included in the averaging of test results should they last longer than 3 seconds.

Measuring of the operating speeds  $S_{mo}$  and  $S_{co}$  in pages per minute is to be performed and recorded by the test laboratory in the same operating mode as noise measuring. Counting must begin after printing of the first page is completed and must end after one minute. Only complete printouts are to be taken into consideration.

- $S_{mo}$  = operating speed for monochrome printing in pages per minute
- $S_{co}$  = operating speed for colour printing in pages per minute

### Declared A-weighted Sound Power Level:

At least three specimen of a device model have to be tested in order for the sound power level to be considered as declared. This declared A-weighted sound power level  $L_{WAd}$  is to be determined following ISO 9296:1988, and specified in decibels (dB) with one decimal place. If noise emission measuring can be performed with one device only the following formula may be used as a substitute to determine the declared A-weighted sound power level  $L_{WAd}$ :

$$L_{WAd} = L_{WA1} + 3.0 \text{ dB}$$

( $L_{WA1}$  = A-weighted sound power level of one single device stated in dB with one decimal place)

### Test Values:

The declared A-weighted sound-power level  $L_{WAd}$  must not exceed 75 dB for Blue Angel-labelled devices. In addition, the declared A-weighted sound-power level  $L_{WAd}$  must not exceed the following test values  $L_{WAd,lim,mo}$  or  $L_{WAd,lim,co}$  in the respective print mode:

The test value  $L_{WAd,lim,mo}$  for monochrome printing is to be determined in dependence of the operating speed  $S_{mo}$  stated with one decimal place according to the following formula:

$$L_{WAd,lim,mo} = (59 + 0.35 * S_{mo}) \text{ dB}$$

The test value  $L_{WAd,lim,co}$  for colour printing on parallel systems is to be determined in dependence of the operating speed  $S_{co}$  in dB and stated with one decimal place according to the following formula:

$$L_{WAd,lim,co} = (61 + 0.30 * S_{co}) \text{ dB}$$

For serial electrophotographic colour devices with  $S_{co} \leq 0.5 S_{mo}$  compliance with  $L_{WAd,lim,mo}$  in monochrome print mode is required. In this case, compliance with  $L_{WAd,lim,co}$  in colour mode is not mandatory.

### Information on Noise Emissions:

For information on noise emissions, the value of the declared A-weighted sound power level  $L_{WAd}$  stated in dB with one decimal place and the respective operating

speed are to be specified in the user documents (user manual/product documents) as well as in Annex 12 in the respective environment and health-related statements.

For devices capable of colour printing or copying the declared A-weighted sound power levels and the respective operating speeds in monochrome mode and colour mode must be specified.

For devices with  $L_{WAd} > 63$  dB, the user information must, in addition, include the following wording according to para. 4 (Annex 12):

“Office equipment with a sound power level  $L_{WAd} > 63$  dB is not suitable for use in rooms predominantly used for intellectual activities. Because of their high noise emission they shall be placed in separate rooms.”

**Compliance Verification:**

*The manufacturer must demonstrate compliance with the criteria by attaching a completed Annex 9 to the application. This Annex 9 must be filled in and confirmed by the test laboratory on the basis of the test report. The test laboratory must be accredited according to ISO/IEC 17025 as well as according to ISO 7779 for acoustic measurements. The test laboratory must attach a copy of the valid accreditation certificates (Annex 10). The required user information must additionally be provided in the information and data sheet (Annex 12) according to para. 4.*



### 3.5.2 Noise Emissions (without Reference to Test Values)

#### Additional Declaration of A-weighted Sound Power Levels and Operating Speeds

For further development of the Basic Award Criteria, harmonisation with international standards shall be achieved by aligning the Blue Angel evaluation procedure with these standards. Therefore, the manufacturers shall provide additional test results without reference to test values which were determined according to such international standards

Devices capable of multiple colour printing must additionally be tested in full colour mode in the same way as described for monochrome printing.

#### Determination of operating speeds:

The operating speeds shall be determined using the test patterns and the performance measurement procedure either of ISO/IEC 24734, ISO/IEC 24735 or ISO/IEC 29183, as applicable.

- The performance values ( $FSOT_{30sec}$  and  $ESAT_{30sec}$ ) of printers and MFD without ADF shall be determined according to the “1 Set + 30 Seconds Test” in paragraph 5.1.2 of ISO/IEC 24734.
- The performance values ( $FSOT_{30sec}$  and  $ESAT_{30sec}$ ) of copiers and MFD with ADF shall be determined according to the “1 Set + 30 Seconds Test” in paragraph 6.1.2 of ISO/IEC 24735.
- The performance values ( $sFCOT_{30sec}$  and  $sESAT_{30sec}$ ) of copiers without ADF shall be determined according to the “1 Set + 30 Seconds Test” in paragraph 6.1.2 of ISO/IEC 29183.

#### Determination of A-weighted sound power levels and operating speeds:

The A-weighted sound power level  $L_{WA}$  shall be determined according to ISO 7779:2010 considering the following conditions.

- The 4-page Adobe Reader file from the Office Test Suite according to B.1 of ISO/IEC 24734 shall serve as test patterns for monochrome as well as for colour printing or copying.
- Only one-sided printing or copying shall be measured.

- Due to repetitive operation cycles, the measurement time interval shall include at least three complete outputs of the 4-page test pattern (12 pages).

At least three devices have to be tested that the A-weighted sound power level is to be considered as declared. The declared A-weighted sound power level  $L_{WA_d}$  shall be determined following the procedures of ISO 9296:1988, but it shall be declared in decibels (dB) with one decimal place. If the noise emission measurement can be performed on one device only the following formula may be used as a substitute to determine the declared A-weighted sound power level  $L_{WA_d}$ .

$$L_{WA_d} = L_{WA_1} + 3.0 \text{ dB}$$

where  $L_{WA_1}$  is the A-weighted sound power level determined by measurements for a single device, in dB with one decimal place.

For devices of identical construction according to Appendix B-M the following applies: If two devices of identical construction differ in their maximum print speed at monochrome printing the product printing at highest speed is to be tested.

When filing application for three or more devices of identical construction with different print speeds the product printing at highest print speed and another one featuring a lower print speed is to be tested.

For devices first put on the market before 1 January 2013 the additional declaration can be omitted.

**Compliance verification:**

*The above information can be provided by the manufacturer, even if the respective test laboratory is not accredited according to ISO/IEC 17025. The manufacturer must fill in Annex 8a on the basis of the test report and attach the completed annex to the application. Test laboratories should use the Annex 9b for reporting the A-weighted sound power level. Measuring of the performance values can also be carried out separately from the noise measurements. The determined values are not intended for publication but solely used for development of a future version of the Basic Award Criteria.*

#### **4 Product Documents and User Information**

The documentation supplied along with the equipment (user manual, product documents) must include environmental- and health-related user information in addition to the technical descriptions. This documentation must be made accessible to the user in electronic or in printed form (preferably printed on recycled paper). Regardless from this, a printed summary with brief information on the installation must be supplied along with the equipment.

Information on the below listed device functions as well as on the use of the office equipment with printing function must be summarised in a separate information and data sheet and include the following points:

- Battery take-back
- Usability of recycled paper according to 3.1.4
- Existence of a duplex unit or the capability of doing duplex printing on DIN A4 size paper according to 3.1.5
- Take-back of spent photoconductor drums (if applicable) according to 3.1.6
- Guarantee of repairs according to 3.1.7
- Information on the maintenance of equipment according to 3.1.8
- Information on device take-back and environmental-friendly disposal at the end of the use phase according to 3.1.9
- Information on the take-back of colour modules and colourant containers according to 3.2.2
- If applicable, information on yields according to 3.2.1
- Instructions for proper handling of toner modules according to 3.2.3
- Instructions for proper device placement with regard to substance emissions according to 3.3.4
- According to 3.4 and the requirements as set out in Appendix E-I to the Basic Award Criteria: information on electric power saving, on device data related to electric power consumption such as power consumption in the individual operating modes, activation times of idle modes and return times of the electric power saving modes as well as electric power consumption data according to ENERGY STAR

- Noise emission data given as declared sound power levels<sup>36</sup> according to 3.5.1
- Information on the fact that the device is awarded the environmental label Blue Angel, and a link to the website <http://www.blauer-engel.de>

The information and data sheet shall be available in printed form (preferably printed on recycled paper) or in electronic form and must at least be written in German. The information and data sheet (user information) must be enclosed with products offered and/or supplied under the Blue Angel eco-label or it must be referred to the electronic version (Annex 12). In addition, its contents have to be published by the distributor about four weeks after the device was put on the market and after completion of the Contract on the Use of the Environmental Label on the website where the respective device is presented. This can also be done by offering a link to this specific user information (e.g. "User information for {device designation} according to the requirements of the German environmental label Blue Angel RAL-UZ 171").

**Compliance Verification:**

*The distributor must submit the information and data sheet.*

*The distributor must state in Annex 2 that this data sheet will be enclosed with the products or that it will be referred to the electronic version, and that its contents will be published on the Internet around 4 weeks after the device was put on the market and the Contract on the Use of the Environmental Label was completed, and that the essential environmental and health-related information is also contained in the detailed product documents (user manual or electronic media), and, if applicable, the distributor must name the link providing access to this information.*

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<sup>36</sup> The declared sound-power level must not exceed a value of 75 dB during printing and copying. This is the acoustic test value for office devices based on calculations which ensure guaranteed compliance with the Workplaces Ordinance.

## 5 Outlook on Possible Future Requirements

Within the scope of the next revision of these Basic Award Criteria the following aspects shall presumably be taken into account:

- Possibilities of further harmonisation with other national eco-label programmes
- Review of material requirements for plastic components as well as for consumable materials
- Specification of requirements for use of recycled plastic materials in the manufacture of office equipment
- Substitution or limiting of the organotin compound content in toners, AMES test evaluation
- Limiting of CMT substances emissions and phenol emissions during the operating phase
- Definition of a test value for particle emissions of office equipment with printing function with a device volume greater than 250 l
- Review of the requirements for the electric power consumption of the devices in the lowest idle mode and limiting of the activation times as well as, if applicable, adaptation to new maximum values of the ENERGY STAR
- Determination of the page throughput for electric power consumption and noise emissions measurements according to applicable international standards, e.g. ISO 24734 and ISO 24735
- Definition of test values for noise emissions with reference to the page throughput S according to ISO 24734 and 24735, respectively

## **6 Applicants and Parties Involved**

**6.1** Manufacturers or distributors of products under para. 2 shall be eligible for application.

**6.2** 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 further develop the Basic Award Criteria

## **7 Use of the Environmental Label**

**7.1** 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.

**7.2** Within the scope of such contract the applicant undertakes to comply with the requirements under paragraph 3 while using the environmental label.

**7.3** Contracts on the Use of the Environmental Label are concluded to fix the terms for the certification of products under para. 2. Such contracts shall run until December 31, 2015.

They shall be extended by periods of one year each, unless terminated in writing by March 31, 2015 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.

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

**7.5** The Contract on the Use of the Environmental Label must include:

**7.5.1** The applicant (manufacturer/distributor)

**7.5.2** The brand/trade name, product designation

**7.5.3** The distributor (label user), i.e. the marketing organization under para. 7.4

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# CONTRACT

No.  
on the Award of the Environmental Label

RAL gGmbH, as label awarding agency, and the firm of

**(Distributor/Manufacturer)**

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:  
**Office Equipment with Printing Function (Printers, Copiers, Multifunction Devices)** for

**"(Brand/Trade Name - Product Designation)"**

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 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 "Vergabegrundlage für Umweltzeichen RAL-UZ 171" (Basic Criteria for Award of the Environmental Label RAL-UZ 171), as amended. This shall also apply to the reproduction of the Environmental Label (including the surrounding text). Claims for damages against RAL gGmbH, especially on the grounds of third party objections to the 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 he 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 Contributions 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 171 this contract will run until December 31, **2015**. It shall be extended by periods of one year each, unless terminated in writing by March 31, **2015** 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 firm of the

(Applicant/Distributor)

Sankt Augustin, this day of

Date, Place

RAL gGmbH  
Management

(Signature of authorized representative  
and corporate seal)