BLUE ANGEL

The German Ecolabel

Office Equipment with Printing Function (Printers and Multifunction Devices)

DE-UZ 219

Basic Award Criteria

Edition January 2021

Version 5

The Environmental Label is supported by the following four institutions:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

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

Umwelt Bundesamt

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

Jury Umweltzeichen

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

RAL gGmbH

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

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Version 1 (01/2021): First Edition, Expiry date: December 31, 2025
Version 2 (06/2021): Editorial changes in chapter 3.6.3
Version 3 (11/2021): Editorial changes in chapter 3.1.1.2, 3.2.3.2 and 3.5
Version 4 (01/2025): Prolongation without changes, Expiry date: December 31, 2027
Version 5 (01/2026): Specification of the scope, footnotes 15 & 37 added

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

1 Introduction

1.1 Preface

In cooperation with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, the German Environmental Agency and considering the results of the expert hearings conducted by RAL gGmbH, the Environmental Label Jury has set up these Basic Criteria for the Award of the Environmental Label. RAL gGmbH has been tasked with awarding the Environmental Label.

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

The product must comply with all the legal requirements in the country in which it is to be marketed. The applicant shall declare that the product meets this requirement.

1.2 Background

ICT equipment has become indispensable to companies and private households. Computers, office equipment with printing function, telephones and network technology accounted for by far the largest share of ICT-related electric power consumption in 2015 – at almost 44% or 21 TWh. These end devices only accounted for around 17% of the total ICT-related electric power consumption in companies, offices and the extended working environment, which corresponds to about 8 TWh.

Office equipment with printing function (printers and multifunction devices) that have been awarded the Blue Angel ecolabel consume considerably less electric power in comparison to the market average for this type of equipment. Using devices with a relatively low power consumption and low no-load losses (losses outside of the regular usage phase of the devices) makes a significant contribution to climate protection.

Nowadays, electrophotographic devices (LED and laser printers) and inkjet printers dominate 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. vacuum cleaning. The emissions from electrophotographic devices, as well as the potential health risks posed by these ultrafine particles (UFPs), have been the subject of public debate. Among other things, this also applies to electrophotographic desktop devices that are frequently found in private households, home offices and workplaces in companies and public authorities.

For such devices, the Indoor Air Hygiene Commission (IRK) of the German Environment Agency (UBA) recommends a test value for measurements in emission test chambers of 3.5×10^{11} particles per 10 minutes of printing. This test value was defined by the Indoor Air Hygiene Commission (IRK) based on general hygienic considerations. Due to the fact that the particles emitted from electrophotographic printing devices have different chemical compositions, the IRK did not focus on the toxicological profile of the emissions in each individual case but instead defined a test value based on general hygienic considerations with respect to exposure in the workplace and private households. This means that the test value takes into account both the observed amounts of particles released from common electrophotographic printing devices during their operation, as well as the typical substances contained in these particles and their size ranges. The IRK issued this recommendation in 2011. The technology used for these devices has advanced since then so that electrophotographic printing devices now emit fewer particles. As a

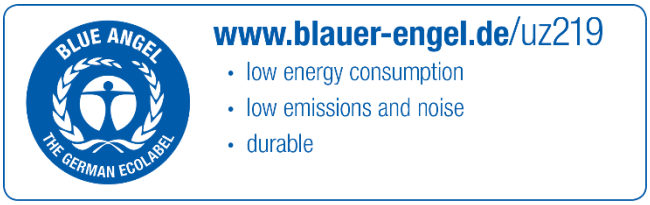
precautionary measure, the value set in these Basic Award Criteria will be based on what is technically feasible.
In addition, office equipment with printing function that have been awarded the Blue Angel ecolabel must fulfil requirements for their recycling-friendly design, selection of materials and longevity. Therefore, they provide good framework conditions for the efficient recovery of the materials used and help to preserve natural resources. In terms of the longevity of the devices and their repairability for private end users, the manufacturers are required for the first time to provide a clearly defined list of spare parts including repair information such as e.g. instructions, illustrations or exploded-view drawings. Furthermore, the products must contain a minimum level of recycled plastic (PCR plastic content).
Last but not least, low-pollutant materials must be used in the plastic parts of devices that have been awarded the Blue Angel ecolabel to reduce the risks posed to the environment and human health.
Requirements for the due diligence of companies in the sourcing of raw materials and support for local initiatives to promote responsible mining have been included in the Basic Award Criteria for the first time. In addition, criteria for social sustainability in the manufacturing process have also been added. These criteria are designed to promote compliance with the 8 ILO fundamental labour standards in the manufacturing process.

1.3 Objectives of the Environmental Label

Increased resource efficiency, the avoidance of pollutants and waste, climate protection and the reduction of energy consumption are key objectives of environmental protection.
The Blue Angel ecolabel for Office Equipment with Printing Function may be awarded to devices featuring the following environmental properties:

- durable and recycling-friendly design;
- avoidance and reduction of materials harmful to the environment and human health;
- low consumption of electric power;
- low noise emissions and pollutant emissions;
- socially responsible manufacturing.

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



1.4 Compliance with legal requirements

Observance of the legal regulations according to European and German law is a prerequisite for products labelled with the environmental label. In particular, this includes:

- The WEEE Directive (2012/19/EU)[1] implemented in German law in the Electrical and Electronic Equipment Act (ElektroG)[2] that regulates the disposal of products.
- The ROHS Directive (2011/65/EU)[3] implemented in German law in the German Material Ordinance for Electrical and Electronic Equipment (ElektroStoffV)[4] that regulates the pollutant content of products.
- The EU Directive 2006/66/EC[5] implemented in German law in the German Battery Act (BattG)[6].
- The substance requirements defined by the EU Chemicals Regulation REACH (1907/2006/EC)[7] and the POP Regulation (850/2004/EC)[8].
- The External Power Supplies Directive (278/2009/EC)[9] that regulates the ecodesign requirements for external power supplies.
- The EU Directive 94/62/EC on packaging and packaging waste implemented in German law in the German Packaging Law (VerpackG)[10].

1.5 Definitions

The following definitions apply when using these Basic Award Criteria.

1.5.1 User, manufacturer, distributor

1.5.1.1 User

User of the device, including network administrators. Product or service technicians of the company that distributes the device or is responsible for its maintenance are not considered users.

1.5.1.2 Manufacturer

A manufacturer is any natural or legal person who manufactures a product or commissions the development or manufacturing of a product and places the product on the market using its own name or brand.

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1 Directive 2012/19/EU on waste electrical and electronic equipment (new version); WEEE Directive
2 Law for the sale, return and environmental disposal of electrical and electronic equipment, Electrical and Electronic Appliance Act from 20 October 2015 (BGBl. I P. 1739); ElektroG
3 Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (new version); ROHS Directive
4 Ordinance to limit the use of hazardous substances in electrical and electronic equipment (Material Ordinance for Electrical and Electronic Equipment); ElektroStoffV
5 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, Official Journal of the European Union L339, P. 39, 2007, No. L139 P. 40
6 Law for the sale, return and environmental disposal of batteries and accumulators (Batteriegesetz - BattG) from 25 June 2009 (BGBl. I S. 1582), last amended by Article 1 of the Act of 20 November 2015 (BGBl. I S. 2071)
7 Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals; REACH Regulation
8 Regulation (EC) No. 850/2004 on persistent organic pollutants; POP Regulation
9 Regulation (EC) No. 278/2009 implementing directive 2009/125/EC (previously: 2005/32/EC) with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies; External Power Supplies Directive
10 Law for the sale, return and high-quality recycling of packaging (VerpackG) from 1 January 2019 (BGBl. I S. 1328)

1.5.1.3 Distributor

A distributor is a natural or legal person who makes a product available for the first time within the European Economic Area with a view to its distribution or use within the European Economic Area, whether for reward or free of charge and irrespective of the selling technique.

1.5.1.4 Professional repairer[11]

A person or a company which provides services for the professional repair and maintenance of office equipment with printing function.

1.5.2 Device designs

1.5.2.1 Base unit

This is the most basic version of a device which is 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. Modules for colourants do not count as part of base unit.

1.5.2.2 Inkjet device

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

1.5.2.3 Monochrome printing device

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

1.5.2.4 Colour printing device

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

1.5.2.5 Multifunction device

A product that performs the core functions of a printer and scanner. It may have a physically integrated form factor or it may consist of a combination of functionally integrated components. The copy functionality provided by multifunction devices is considered to be distinct from single-sheet convenience copying functionality sometimes offered by fax machines. This definition includes products marketed as multifunction devices and multifunction products.

1.5.2.6 Delivery status

The condition in which the manufacturer ships the device and in which the manufacturer has set the delay times of the different operating modes. In addition, the designs described in Appendix E-M must be taken into account.

[11] see Regulation(EU)2019/2021 – laying down ecodesign requirements for electronic displays

1.5.2.7 Professional devices

A printer or multifunction device marketed as intended for producing deliverables for sale, with the following features (according to the definition in ENERGY STAR 3.0):

a) Supports paper with basis weight greater than or equal to 141 g/m^2;
b) DIN A3-capable;
c) If device is monochrome, product speed equal to or greater than 86 pages per minute;
d) If device is colour, product speed equal to or greater than 50 pages per minute;
e) Print resolution of 600 x 600 dots per inch or greater for each colour;
f) Weight of the base unit greater than 180 kg; and

Five of the following additional features for colour devices or four for monochrome devices, included as standard with the professional device or as an accessory:

g) Paper capacity equal to or greater than 8,000 sheets;
h) Digital front-end (DFE);
i) Hole punch;
j) Perfect binding or ring binding (or similar, such as tape or wire binding, but not staple saddle stitching);
k) Dynamic random access memory (DRAM) equal to or greater than 1,024 MB.
l) Third-party colour certification (e.g. IDEAlliance Digital Press Certification, FOGRA Validation Printing System Certification, or Japan Color Digital Printing Certification, if product is colour capable); and
m) Coated paper compatibility.

1.5.3 Primary functions

1.5.3.1 Primary function

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

1.5.3.2 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.

1.5.3.3 Printing

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

1.5.3.4 Digitising and transmission of data

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

1.5.3.5 Sending and receiving of electronic messages and faxes

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

1.5.4 Printing and printing technologies

1.5.4.1 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. The page throughput S_M must be determined according to ISO/IEC 24734 and specified as an average ESAT value in simplex printing in office operation. The S_M value is an integer; the ESAT value[12] should be rounded down.
When determining this value for electrophotographic devices, the printing test pattern according to ISO/IEC 10561 (Dr. Grauert Letter) or so-called "continuous printing" may also be used.

1.5.4.2 Page throughput S_F

Similar to the page throughput S_M, the page throughput S_F specifies the number of DIN A4 size pages a device can print per minute in colour printing mode by transfer of data onto paper or similar materials. As with the page throughput S_M, the page throughput S_F must be determined according to ISO/IEC 24734. The S_F value is an integer; the ESAT value[12] should be rounded down.
When determining this value for electrophotographic devices, the printing test pattern according to ISO/IEC 10561 (Dr. Grauert Letter) or so-called "continuous printing" may also be used.

1.5.4.3 Printing unit

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

1.5.4.4 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.

1.5.4.5 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.

1.5.4.6 Black colourant printing

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

[12] 1 set + 30 second test; $ESAT_{30\ sec}$

1.5.5 Device parts

1.5.5.1 Scanning unit

Unit of the device used to convert paper originals (or similar) into electronic images that can be stored, edited, converted or transmitted – primarily for the purpose of data processing in a multifunction device or computer.

1.5.5.2 Accessory

An optional supplemental component that is not necessary for standard operation of the base unit, but that may be added before or after shipment in order to add new functionality or alter functions of the device. An accessory may be sold separately under its own model number or sold with a base unit as part of a multifunction device package or configuration.
Notes:

a) Examples of accessories are sorters, high-capacity paper feeders, paper-finishing equipment, large paper supply equipment, multiple output paper trays, 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 8a/8b.

1.5.5.3 Wireless network access point

A wireless network access point is a device whose primary function is to provide IEEE 802.11 (Wi-Fi) connectivity to multiple clients.

1.5.5.4 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 a separate power supply.

1.5.5.5 Module for colourant

A complex module of the device which in addition to the containers for colourant can include other components for transferring the colourant onto the media such as, for example, a photo semiconductor, a charging unit, a cleaning unit, an excess toner reservoir or an inkjet print head with nozzles and one or more integrated ink tanks.

1.5.5.6 Containers for colourant

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

1.5.5.7 Assemblies

Assemblies consist of at least two components that are joined together in a force-fit or form-fit manner.

1.5.5.8 Casing and casing parts

Casing and casing parts protect the fixtures from environmental impacts and the user from contact with moving and/or radiating components, as well as with components under voltage. The casing consists of casing parts.

1.5.5.9 Chassis

The chassis is the supporting component of the device.

1.5.5.10 Electric/electronic assemblies

Electric/electronic assemblies include at least one electronic or electric component.

1.5.5.11 Mechanical parts

Mechanical parts are not included in electric/electronic assemblies and perform mechanical or optical functions (except for the casing and chassis).

1.5.5.12 Exchange parts

Exchange parts are parts that are expected to need replacement during the intended service life under typical conditions of use (e.g. ink absorber, excess toner reservoir, paper feed). Exempted are parts that must not be exchanged by the user due to security or legal reasons.

1.5.5.13 Spare parts

Spare parts are components or assemblies that can potentially fail within the service life of the products. This includes e.g. hinges of casing parts, paper trays, etc. as well as cable connections and electronic components which might be damaged by overheating.

1.5.6 Materials and operating materials

1.5.6.1 Constituent components

Constituent components are substances added to the product as such or as part of a mixture in order to achieve or influence certain product properties and those required as chemical cleavage products for achieving the product properties. This does not apply to residual monomers that have been reduced to a minimum.

1.5.6.2 Colourant

A mixture in which dyes, pigments and other additives are dissolved or dispersed in a carrier material such as a polymer matrix (e.g. toners), liquid (e.g. inks), gel or wax (e.g. solid inks).

1.5.6.3 Substance[13]

A chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.

1.5.6.4 Mixture

Mix, mixture or solution composed of two or more substances.

[13] see REACH, Article 3, and CLP Regulation, Article 2.

1.5.6.5 Post-consumer recycled materials (PCR plastic)

Recycled plastic sourced from materials disposed of by households, commercial and industrial organisations or institutions who are the final consumers of products.

1.5.7 Operating modes

1.5.7.1 Standard operating mode

In standard operating mode, the product is connected to the mains power supply and actively performs a primary function.

1.5.7.2 Print mode

In print mode, the device produces output by printing on paper and similar materials – whether in the primary function copying, printing or when faxing.

1.5.7.3 Idle mode

The state that the product enters after the end of the printing process – immediately or upon expiry of a delay time (t_{iA}, …). In an idle mode, the power consumption (P_a, P_b, …P_S) of the device is usually lower than in print mode. In idle modes, the device is more or less ready for operation, i.e. it is able to quickly switch back to print mode. Ready mode and electric power saving modes are examples of idle modes. With respect to the Blue Angel requirements, the idle modes must be categorised according to Appendix E-M, i.e. a clear distinction must be made between the different modes.

1.5.7.4 Ready mode

This is the mode Z_a in which the device is not producing output, has reached operating conditions, has not yet entered any electric power saving mode and is ready to enter print mode with minimum delay. All device functions can be activated in this mode and the device is capable of returning to print mode by responding to any potential inputs including external electrical impulses (e.g. data network impulses, fax call or remote control) and direct physical interventions (e.g. activating a switch or button).
Note: Ready mode is the state that the device enters immediately after the end of the printing process.

1.5.7.5 Electric power saving mode

This is a mode (Z_b, Z_c, …) which the device enters after expiry of a delay 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. There are also devices with no electric power saving mode at all. These devices remain in ready mode, in which the power consumption is usually very low so that this ready mode fulfils the function of an electric power saving mode. Sleep mode and off-mode are electric power saving modes (if activated automatically).

1.5.7.6 Sleep mode

An electric power saving mode that a device enters either automatically or after expiry of a delay time. For devices with sleep modes that can be activated by different means, the mode which can be entered automatically is relevant for the requirements in these Basic Award Criteria. If the device has several subsequent sleep modes, the manufacturer can decide which sleep mode should be considered. However, the preset delay time stated by the manufacturer must match the selected sleep mode.

In addition to automatic activation, devices can also enter sleep modes by different means:

[1] at a time of day set by the user,

[2] in direct response to the activation of a physical switch or button by the user or in response to external electrical stimulus
or

[3] by other automatic processes depending on the user behaviour.
All product features can be activated in this mode. In addition, the device must be able to switch to a primary function by responding to **any** given input option which the device features, although this may be accompanied by a delay (recovery time). 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).

1.5.7.7 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 power supply.
If this mode 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. delay time or timer), it is often referred to as "auto-off". (See ENERGY STAR 3.0).

1.5.7.8 Remote management by a network administrator

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.

1.5.8 Time-related definitions

1.5.8.1 End of the printing process

The point in time when the last printed sheet of paper (or last piece of similar material) for the print job has left the printing unit of the device and 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 determining the end of the printing process for a certain device – e.g. if the device has multiple output trays – the earliest of these points in time should be considered the end of the printing process in the sense of these Basic Award Criteria.

1.5.8.2 Delay times (= Activation time) (t_{iA}, t_{iA} etc.)

The delay time is the time that elapses at the end of the printing process before the device enters an electric power saving mode.

1.5.8.3 Recovery time (= Return time) (t_{iR})

This is the time it takes the device to return to ready mode from an electric power saving mode. The recovery time should be determined as the difference between

a) the time required by the device to complete a particular print job from electric power saving mode Z_i (i.e. Z_b or Z_c or …) and
b) the time required by the device to complete the same job from ready mode Z_a.

1.5.9 Power consumption

1.5.9.1 Power consumption of the device (P_a, P_b, …)

The power consumption of the device in the different modes, i.e. in ready mode (P_a), in the electric power saving modes (P_b, P_c , etc.) and in off-mode (P_S). The power consumption is calculated as the total effective power consumption of the device measured at the power supply to the device. The power consumption of accessories is not included in the power consumption of the device which the distributor must state in Annex 8a/8b. In addition, the designs described in Appendix E-M must be taken into account.

1.5.9.2 Typical energy consumption for monochrome printing (TEC_M)

TEC_M is the power consumption for an assumed typical usage cycle of a device in kilowatt hours per week (kWh/week). The method for determining the TEC_M is based on the ENERGY STAR 3.0 method.[14]

2 Scope

These Basic Award Criteria apply to office devices (usually referred to as printers and/or multi-function devices) that at least:

- offer printing as their primary function,
- are capable of producing monochrome or colour printouts (4-colour printing) on standard paper with a grammage of 60 to 80 g/m^2,
- are capable of processing media with a minimum format of DIN A4 and up to a maximum format of DIN A3+
- and work as electrophotographic devices (LED or laser technology) by using toners or as inkjet devices by using inks (or gels or waxes).

The award criteria apply equally to new and used devices[15].

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

[14] If new versions of the ENERGY STAR are published it is necessary to check whether the measurement method needs to be adapted.

[15] Used devices here refers to devices that, after use by end users (leasing and purchase), are returned to the manufacturer or a refurbisher and, after undergoing testing and, if necessary, refurbishment, is resold.

marked with the environmental label from the respective distributor, including the materials recommended by the distributor in the product documents.
3D printers are not covered by the scope of these Basic Award Criteria.
Devices and systems that are operated using 3-phase alternating current (400 Volt) are excluded from the scope of these Basic Award Criteria.

3 Requirements

3.1 Resource conservation

From the perspective of resource conservation, a distinction is made between devices that are intended for use in a professional environment and devices that are intended for use by private final consumers.
Against this background and to ensure that the correct requirements are assigned to the respective product, the relevant device must be assigned to one of these categories in the application for the Blue Angel and this information must be provided to customers.

Compliance verification

The distributor shall indicate in the application whether the device is intended for use in a professional environment or for use by private final consumers.
The distributor will also include this information in the information and data sheet.

3.1.1 Design for recycling

To reduce the consumption of natural resources, the design of the office equipment certified with the Blue Angel must promote high-quality recycling and reuse of components. The following requirements support this goal:

3.1.1.1 Design for disassembly requirements

The devices must be designed in such a way that they comply with the requirements in the following table:

Table 1: Requirements regarding design for disassembly

No.	Requirement	Applies to assemblies	Must/should requirement
1	Parts made of mutually incompatible materials must be separable or connected by separation aids	Casing parts, chassis, electric/electronic assemblies, modules for colourants	Must
	Explanation: Connections between the casing and chassis, as well as between the chassis and electric/electronic assemblies, are important connections. Their separability is required for the separate reuse/recycling of the assemblies and materials and also for the quick and safe separation of components containing harmful substances. This also applies to glued labels (i.e. company logos and stickers). The term "separation aids" refers to e.g. predetermined breaking points.		
2	Electric/electronic assemblies must be easy to find and remove	Entire unit, including lamps	Must
	Explanation: The recycling strategy must focus on the removal of hazardous materials as a minimum. Electric/electronic assemblies and components according to Appendix 4 of the Electrical and Electronic Equipment Act (ElektroG), such as batteries and condensers which have a risk of containing hazardous substances, as well as fluorescent lamps containing mercury, must be easy to find and separate.		

No.	Requirement	Applies to assemblies	Must/should requirement
3	Detachable connections must be easy to find	Casing parts, chassis, modules for colourants	Should
	Explanation: Connections that have to be detached during disassembly must be easy and quick to find. If they are hidden, this should be stated on the product (e.g. by laser labelling or injection moulding).		
4	Disassembly can be completed using exclusively general-purpose tools	Casing, chassis, electric/electronic assemblies	Must
	Explanation: "General-purpose tools" refers to widely used, commercially available tools.		
5	Points of application and the work space required for disassembly tools must have been taken into account	Casing parts, chassis, electric/electronic assemblies	Must
	Explanation: The force applied by the tool is transmitted to the connecting element at points of application. This requires there to be enough work space for the tool to complete the loosening movement. In particular, this requirement covers snap-on connections, which, in contrast to the assembly process, can often only be loosened by using tools.		
6	All of the connecting elements that have to be disassembled for recycling must be accessible axially	Casing parts, chassis, electric/electronic assemblies	Should
	Explanation: Connections to be dismantled that can only be accessed with difficulty or indirectly increase the work involved in the disassembly process. For example, releasing screw connections that are accessible radially is time consuming.		
7	It must be possible to remove the screw connections between assemblies with no more than three tools	Casing parts, chassis, electric/electronic assemblies	Must
	Explanation: Standardised and uniform connection elements facilitate the disassembly process. The fewer tools that are needed, the easier it is to assemble and dissemble the device. A tool is characterised by its type of drive (e.g. Phillips-head screwdriver) and size of drive (wrench size).		
8	At least half of the connections between plastic components must be click/snap-on connections	Casing parts	Should
	Explanation: The proportion of click and snap-on connections is the basis for assessing whether joining techniques have been selected for ease of disassembly.		
9	Disassembly can be performed by one person	Entire unit	Must
	Explanation: Any number of snap-on connections in the same joining direction can be assembled simultaneously, whereas this is not always true for disassembly if the undercut angle is more than 90°. This requirement is not fulfilled if more than two snap-on connections have to be loosened at the same time.		
10	The supporting surface can be maintained during the entire disassembly process	Unit to be handled	Should
	Explanation: This requirement indirectly checks the hierarchical design of the unit.		
11	Casing parts are free of electronic assemblies	Casing parts	Must
	Explanation: To facilitate the clean and fast removal of hazardous materials and the separation of electronic components, all electric/electronic assemblies must be fastened to the chassis. The casing must not contain any electric/electronic assemblies. A control element fastened to the casing and any casing parts that also fulfil the function of the chassis are not considered as casing parts here.		
12	The manufacturer has carried out a trial disassembly (e.g. in accordance with No. 1-11) and recorded any shortcomings.	Entire unit	Must

3.1.1.2 Requirements concerning material selection for recyclability

Recycling-friendly materials must be selected in such a way that they comply with the requirements in the following table:

Table 2: Requirements concerning material selection for recyclability

No.	Requirement	Applies to assemblies	Must/should requirement
1	The variety of materials used for plastic components of similar function is limited to one material	Casing parts, chassis Mechanical parts (≥ 25g)	Must
	Explanation: The smaller the variety of materials, the more efficient the separation and recycling processes are. This requirement does not apply to parts that are demonstrably reused according to Paragraph 3.1.1.4.		
2	Components that are made of the same plastic are dyed uniformly or compatibly	Casing parts, modules for colourants	Should
	Explanation: Uniform dyeing of parts consisting of the same plastic improves possibilities for introducing material cycles for recycling. Compatible dyeings are different degrees of brightness of a colour (e.g. grey and anthracite). If different types of plastics also have different colours, this "colour code" facilitates the reliable type-specific separation of plastics. Control elements on the equipment are exempt from this requirement.		
3	The coating of plastic components is limited to the minimum level required. Galvanic coatings are not permitted.	Casing parts, modules for colourants	Must
	Explanation: Large-area lacquer coatings, vapour deposition and imprints on plastic components require additional treatment for removal if the materials are to be subsequently recycled. Reasons must be given for the coating of special parts. Laser inscriptions are not considered as imprints. Verifiably reused parts according to Paragraph 3.1.1.4. are not affected by this requirement.		
4	Recyclable materials and material composites are used.	Casing parts, chassis, modules for colourants	Must
	Explanation: This means that it is possible to produce recycled material identical to the original material (original recycling).		
5	Components and materials according to Annex 4 of ElektroG are easy to disassemble.	Entire unit	Must
	Explanation: Annex 4 of ElektroG defines a series of components that must be removed from old, separately collected electrical devices.		
6	Materials are selected in accordance with No. 1-5 and this process is documented in writing.	Casing parts, chassis, modules for colourants	Must
7	Plastic parts >25 g with a flat surface of at least 200 mm² are marked in accordance with EN/ISO 11469 with consideration to ISO 1043	Entire unit (exempted are plastic parts contained in reused complex assemblies)	Must
	Explanation: The marking of plastics enables all recycling companies to separate plastics by type.		
8	The minimum proportion of post-consumer recycled plastic or reused plastics or a combination of both is stated in the information and data sheet, calculated as a percentage by mass of the total plastic and indicated in intervals of 0-1%, 1-5%, 5-10%, 10-15%, 15-20%, etc. (in 5% intervals).	All assemblies without modules and containers for colourants	Must
	Explanation: The following parts may be excluded from the calculation of the proportion of post-consumer recycled plastics: printed circuit boards, cables, connectors, electronic components, optical components, electrostatic discharge (ESD) components, electromagnetic interference (EMI) components and biobased plastic material.		

3.1.1.3 Reusability of components and assemblies

To increase the reusability of components and assemblies, devices must be designed in such a way that they comply with the requirements in the following table:

Table 3: Requirements concerning the reusability of components and assemblies

No.	Requirement	Applies to assemblies	Must/should requirement
1	At least 50% of the components in the device, excluding standard parts, have an identical design to those in other devices from the same manufacturer and devices in the same performance category and generation	Entire unit	Must
2	Provisions have been made for the use of reconditioned assemblies or parts and this has been approved	Entire unit	Must
	Explanation: The manufacturer should be willing to use assemblies and parts refurbished under his supervision as spare parts or ETN (Equivalent To New) parts in the device.		
3	Modules or containers for colourants for single colours can be replaced separately	Modules and containers for colourants	Must
	Explanation: Separate replacement contributes to economical handling of materials.		
4	The use of refurbished toner modules and refurbished ink modules and containers according to DIN 33870-1 and 33870-2 is not prevented by constructive, software-based or other measures.	Entire unit	Must
5	Modules for colourants can be refurbished	Modules for colourants (exempted are containers for colourants)	Must
	Explanation: Reuse must not be precluded by constructive measures.		

Compliance verification

The manufacturer shall declare compliance with the requirements in Paragraphs 3.1.1.1, 3.1.1.2 and 3.1.1.3 in writing and submit the completed Annex 3a. The requirements have been complied with if in category M the answer is always "yes".
The manufacturer shall state which plastics are used in the casing for parts with a mass > 25 grams and provide a list of the plastics (according to Annex 4). The distributor shall also submit the information and data sheet in this context.

3.1.1.4 Take-back of devices for reuse

The take-back of devices for reuse is desirable. Reuse in the sense of these Basic Award Criteria means the reuse of devices or components for the same purpose after a refurbishment. The refurbishment may include the replacement of damaged parts or components.
If the manufacturer verifies that more than 50% of the devices (number or tonnage) are refurbished and reused/recycled due to his own activities, the exemptions to the requirements concerning material selection for recyclability described in Paragraph 3.1.1.2 can be utilised.
Information on the take-back and disposal of devices must be included in the product documents and the information and data sheet in all cases.

Compliance verification

The distributor shall describe the take-back and reuse activities and document their effectiveness (Annex 11). The distributor shall also submit the information and data sheet in this context.

3.1.1.5 Minimum use of PCR plastics or reused plastic parts

The use of PCR plastics or reused plastic parts makes a significant contribution to the conservation of resources and they must be used in the plastic parts of devices. The proportion of PCR plastics in the overall plastic mass (the following are excluded: printed circuit boards, labels, cable, plug, electronic components and optical components) of a base unit must be at least 5%. This requirement will be introduced gradually.

Devices must contain at least 5g of PCR plastic from 01.01.2021 (the following are excluded: printed circuit boards, labels, cable, plug, electronic components and optical components).

All devices for which an application is made for the Blue Angel for the first time from 01.01.2023 must contain 1% PCR plastic or reused plastics or a combination of both measured against the total plastic mass (the following are excluded: printed circuit boards, labels, cable, plug, electronic components and optical components).

All devices for which an application is made for the Blue Angel for the first time from 01.01.2024 must contain 5% PCR plastic or reused plastics or a combination of both measured against the total plastic mass (the following are excluded: printed circuit boards, labels, cable, plug, electronic components and optical components).

The award of the label and thus the contract for the Blue Angel will not be terminated if non-compliance with this criterion is due to temporary conditions outside of the control of the licence holder, including but not limited to fire, flood, earthquakes, acts of war, government measures, accidents, manpower difficulties or shortages of manpower, difficulties procuring materials, equipment or transport.

Compliance verification

The manufacturer shall list the total weight of all plastic parts in Annex 4a and state the plastic parts that contain PCR plastics or which have been reused, the proportion of the total weight of these parts accounted for by PCR plastics in grams or the proportion of the total weight of these parts accounted for by reused plastics and, in the case of PCR plastics, the type of plastic used. The manufacturer shall verify this by submitting a confirmation from the suppliers (letter from the supplier) or their pre-suppliers who provided the manufacturer with the respective plastic parts. (Annex 5 or Annex 5a)

If supply is temporarily interrupted, the manufacturer shall submit a document explaining the event including the date from which the supply of PCR plastic was interrupted and the date it was restored, as well as the reason for the interruption. If the interruption to supply was caused by the suppliers of the PCR plastic, this document must include a letter from the supplier explaining the cause of the interruption and the dates covered by the interruption.
An interruption to supply lasting more than 3 months or repeated interruptions at intervals of less than 6 months require a justification to be considered temporary.

Additives or fillers are not considered to be recycled plastic, except when the additives or fillers were sourced from recycled source material.

3.1.1.6 Photoconductor drums

- Photoconductor drums must not contain selenium, lead, mercury or cadmium or any of their compounds as constituent components.
- Spent photoconductor drums must be taken back by the distributor (free of charge return to the return facility) and either reconditioned for reuse or subjected to material recycling.
- The information and data sheet must include information on the take-back system and return facility. The facility must be located in Germany or the country where the product is being offered for sale using the Blue Angel ecolabel.

Compliance verification

The manufacturer shall declare in Annex 1 that the aforementioned substances are not contained in the photoconductor drums and the distributor shall declare in Annex 2 that replaced drums will be taken back and recycled. The distributor shall state the recycling method used (Annex 11) and refer to the take-back system in the information and data sheet (Annex 12; see also Paragraph 4).

3.1.2 Take-back of modules and containers for colourants

The distributor undertakes 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 for reuse or material recycling. This also applies to excess toner reservoirs. A third party (dealers or service agencies or companies engaged in the reuse/recycling of such modules) may be commissioned to perform this task. These third parties must be provided with instructions on the proper handling of excess toners. Non-recyclable product parts must be disposed of properly.
Modules and containers must 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 and the information and data sheet must include information on the return options.

Compliance verification

The distributor shall declare compliance with the requirements in Annex 2 and provide instructions to the recycling contractor on the handling of excess toners (e.g. by means of the EC Material Safety Data Sheet) and by using the following note: "Prevent toner dust from being released into the air." (Annex 6b).

3.1.3 Yield of inks and toner

In the case of devices intended for use by private final consumers, the ink/toner yield of modules/containers provided with the device must be indicated (if technically possible) according to ISO/IEC 19752, ISO/IEC 19798 and ISO/IEC 24711 or according to page coverage and this information must be stated in the information and data sheet.
The information and data sheet (if applicable) must contain information that the yield (of inks or toner) may be reduced during the initial use of the device or due to rinsing or calibration processes.

If the ink modules supplied to the customer with the device have a clearly reduced yield compared to the standard configuration, this must be indicated in the information and data sheet.

Compliance verification

If the device is intended for use by private final consumers, the distributor shall provide information in the information and data sheet about the yield of the toner and ink modules supplied with the device (Annex 12; see also Paragraph 4).

3.1.4 Paper handling

The consumption of printing paper contributes significantly to the device's total consumption of resources. Against this background, the devices must comply with the following requirements with respect to resource-conserving paper handling.

3.1.4.1 Usability of recycled paper

The devices must be capable of using recycled paper made out of 100% recovered paper that meets the requirements of EN 12281. The distributor is free to recommend certain types of recycled paper to users.
The information and data sheet must include the following note: "This equipment is suitable for use with recycled paper". A reference to EN 12281 can also be included.

3.1.4.2 Duplex printing and copying

For all devices with a speed higher than stated in **Fehler! Verweisquelle konnte nicht gefunden werden.**, the basic product must be automatically capable of duplex printing and copying and duplex printing must be set as the default. Devices that are specifically intended for special single-sided media for the purposes of single-sided printing (e.g. coated anti-adhesive paper for labels, direct thermal media, etc.) are exempt from this requirement.

Table 4: Requirements for automatic duplex printing

Product type	**Page throughput (S_M)**
Colour	S > 19
Monochrome	S > 24

Professional devices:
An automatic duplex unit must be provided on all professional devices at the time of purchase. Professional devices that are intended for single-sided printing on special single-sided media (e.g. coated anti-adhesive paper for labels, direct thermal media, etc.) are exempt from this requirement.
The Blue Angel requirements have been complied with if the product uses a duplex tray and corresponding information is given in Annex 11 and in the information and data sheet. (see ENERGY STAR 3.0)

3.1.4.3 Availability of N-up printing

Devices must be designed so that they can print and/or copy two or more pages of a document on one sheet of paper. Information on the availability of N-up printing must be provided in the information and data sheet.

Compliance verification

The manufacturer shall declare compliance with the requirements regarding resource-conserving paper handling (Annex 1) and the distributor shall submit the information and data sheet (Annex 12; see also Paragraph 4).

3.1.5 Longevity

A long or intensive service life of the devices makes a significant contribution to resource conservation. Against this background, the following requirements apply to devices intended for use by private final consumers that have been certified with the Blue Angel.

3.1.5.1 Information regarding supposed service life

The distributor must provide information in the information and data sheet about the typical service life or use intensity (e.g. in standard printed pages) for which the device is designed in its original configuration assuming typical user behaviour. The manufacturer must indicate the "typical use conditions" that were used to determine the typical service life of the device in the information and data sheet.

3.1.5.2 Exchange parts

The devices must be designed in such a way that all necessary exchange parts can be replaced by users themselves. The respective exchange parts must be made available for the user.

3.1.5.3 Repair options and spare parts

The distributor undertakes to make sure that the provision of spare parts and exchange parts for the repair of the devices and the infrastructure required for the repair is guaranteed for at least 5 years following the termination of production and that the user is informed about this availability of spare parts. Other parts which normally exceed the average service life of the product do not need to be made available as spare parts. The distributor undertakes to provide users with easily accessible repair options for the device. These repair options can consist of the possibility for the customer to send the device to the manufacturer's service centre via an authorised dealer or another logistical solution (parcel service) or that specialist dealers and repair companies who are independent of the manufacturer have access to the required spare parts and repair information.

For product models placed onto the market for the first time from 01.01.2022, the distributor undertakes to ensure that the supply of spare parts (see Table 5) and exchange parts for the repair of the devices, service information and firmware/software/drivers and the infrastructure required for the repair, if applicable, is maintained for at least 7 years after the last unit of the model was placed on the market and that the user is informed about the availability of these spare parts. In the case of remanufactured devices, the distributor undertakes to ensure that the supply of spare parts (see Table 5) and exchange parts for the repair of the devices, service information and firmware/software/drivers and the infrastructure required for the repair is maintained for at least 5 years after placing the devices on the market. This information must be provided to the user via a corresponding note in the information and data sheet.

Table 5: Spare parts that must be made available for at least 7 years for new devices and 5 years for remanufactured devices after the last unit of the respective model was placed on the market.

	Spare parts	
	For consumers	**For professional repairers[16]**
Electrophotographic devices	Excess toner reservoirs Paper cassettes External power supplies/power cable bel	Storage devices (HDD and SDD) Laser unit Drum cassette/unit Fuser unit Transfer belts/kits Toner collection unit Roller kits/paper feed rollers Control circuit boards Internal power supplies Control panel Maintenance kits
Inkjet devices	Excess ink reservoirs incl. ink sponges Print head (not integrated into the ink cartridge) Paper cassettes External power supplies/power cable	Storage devices (HDD and SDD) Roller kits/paper feed rollers Print head (not integrated into the ink cartridge) External power supplies/power cable Control circuit boards Control panel Ink collection tank/excess ink reservoirs

Other parts which normally exceed the average service life of the product do not need to be made available as spare parts.
The distributor undertakes to provide users with easily accessible descriptions of the repair options for the device online. These repair options can consist of the possibility for the customer to send the device to the manufacturer's service centre via an authorised dealer or another logistical solution (parcel service). At the same time, registered professional repairers or consumers must be given access to the required spare parts (according to Table 5) and repair information (e.g. instructions, illustrations or exploded view drawings).

3.1.5.4 Cleaning and maintenance

Cleaning and maintenance can help to preserve the functional and environmental properties of the device for longer. The product information must include information on the cleaning and maintenance intervals, as well as instructions on the proper completion of the cleaning and maintenance work.

[16] The manufacturer must provide information on his website on how professional repairers can receive access to information and spare parts. Manufacturers, importers or authorised representatives can request verification from professional repairers that:
- they have the required professional expertise to repair office equipment with printing function and comply with the rules and regulations for the repair of electrical devices. Reference to an official registration system for professional repairers (if such registration exists) will be accepted as verification of compliance with this requirement;
- the professional repairer has taken out insurance to cover their liability with respect to their work activities and can demonstrate that this is the case.

Compliance verification

For devices intended for use by private final consumers, the distributor shall declare compliance with the requirements regarding longevity and provide the relevant product and service information, as well as the information and data sheet (Annex 12; also see Paragraph 4).

3.1.6 Packaging

The plastics used for the packaging of the devices are not permitted to contain any halogenated polymers.
The plastics used must be marked in accordance with the currently valid version of Annex 5 of the German Packaging Law (Verpackungsgesetz).

Paper and cardboard in the packaging must contain at least the following proportions of recycled fibres for the following packaging materials:

- Paperboard: 80%
- Corrugated cardboard: 25%
- Solid fibreboard: 40%
- Wound tubes: 90%

Alternatively: The packaging design must be as simple as possible and must take into account easy reusability and the environmental impact related to disposal of the packaging. The distributor must provide detailed information, including the exact proportion of recycled materials used in the packaging.

Compliance verification

The distributor shall declare compliance with the requirements for plastic (Annex 2). For paper and cardboard, the distributor shall either declare that the packaging materials used for the products contain at least the stated proportions of recovered fibres (Annex 2) or provide detailed information on the packaging in Annex 2a.

3.2 Use of hazardous substances

In order to protect the natural environment and human health, the use of hazardous substances in the manufacturing and operation of the devices must be reduced as far as possible.

3.2.1 Hazardous substances in casings and casing parts: Material requirements for plastics

Halogenated polymers and halogenated organic compounds added as flame retardants are not permitted.
The following shall be exempt from this rule:

- fluoroorganic additives (e.g. anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed a proportion of 0.5 percent by mass;
- fluorinated plastics such as e.g. PTFE;
- plastic parts with a mass of less than or equal to 25 g. 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. However, they must not contain PBBs, PBDEs or chlorinated paraffins.
- Large-sized plastic parts that are verifiably reused and are marked according to 3.1.1.2, **Fehler! Verweisquelle konnte nicht gefunden werden.**, no. 9. However, they must not contain PBBs, PBDEs or chlorinated paraffins.

The flame-retardant materials used in plastic parts with a mass greater than 25 grams must be communicated to RAL gGmbH in confidence and identified using their CAS numbers.
In addition, no substances must be added to the plastics as constituent components that meet at least one of the conditions stated in Table 6:

Table 6: Conditions for the exclusion of substances from materials in casings and casing parts

Hazard class	**Hazard category**	**CLP Regulation (EC) No. 1272/2008**
Carcinogenicity	Carc. 1A, 1B	H350 May cause cancer.
Carcinogenicity	Carc. 1A, 1B	H350i May cause cancer if inhaled.
Germ cell mutagenicity	Muta. 1A, 1B	H340 May cause genetic defects.
Reproductive toxicity	Repr. 1A, 1B	H360 May damage fertility or the unborn child.
Substances included in the so-called "list of candidates" in accordance with Article 59 of the REACH Regulation. The version of the list of candidates at the time of application is valid.[17]		

The stated requirements also apply to any recycled materials used.

Compliance verification

The manufacturer shall declare compliance with the requirements in Annex 1. In the case of flame retardants, the manufacturer shall submit a written confirmation from the plastics supplier to RAL gGmbH confirming that no restricted substances are contained in the casing plastics (Annex 5). This also applies to any recycled plastics used in the device. The manufacturer also undertakes to request that the plastics supplier reports the chemical designation (CAS no.) of the flame retardants used in the plastics confidentially to RAL gGmbH (Annex 5).
If a substitution problem for permitted substances in casing plastics should arise due to changes to the candidate list at short notice, a transition period can be agreed with the German Environment Agency.

3.2.2 Hazardous substances in printed circuit boards

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

Compliance verification

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

[17] http://echa.europa.eu/de/candidate-list-table. For substances on the list of candidates, a general limit value of 0.1% (m/m) or a stricter value – calculated based on a classification in accordance with the hazard classes in the CLP Regulation – must be observed.

3.2.3 Hazardous substances in colourants

3.2.3.1 Restriction of the use of hazardous substances

Colourants such as toners inks, solid inks, etc. must not contain any substances as constituent components that fulfil the following conditions according to Table 7.

Table 7: Conditions for the exclusion of substances as intentionally added constituent components in colourants

Hazard class	Hazard category	CLP Regulation (EC) No. 1272/2008
Carcinogenicity	Carc. 1A, 1B	H350 May cause cancer.
Carcinogenicity	Carc. 1A, 1B	H350i May cause cancer if inhaled.
Carcinogenicity	Carc. 2	H351[18] Suspected of causing cancer
Germ cell mutagenicity	Muta. 1A, 1B	H340 May cause genetic defects.
Germ cell mutagenicity	Muta. 2	H341 Suspected of causing genetic defects.
Reproductive toxicity	Repr. 1A, 1B	H360 May damage fertility or the unborn child.
Reproductive toxicity	Repr. 2	H361 Suspected of damaging fertility or the unborn child.
Substances included in the so-called "list of candidates" in accordance with Article 59 of the REACH Regulation. The version of the list of candidates at the time of application is valid.[19]		

In addition, colourants must not contain any substances as constituent components which require labelling of the mixture according to Annex 1 of Regulation (EC) No. 1272/2008 with the following H phrases or which meet the criteria for such classification.

Hazard class	Hazard category	CLP Regulation (EC) No. 1272/2008
Specific target organ toxicity single exposure	STOT SE1	H370 Causes damage to organs.
Specific target organ toxicity single exposure	STOT SE2	H371 May cause damage to organs.
Specific target organ toxicity repeated exposure	STOT RE1	H372 Causes damage to organs through prolonged or repeated exposure.
Specific target organ toxicity repeated exposure	STOT RE2	H373 May cause damage to organs through prolonged or repeated exposure.

Compliance verification

The manufacturer shall declare compliance with the requirements in Annex 1 and enclose a declaration from the device manufacturer or the supplier of the ink or toner (Annex 6a) with the application. Safety data sheets for all of the colourants must also be enclosed with the application (Annex 6b). Provided that the safety data sheet for the toner does not show a negative AMES text, the test result for this test must be given separately (Annex 6c).

[18] An exemption is made for titanium dioxide that is required for technical reasons in toners (see Paragraph 3.2.3.2).

[19] http://echa.europa.eu/de/candidate-list-table. For substances on the list of candidates, a general limit value of 0.1% (m/m) or a stricter value – calculated based on a classification in accordance with the hazard classes in the CLP Regulation – must be observed.

3.2.3.2 Restriction to the use of titanium dioxide

The use of titanium dioxide (TiO_2) in powder form in the toner (mixture) must be limited. From 1 October 2021, the amount of actively added TiO_2 particle with aerodynamic diameter ≤ 10 µm must be lower than 1%.
The use of TiO_2 (with aerodynamic diameter ≤ 10 µm) < 1 % is still permitted because respirable emissions above the limit value for particle emissions are minimised in accordance with Paragraph 3.3.2.

Compliance verification

The applicant shall verify compliance by submitting a declaration from the device manufacturer or the supplier of the toner powder (Annex 6a).

3.2.3.3 Restriction to the use of heavy metals

No substances may be added to toners and inks which contain mercury, cadmium, lead, nickel or chromium VI compounds as constituent components. Exempted are high molecular weight complex nickel compounds as colourants.
Production-related contamination by heavy metals, such as cobalt, nickel oxides and organotin compounds, must be kept as low as technically possible and economically reasonable (ALARA principle = as low as reasonably achievable).

Compliance verification

The applicant shall verify compliance with the requirements by submitting a declaration from the device manufacturer or the ink or toner manufacturer confirming that no mercury, cadmium, lead, nickel, or chromium VI compounds have been added as constituent components and that production-related contaminations (by heavy metals such as cobalt, nickel or organotin compounds) have been minimized.

3.2.3.4 Azo dyes

Toners and inks are not permitted to contain azo dyes (dyes or pigments) that can release carcinogenic aromatic amines included in the list of aromatic amines in Regulation (EG) 1907/2006 (REACH Regulation), Annex XVII, Appendix 8[20].

Compliance verification

The applicant shall verify compliance with the requirement by submitting a declaration from the device manufacturer or the supplier of the ink or toner (Annex 6a).

3.2.3.5 Biocides in inks

Only those substances (active substances or biocides) may be used for which an active substance dossier for preservatives for products during storage (product type 6) according to the Biocidal Product Regulation (BPR, Regulation (EU) 528/2012) has been submitted. If inclusion on the list

[20] According to amending Regulation (EG) No 552/2009 of 22 June 2009

of approved substances for product type 6 is rejected after an evaluation has been completed, the use of this substance is no longer permitted.

Compliance verification

The applicant shall verify compliance with the requirement by submitting a declaration from the device manufacturer or the ink manufacturer (Annex 6a) and enclosing a valid safety data sheet.

3.2.3.6 Specific instructions for handling toner modules

Toner modules and containers must be sealed in such a way as to prevent the toners from leaking during storage and transport. The information and data sheet must include explicit instructions for the users of the device on proper handling of toner modules. In addition, the information and data sheet must include a note warning the user that toner modules must not be opened by force and that if toners have leaked as a result of improper handling, inhaling the toner dust and skin contact with the toner dust are to be avoided as a precautionary measure. Furthermore, the information and data sheet must include information on what to do in case of skin contact.
It should be emphasised that toner modules must be kept away from children.

Compliance verification

The distributor shall submit the information and data sheet (Annex 12; also see Paragraph 4).

3.3 Substance emissions

3.3.1 Comments

Electronic devices emit volatile organic substances into the indoor air. 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 should 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 ecolabel and by 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; for colour printing devices, the dust measurement is performed in colour printing mode. In addition, particle emissions are quantified during the printing process based on the particle number concentration.
The emissions are measured under defined conditions and specified as emission rates.
The emission rates are determined according to Appendix S-M to the Basic Award Criteria during the pre-operating phase[21] of the device, as well as during continuous printing. The maximum permissible emission rates are defined based on a use factor of 0.1 for monochrome printing devices in print mode, i.e. printing is actually only carried out during 10% of the time

[21] This pre-operating phase comprises the preset time profile of the device's power consumption for one hour.

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 devices, a use factor of 0.05, i.e. half of the above value, is assumed.
The use factor for the pre-operating phase is 1. The equipment-related emission of newly produced devices will, however, decrease over time. It is lower for desktop devices – primarily because of the lower material and component volume.
The maximum permissible emission rates for the pre-operating and print phases in Table 8 consider, from a precautionary perspective, the influence of the 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 the release of TVOCs, benzene and styrene, as well as 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 and 1,000 nm is possible – depending on the measurement equipment used. Appendix S-M defines the minimum requirements for the measurement equipment, as well as for their particle size range[22]. The predominant number of particles emitted by electrophotographic devices lies within this particle size range.

The emission rates in the pre-operating and print phases must be determined and recorded in accordance with the test methods described in Appendix S-M to the DE-UZ 219 Basic Award Criteria. They must not exceed the following values (Table 8). The toner types used for the measurement must be indicated in the test report. RAL gGmbH must be informed immediately if the toner type is changed and a new test report using the new toner type must be submitted:

[22] 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.

Table 8: 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]	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*[1]	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	$PER_{10\ PW}$ [particles/10min]*[2]	2.5* 10^{11}	2.5* 10^{11}

*[1] Please see the list of volatile organic compounds which must be considered when measuring emissions from office equipment with printing function (see Appendix S-M, Paragraph 4.5 VOCs).
*[2] The test value will be gradually introduced and will only come into force fully from 2025. See explanations below.

Provided that the determined emission rate also meets the test values for monochrome printing when printing out the colour test pattern, no additional testing of colour printing devices is required for monochrome printing. For colour printing devices, the dust emission rate is determined in colour mode, while it is determined in monochrome mode for monochrome devices. If the page throughput S_F is more than 20% below the page throughput S_M, a test in monochrome printing mode is also required and the test values for monochrome printing must also be fulfilled. The toner types used for the measurement must be indicated in the test report. RAL gGmbH must be informed about any change to the toner type and this will require the submission of a new test report.
The test report must always contain the month and year of manufacture of the device.

Particle emissions in the fine and ultrafine particle size range:
For colour printing devices, particle emissions are determined in colour mode. If the page throughput S_F is more than 20% below the page throughput S_M, a test in monochrome printing mode is required and the test values must be fulfilled. For monochrome devices, particle emissions are determined in monochrome mode.
The particle emissions can be tested on all configurations of identical construction. The size of the test chamber must in each case comply with the criterion for the loading factor according to Appendix S-M, Paragraph 4.2.
If the particle emissions are "not quantifiable" according to Appendix S-M, Paragraph 4.9.3, Step 9, the test value is considered to have been fulfilled.

From 01.01.2021, the test value for $PER_{10\ PW}$ [particles/10min] of ≤ $3.5*10^{11}$ is valid.
From 01.01.2023, the test value for $PER_{10\ PW}$ [particles/10min] of ≤ $3.0*10^{11}$ is valid.
From 01.01.2025, the test value for $PER_{10\ PW}$ [particles/10min] of ≤ $2.5*10^{11}$ is valid.

Compliance verification

The manufacturer shall submit a form completed by the testing institution (Annex 7a) confirming compliance with the requirements of the Basic Award Criteria regarding the substance emissions for black colourant printing with monochrome printing devices, as well as for colour printing and, if applicable, for monochrome printing with colour printing devices.
A copy of the complete test report according to the testing guidelines (Appendix S-M) must be enclosed (Annex 7b). The qualification of the testing institution for the emission measurements according to Paragraphs 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 4.2 and documented in an annex to the test report.

3.3.3 Inkjet devices

TVOCs must be determined for inkjet devices on the basis of the work instructions in Appendix S-M when printing out the respective printing test pattern. Testing must be performed at the print speed that is referred to by the manufacturer as normal or standard mode and which is usually factory preset. The emission rates during the print phase must be determined and recorded in accordance with the test method described in Appendix S-M to the DE-UZ 219 Basic Award Criteria. They must not exceed the following values (**Fehler! Verweisquelle konnte nicht gefunden werden.**):

Table 9: Permissible test values for emission rates determined according to Appendix S-M for inkjet 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 (see Appendix S-M, Paragraph 4.5 VOCs)

Provided that the determined emission rate also meets the test values for monochrome printing when printing out the colour test pattern, no additional testing of colour printing devices is required for monochrome printing. If the page throughput S_F is more than 50% below the page throughput S_M, a test in monochrome printing mode is also required and the test values for monochrome printing must also be fulfilled.

The test report must list the types of ink used for testing. RAL gGmbH must be informed about any change to the ink type and this will require the submission of a new test report.

Compliance verification

The manufacturer shall submit a form completed by the testing institution (Annex 7a) confirming compliance with the requirements of the Basic Award Criteria regarding the substance emissions. A copy of the complete test report according to the testing guidelines (Appendix S-M) must be enclosed (Annex 7b).
The qualification of the testing institution for the emission measurements according to Paragraphs 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 4 and documented in an annex to the test report.

3.3.4 User information on substance emissions

The distributor must state in the information and data sheet that testing was carried out according to the requirements of the Blue Angel ecolabel by using the consumables (types of toners or inks) supplied and recommended by the manufacturer and that those requirements were met.
Furthermore, the distributor must state that new electronic devices generally emit volatile substances into the indoor air and that the user should, therefore, 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 shall submit the information and data sheet (Annex 12; also see Paragraph 4).

3.3.5 Products of identical construction

If two devices of identical construction differ in their maximum print speed for monochrome printing, the product that can print at the highest speed must be tested.
The result can be transferred to those devices of identical construction whose print speed is not more than 20% slower than the tested print speed.
When submitting an application for three or more devices of identical construction with different print speeds, the product that can print at the highest speed and another product that prints at a lower print speed must be tested.
Further information on devices of identical construction can be found in Appendix B-M to the Basic Award Criteria.

3.4 Energy consumption

Reducing the energy consumption of devices makes an important contribution to climate protection. The Blue Angel is awarded to devices that are particularly energy efficient. Against this background, these Basic Award Criteria place requirements on the following operating modes and device properties:

- Typical Energy Consumption (TEC_M) (→ according to the definition in Paragraph 1.5.9.2),
- Sleep Mode (→ according to the definition in Paragraph 1.5.7.6),
- Maximum delay times (→according to the definition in Paragraph 1.5.8.2),

- Maximum recovery times (→ according to the definition in Paragraph 1.5.8.3) and
- Off-mode (→ according to the definition in Paragraph 1.5.7.7).

The measurements of the power consumption, typical energy consumption (TEC_M), delay times and recovery times must be carried out in accordance with Appendix E-M. In its delivery status, the device must meet all of the requirements stated in Paragraph 3.4.

3.4.1 Typical energy consumption (TEC) according to ENERGY STAR 3.0 [23]

The TEC_M value for the office equipment with printing function must comply with the maximum TEC_{Mzul} value, i.e. the following applies: $TEC_M \leq TEC_{Mzul}$. The values TEC_{Mzul} and TEC_M are not rounded for the comparison. TEC_M is rounded to the nearest 0.01 kwh/week for publication. (according to ENERGY STAR 3.0).
The maximum permissible value (TEC_{Mzul}) is dependent on the page throughput S_M and the device type (printer or multifunction device, monochrome device or colour printing device). The calculation must be carried out in accordance with ENERGY STAR 3.0 Paragraph 3.3 and Paragraph 3.4 for professional devices.

Compliance verification

The manufacturer shall submit all of the device data in Annex 8a that are decisive for applying the requirements: Type of device (printer or multifunction device, monochrome printing device or colour printing device), page throughput in monochrome printing mode and the typical power consumption values for the device. The manufacturer shall also submit Annex 8a to RAL gGmbH in Microsoft Excel format.
The manufacturer shall submit a measurement report (Annex 8c) which verifies compliance with the values stated in Annex 8a. This should include at least the "TEC Data Collection Worksheet" for the ENERGY STAR standard. Measurements carried out by testing laboratories accredited according to ISO/IEC 17025 for these types of tests or by the manufacturer's laboratory will be accepted. If the measurement was carried out by an accredited testing laboratory, the manufacturer shall submit the valid accreditation certificate (Annex 8d).

3.4.2 Sleep mode

3.4.2.1 Maximum power consumption

Office equipment with printing function must have a maximum power consumption in sleep mode of 2 Watt. An exemption is made for devices with a wireless network access point. These devices are permitted to have a maximum power consumption of 3 Watt.

Compliance verification

The manufacturer shall submit all of the device data in Annex 8a that are decisive for applying the requirements: with/without wireless network access point, as well as the energy consumption value in sleep mode. The manufacturer shall submit a measurement report (Annex 8b) which verifies compliance with the values stated in Annex 8a. Measurements carried out by testing laboratories accredited according to ISO/IEC 17025 for these types of tests or by the

[23] As soon as the final version of the current ENERGY STAR standard has been published, a discussion will be held to decide whether the new version can be adopted.

manufacturer's laboratory will be accepted. If the measurement was carried out by an accredited testing laboratory, the manufacturer shall submit the valid accreditation certificate (Annex 8d).

3.4.2.2 Maximum delay times

In its delivery status, the office equipment with printing function must be configured to automatically enter an electric power saving mode after a defined delay time. Typically, devices have multiple electric power saving modes. The following requirements with respect to delay times apply to the sleep mode (according to the definition in Paragraph 1.5.7.6), which has a maximum power consumption of 2 Watt, or 3 Watt for devices with a wireless network access point (see Paragraph 3.4.2.1). If more than one electric power saving mode fulfils these criteria, the manufacturer must report which mode was used for the measurements.
The maximum delay times which can be adjusted by the user must not exceed the following values:

Table 10: Upper limit for the range of the delay times t_{iA} for the sleep mode adjustable by the user

All devices with a page throughput S_M of	**Minutes**
> 0 … 30 Seiten/Minute	60
> 30 Seiten/Minute	120

The maximum default ("as-shipped") delay times must not exceed the values in the following table.

Table 11: Upper limits for default delay times [Minutes]

S_M	**MFD**	**Printer**
0 - 10	15	5
11 - 20	30	15
21 - 30	45	30
31 - 50	45	45
> 51	45	45

Compliance verification

The manufacturer shall state the default and maximum adjustable delay times in Annex 8a. The manufacturer shall submit a measurement report (Annex 8b) which verifies compliance with the values stated in Annex 8a. Measurements carried out by testing laboratories accredited according to ISO/IEC 17025 for these types of tests or by the manufacturer's laboratory will be accepted. If the measurement was carried out by an accredited testing laboratory, the manufacturer shall submit the valid accreditation certificate (Annex 8d).

3.4.3 Maximum values for recovery times t_{2R} and t_{3R}

Office equipment with printing function must return to ready mode from idle modes within the defined maximum times. The operating modes relevant for the maximum recovery times t_{2R} and t_{3R} are the modes the device has entered after times t_{2B} and t_{3B} following the end of the last printing process as defined in the following table.

Table 12: Times for determining the operating mode relevant for recovery times t_{2R} and t_{3R}

All devices with a page throughput S_M of				**t_{2B}**	**t_{3B}**
> 0	…	5	pages per minute	5	10
> 5	…	10	pages per minute	10	15
> 10	…	20	pages per minute	10	20
> 20	…	30	pages per minute	10	30
> 30	…	40	pages per minute	10	45
> 40			pages per minute	15	60

For the operating mode that the device has entered after t_{2B}, the device must meet the maximum recovery time $_{2R}$, while for the operating mode that the device has entered after t_{3B}, the device must meet the maximum recovery time t_{3R} as defined in the following table:

Table 13: Maximum values for recovery times

	Value in seconds	
	t_{2R}	**t_{3R}**
Maximum values for t_{2R} and t_{3R}	$t_{2R} = 0.42 \times S_M + 5$ maximum 30 seconds	$t_{3R} = 0.51 \times S_M + 15$ maximum 60 seconds

The measurement of the recovery times must be performed in accordance with the guidelines in Appendix E-M.

Compliance verification

The manufacturer shall state the maximum values for the recovery times in Annex 8a according to Appendix E-M. The manufacturer shall submit a measurement report (Annex 8b) which verifies compliance with the values stated in Annex 8a. Measurements carried out by testing laboratories accredited according to ISO/IEC 17025 for these types of tests or by the manufacturer's laboratory will be accepted. If the measurement was carried out by an accredited testing laboratory, the manufacturer shall submit the valid accreditation certificate (Annex 8d).

3.4.4 Off-mode

3.4.4.1 Maximum power consumption

The power consumption of office equipment with printing function in off-mode must not exceed 0.4 Watt.

Compliance verification

The manufacturer shall state the power consumption in off-mode in Annex 8a according to Appendix E-M. The manufacturer shall submit a measurement report (Annex 8b) which verifies compliance with the values stated in Annex 8a. Measurements carried out by testing laboratories accredited according to ISO/IEC 17025 for these types of tests or by the manufacturer's laboratory will be accepted. If the measurement was carried out by an accredited testing laboratory, the manufacturer shall submit the valid accreditation certificate (Annex 8d).

3.4.4.2 Auto-off function

Office equipment with printing function that were placed on the market for use by private final consumers[24] must have an auto-off function that switches the device to off-mode after a maximum of 4 hours without a printing operation. The auto-off function must be preset at the time the device is delivered but can also be deactivated or changed by the user. This requirement does not apply to devices whose main function contain "sending and receiving of electronic messages and faxes".
Information on the auto-off function must be provided in the information and data sheet and in Annex 12. This criterion applies to devices for which a new application is made for the Blue Angel for the first time from 01.01.2022.

Compliance verification

The manufacturer shall confirm the existence and default setting for the auto-off function in Annex 8a.

3.4.4.3 Availability of switches

The device must have a switch to manually enter the off-mode or an operating mode with a lower power consumption (e.g. double-pole off with separation of power supply). The design of the symbols on switches and buttons must comply with the relevant criteria according to the IEEE 1621 standard.
The switch must be easily accessible for the user when the device is placed in a normal setup position. Easy accessibility must also be ensured if the device is upgraded (e.g. with accessories). The device must be designed in such a way that it can be switched to off-mode or a mode of a lower power consumption at least twice a day during the typical service life of the device without sustaining damage.

Compliance verification

The manufacturer shall confirm the availability of the required switches in Annex 1.

3.4.5 Information and data sheet

The distributor must provide the following information for the idle modes in the information and data sheet (Annex 12):
a) Delay times
b) Recovery times
c) Power consumption
These three points describe the device's (electric power saving) behaviour in its delivery status.

- Information on how to define the different idle modes is provided in Appendixes E-M and E-I.
- The device must meet the requirements for electric power saving behaviour in all cases – see points a) and b) above.
  - This applies as soon as the device has completed any primary function – not just copying or printing – and does not have to perform any other primary function.

[24] The distributor shall state in Annex 2 whether the device is intended for use by private final consumers.

- This also applies if the device is connected to a data network. Signals received via the data network that do not serve the performance of a primary function[25] must neither "wake up" the device, i.e.
- switch the device to a higher power consumption mode, e.g. ready mode,
- nor keep it from switching in accordance with the set delay times.

For devices that support remote configuration by a network administrator, the following exemption applies: For the time required for the remote configuration processes by a network administrator, the device is permitted to enter a higher power consumption mode; however, it is not allowed to enter ready mode.

- 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, the distributor must 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 points a) and b) above*" and "*do not affect the electric power saving functions of the device*" have the meaning that the values for
  - delay times

  and
  - recovery times

  must not be increased. This is designed to ensure that important times for saving electric power are not extended. It thus excludes the possibility that idle times are deactivated (the delay time will be extended to an unlimited time if it is deactivated).

3.5 Noise emissions while printing

The noise emissions are evaluated by the statistical upper limit A-weighted sound power level $L_{WA,c}$ in decibels (dB) to one decimal place, depending on the page throughput S_M or S_F.
Devices of identical design which differ in their maximum page throughput must be tested in all configurations in which they are to be offered with reference to the Blue Angel.

Determination of the A-weighted sound power level

The A-weighted sound power level L_{WA} is determined in accordance with ISO 7779. Devices capable of colour printing must be tested in both monochrome mode ($L_{WA,M}$) and colour mode ($L_{WA,F}$).

- Noise measurements must be conducted without additional accessories.
- A4 size paper of grammage 60 g/m² to 80 g/m^2 must be used for the test operations.
- The 4-page Adobe Reader file from the Office Test Suite according to Annex C.1 of ISO/IEC 24734:2021 should be used as the test pattern.
- Only one-sided printing is used for the measurements.
- The measurements must only be carried out during repetitive printing operation cycles. The noise measurement must include at least three complete outputs of the 4-page test pattern (12 pages). The measurement should begin after the printing preparation.

Statistical upper limit A-weighted sound power level

[25] For example: server requests regarding the device's status.

At least 3 devices must be tested for each model. The statistical upper limit A-weighted sound power level $L_{WA,c}$ is determined in accordance with ISO 9296:2017 and stated in decibels (dB) to one decimal place. If it is only possible to carry out the noise emission measurements on one device, the following formula can be used as an alternative to find the statistical upper limit A-weighted sound power level $L_{WA,c}$.

$$L_{WA,c} = L_{WA1} + 3.0 \text{ dB}$$

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

Limit

The statistical upper limit A-weighted sound power level for monochrome mode $L_{WAc,M}$ and colour mode $L_{WAc,F}$ must not exceed the limit. The limit $L_{WA,lim}$ is determined to one decimal place based on the relevant page throughput for monochrome mode (S_M) and colour mode (S_F) in accordance with the following formula:

$$L_{WA,lim} = 48+14*\lg(S_{M/F}+4) \text{ dB}$$

For a page throughput of $S_{M/F} \leq 10$, the limit value $L_{WA,lim} = 64$ dB.

Information on noise emissions

The values for the statistical upper limit A-weighted sound power level $L_{WA,c}$ in dB to one decimal place and the relevant page throughput $S_{M/F}$ in ipm must be indicated in the information and data sheet under "Environmental and health-related statements". For devices capable of colour printing, the statistical upper limit A-weighted sound power levels $L_{WAc,M}$ and $L_{WAc,F}$ and the corresponding page throughput S_M and S_F must be indicated for monochrome mode and colour mode.

Compliance verification

The applicant shall verify compliance with the criteria by enclosing a completed Annex 9 with the application. Annex 9 shall be completed and confirmed by the testing institution based on the test report. The testing laboratory must be accredited according to ISO/IEC 17025 and also accredited for the required acoustic test in accordance with ISO 7779. The testing institution shall enclose a copy of the valid accreditation certificate (Annex 10). The applicant shall also include the required user information in the information and data sheet (Annex 12). The manufacturer shall state the required date in Annex 8a.

3.6 Social criteria

3.6.1 Due diligence of companies in the sourcing of raw materials

The manufacturer must carry out due diligence with respect to human rights for the conflict materials tin, tantalum, tungsten and their ores as well as gold contained in the office equipment with printing function by implementing the "OECD Due Diligence Guidance for Responsible

Supply Chains of Minerals from Conflict-Affected and High-Risk Areas" (in its currently valid version)[26].

Compliance verification

The applicant shall verify compliance by submitting a report from the manufacturer of the devices in Annex 14 by 01.01.2022 at the latest. The report must cover the entire process for due diligence with respect to human rights in the supply chain for the conflict materials tin, tantalum, tungsten and gold in accordance with the "OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas" (in its currently valid version) and be audited by an independent, third party auditing body by 01.01.2024 (Annex 15). The auditing body must meet the requirements for independence (Chapter VIII(A) of the Fair Labor Association (FLA) Charta), expertise and accountability (ISO 19011) of the independent, third party auditing body. Reports from the following auditing bodies will be recognised in all cases:

- *Reports from an RBA-approved auditor based on an audit according to the RBA VAP Standard in section D7 of the currently valid version of the Responsible Business Alliance Code Of Conduct*
- *Auditing bodies accredited according to SA 8000*
- *Reports created according to the Dodd Frank Act (Section 1502) using the CMR template or the EU Conflict Minerals Regulation (2017/821) and submitted to the US Securities and Exchange Commission (SEC).*
- *Reports from other auditing bodies may be approved upon application to the German Environment Agency.*

The applicant shall provide RAL gGmbH with a weblink to the published report from the manufacturer that covers all steps of the OECD due diligence process (annex 1) after successful verification of the report by a third party auditing body. The report must not be more than 2 years old at the time the application is submitted.

3.6.2 Support for local initiatives to promote responsible mining[27]

The manufacturer must verify for the conflict materials tin, tantalum, tungsten and their ores as well as gold contained in the office equipment with printing function that he actively supports local initiatives in the region that promote the sustainable mining of these conflict materials in conflict-affected and high-risk areas. Initiatives in the region should follow a holistic approach and focus on both human rights issues as well as other relevant social and environmental issues.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 16 and confirm that the manufacturer of the devices (or also the parent company) supports at least one of the following local initiatives to promote responsible mining:

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[26] OECD (2016): OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, https://www.oecd-ilibrary.org/docserver/3d21faa0-de.pdf?expires=1599218453&id=id&accname=ocid56027324&checksum=F06674E97B704C399E6661296FF0F35A, Version: 2020.

[27] As the market share accounted for by conflict free and certified tin, tantalum, tungsten and gold from conflict-affected and high-risk areas is still very low, it has not been possible to promote the use of these conflict-free raw materials up to now

- *Solutions for Hope (SfH)*[28]
- *ITSCI Programme for Responsible Mineral Supply Chains*[29]
- *Fair Trade Gold*[30]
- *Fairmined Gold*[31]
- *Responsible Minerals Initiative*[32]
- *Conflict Free Tin Initiative (CFTI)*[33]
- *The European Partnership for Responsible Minerals (EPRM)*[34]

Membership of the manufacturer of the devices in one of the above-mentioned initiatives will be accepted as verification. This membership can be verified, for example, by the presence of the manufacturer's name on the list of members on the website of the relevant initiative(s).[35]

3.6.3 Social sustainability in the manufacturing process

The manufacturer must ensure compliance with the following fundamental working conditions during the manufacturing process for the office equipment with printing function.
The 8 ILO fundamental labour standards:

- Freedom of association and collective bargaining (ILO C087 and C098),
- Non-discrimination (ILO C100 and C111),
- Prohibition of forced labour (ILO C29 and C105),
- Prohibition of the worst forms of child labour and minimum age (ILO C182 and C138)

Other ILO standards on relevant social risks:

- Occupational health and safety (ILO C155)
- Safety in the use of chemical substances (ILO C170)
- Payment of the statutory minimum wage (for a standard working week) (ILO C131)
- Hours of work (ILO C001)
- Social security (ILO C102)

The obligation to comply with the requirements extends to levels 1 and 2 of the supply chain. The individual levels of the supply chain are defined according to (BMI/Bitkom 2019)[36]:

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[28] Solutions for Hope Initiative; https://www.resolve.ngo/site-solutionsforhope/resources.htm, Version: 2020

[29] The ITSCI Programme, https://www.itsci.org/join-our-members/, Version: 2020

[30] Fairtrade Gold Standard, https://www.fairtrade-deutschland.de/produkte/gold/hintergrund-fairtrade-gold, Version: 2020

[31] Fairmined Standard Gold, https://fairmined.org/de/the-fairmined-standard/, Version: 2020

[32] Responsible Materials Standard, http://www.responsiblemineralsinitiative.org/, Version: 2020

[33] Conflict Free Tin Initiative, https://www.resolve.ngo/site-cfti/default.htm, Version: 2020

[34] The European Partnership for Responsible Minerals, https://europeanpartnership-responsibleminerals.eu/, Version 2020

[35] It is possible that other initiatives will be accepted after they have been investigated by the German Environment Agency. For this purpose, the applicant should provide information to the German Environment Agency on the type of initiative (organisational structure, goal, country, materials covered, type of support) that describe how the project helps to improve human rights and the relevant social and environmental conditions in and around the miningsite(s).

[36] BMI/Bitkom (2019), Procurement Agency of the Federal Ministry of the Interior & the German Association for Information Technology, Telecommunications and New Media, Joint Declaration on social sustainability in IT procurement in the public sector http://www.nachhaltige-beschaffung.info/SharedDocs/DokumenteNB/Verpflichtungserkl%C3%A4rung_ILO_BeschA_Bitkom_2019.pdf?__blob=publicationFile&v=3, version: 2020

- Level 1: the final production site[37] and, if only product finishing is carried out at the final production site, also their direct suppliers;
- Level 2: all direct suppliers to the production sites in level 1;

The essence of the occupational and social standards covered by these requirements must also be met even if the national law in a particular country has not ratified one or more of the ILO standards or they have not yet been implemented in national law.

Compliance verification

The manufacturer shall state the name and location of the production sites in level 1 in Annex 1.

The manufacturer shall declare compliance with the above-mentioned requirements for these production sites in Annex 1 by 01.01.2024 at the latest.

Certification in accordance with the following standards will be accepted (Annex 17):

- *the audit standard SA 8000[38]. It is not necessary to submit certificates to verify that any compliance issues that were identified have now been resolved for this audit standard.*
- *The audit standard RBA VAP Recognition Program[39] platinum/gold. It is not necessary to submit certificates to verify that any compliance issues that were identified have now been resolved for this audit standard. The audit standard RBA VAP Recognition Program silver is recognised, insofar as the final audit confirms that there were no priority findings related to the ILO standards promoted in the DE-UZ 219 Basic Award Criteria. Verification of compliance with this requirement can, for example, be provided by disclosing the detailed evaluation in the audit results with respect to the ILO standards promoted in the DE-UZ 219 Basic Award Criteria.*
- *Certificates from other initiatives may be approved upon application to the German Environment Agency. The German Environment Agency bases its approval on the criteria in the declaration issued by BITKOM and the Procurement Agency of the BMI.*
- *Alternatively, the applicant can verify compliance by submitting an audit report for the manufacturer of the devices from an RBA-approved auditor or an auditor accredited in accordance with SA 8000 in Annex 17. Or the report must be created by an independent testing institution accredited[40] according to ISO/IEC 17065 that can verify compliance with the above-mentioned requirements. The audit on which the report is based must not be more than 3 years old when the application is submitted.*

  The manufacturer of the devices is obligated to submit revisions of the verifications at regular intervals if the contents of his declaration have changed. The frequency at which revisions of the verifications need to be submitted is determined based on the assignment of the production sites to levels 1 and 2 according to the country-specific risk categories in the currently valid ranking for the SA8000 Country Risk Assessments Process, which is based on the World Governance Indicators (WGI). If the relevant production sites in levels 1 and 2 are in countries in risk category 1, a revision must be submitted on an annual basis. If the production sites in levels 1 and 2 are in countries in risk category 2, a revision must be

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[37] For used devices, the testing and refurbishing facility is to be regarded as the final production facility.

[38] SA8000® Standard, SA8000:2014, https://sa-intl.org/resources/sa8000-standard/, Version: 2020

[39] Responsible Business Alliance, Validated Assessment Program (VAP), http://www.responsiblebusiness.org/vap/about-vap/, Version: 2020

[40] Accreditation must be issued by an accreditation body who is a signatory of the "IAF Multilateral Recognition Agreement (MLA)". https://www.iaf.nu/articles/IAF_MLA/14. Version: 2020

submitted every 24 months. If the production sites in levels 1 and 2 are in countries in risk category 3, a revision must be submitted every 36 months. If any deficiencies are identified in the relevant revision or audit, a corrective action plan will be implemented. This includes an obligation for the applicant and relevant suppliers to provide corresponding information to RAL gGmbH and a six-month grace period for the correction of the deficiencies and the provision of supplemental verifications.

3.7 Product documents and user information

The documentation supplied with the devices (user manual, product documents) must include both technical specifications and environmental and health-related consumer information. This documentation must be made accessible to the user in electronic or printed form (preferably printed on recycled paper). Regardless from this, a printed summary with brief information on the installation must be supplied with the device.
Information on the device functions listed below, as well as instructions on the use of the office equipment with printing function, must be summarised in a separate information and data sheet and this must include the following points:

- A declaration on whether the device is intended for use by private final consumers,
- Information on the minimum proportion of PCR plastic according to 3.1.1.2,
- If applicable, information on the take-back system for the reuse of devices according to 3.1.1.4,
- Information on device take-back and environmental-friendly disposal at the end of the use phase according to 3.1.1.4,
- Instructions for proper handling of colourant/toner modules according to 3.2.3.6,
- Instructions on the take-back of used photoconductor drums according to **Fehler! Verweisquelle konnte nicht gefunden werden.**,
- Information on the take-back of modules and containers for colourants according to 3.1.2,
- If applicable, information on yields according to 3.1.3,
- Information on use of recycled paper and resource-saving paper handling (including information on duplex and N-up printing) according to 3.1.4,
- If applicable: Information on the typical service life and typical use conditions according to 3.1.5.1, on the availability of spare parts and exchange parts according to 3.1.5.3 and on repair options, as well as on the maintenance and cleaning of equipment according to 3.1.5.3 and 3.1.5.4,
- Instructions for proper device placement with regard to substance emissions according to 3.3.4,
- According to Paragraph 3.4 and the requirements stated in Appendix E-I to the Basic Award Criteria: information on electric power saving, device data related to electric power consumption such as power consumption in the individual operating modes, delay times for idle modes and recovery times from the electric power saving modes, as well as electric power consumption data according to Appendix E-M,
- Information on noise emissions and page throughputs according to 3.5,
- Information on the fact that the device has been awarded the Blue Angel ecolabel and a link to the website http://www.blauer-engel.de.

The information and data sheet must be made available in printed (preferably printed on recycled paper) or electronic form and must at least be written in German. The information and data

sheet must be enclosed with products offered and/or supplied with the Blue Angel ecolabel or a reference must be made to the electronic version (Annex 12). In addition, the contents of the information and data sheet must be published on the website where the respective device is presented by the distributor about 4 weeks after the device was placed on the market and after conclusion of the Contract on the Use of the Environmental Label. This can also be done by offering a link to this specific information and data sheet (e.g. "Information and data sheet for {device designation} according to the requirements of the Blue Angel ecolabel DE-UZ 219"). If the device is placed on the market in German-speaking countries, the distributor must publish the German version of the information and data sheet on the respective German product world page of the Blue Angel website. If the device is only distributed in non-German-speaking countries, an English version of the information and data sheet must be published on the respective English product page. Publication in German and English is also possible.

Compliance verification

The distributor shall submit the information and data sheet.
The distributor shall state in Annex 2 that this information and data sheet is enclosed with the products or that reference is made to the electronic version, that its contents will be published on the Internet around 4 weeks after the device was placed on the market and on the websites of Blue Angel (Your product category) before granting the Contract on the Use of the Environmental Label, and that the essential environmental and health-related information is contained in the detailed product documents (user manual or electronic media), and, if applicable, the distributor names the link providing access to this information.

3.8 Overview of possible future requirements

As part of the next revision of these Basic Award Criteria, it is anticipated that, amongst other things, the following aspects will be taken into account:

- Increasing the proportion of post-consumer recycled plastic in plastic parts and amending the compliance verifications;
- Evaluation of stricter requirements for take-back systems for the refurbishment and reuse of devices;
- Evaluation of an adjustment to the recovery times and harmonisation with the ENERGY STAR standard;
- Evaluation of more comprehensive exclusions of substances with certain hazard characteristics from device materials;
- Introducing the term "non-destructive disassembly";
- Evaluation of a rule on the emission of ozone;
- Review of stricter requirements for social criteria.

4 Applicants and Parties Involved

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

Parties involved in the award process are:

- RAL gGmbH to award the Blue Angel Environmental Label,
- the federal state being home to the applicant's production site,

- Umweltbundesamt (German Environmental Agency) which after the signing of the contract receives all data and documents submitted in applications for the Blue Angel in order to be able to further develop the Basic Award Criteria.

5 Use of the Environmental Label

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

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

Contracts on the Use of the Environmental Label are concluded to fix the terms for the certification of products under Paragraph 2. Such contracts shall run until December 31, 2027.
They shall be extended by periods of one year each, unless terminated in writing by March 31, 2027 or March 31 of the respective year of extension.
After the expiry of the contract, the Environmental Label may neither be used for labelling nor for advertising purposes. This regulation shall not affect products being still in the market.

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

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

Appendix B - M Products of identical construction – Definition and scope of testing

Separate publication in the ZIP folder of DE-UZ 219 in the folder Appendixes.

Appendix E - M Energy - measurement requirement, determing recovery times and specifications for the classification of idle modes

Separate publication in the ZIP folder of DE-UZ 219 in the folder Appendixes.

Appendix E - I Energy - User information

Separate publication in the ZIP folder of DE-UZ 219 in the folder Appendixes.

Appendix S - M Testing method for the determination of emissions from hardcopy devices

Separate publication in the ZIP folder of DE-UZ 219 in the folder Appendixes.