The German Ecolabel

BLUE ANGEL

Office Equipment with Printing Function (Printers and Multifunction Devices)

DE-UZ 239

Basic Award Criteria

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Version 1

The Environmental Label is supported by the following institutions:

Bundesministerium
für Umwelt, Klimaschutz, Naturschutz
und nukleare Sicherheit

The Federal Ministry for the Environment is the owner of the label, defines the fundamental guidelines for awarding the Blue Angel ecolabel and appoints the Environmental Label Jury.

Umwelt Bundesamt

The German Environment Agency with its specialist department for "Ecodesign, Eco-Labelling and Environmentally friendly Procurement" acts as the office of the Blue Angel ecolabel. It develops the technical criteria, including the required compliance verifications, in cooperation with relevant interest groups.

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, churches, young people and the German federal states.

RAL gGmbH

RAL gGmbH is the awarding body for the Environmental Label. It examines the applications submitted by companies for the use of the Blue Angel ecolabel and concludes the "Contracts on the Use of the Environmental Label". It also monitors correct use of the ecolabel.

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If you require further information, please contact:
RAL gGmbH
RAL UMWELT
Fränkische Straße 7
53229 Bonn
Tel: +49 (0) 228 / 6 88 95 - 190
E-mail: umweltzeichen@ral.de
www.blauer-engel.de

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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, the German Environment Agency and considering the results of hearings held with relevant interest groups conducted by RAL gGmbH, the Environmental Label Jury has set up these criteria for awarding the ecolabel (Basic Award Criteria). 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 ecolabel 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

Information and communications technology (ICT) equipment has become indispensable to companies and private households. Computers, office equipment with printing functions, telephones and network technology accounted for the largest share of ICT-related electricity consumption in Germany in 2025 – at around 47% or 15 TWh. Office equipment with printing functions consumed around 600 gigawatt hours of electricity in 2025, which was associated with approximately 106,000 tonnes of CO_2e.[1]
Office equipment with printing functions (printers and multifunction devices) that have been awarded the Blue Angel ecolabel consume considerably less electricity 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 (e.g. vacuum cleaners). 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 $3.5x10^{11}$ 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. When determining the test value for the particle count, both the amounts of particles released by common electrophotographic printing devices and the typical substances contained in these particles and their size ranges were taken into account. The IRK issued this recommendation in 2011. The technology used for these devices has advanced since

[1] VHK calculation as part of the German Environment Agency's eco-design project FKZ 3722373080, Dessau-Roßlau, 2025

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 and is thus significantly below the recommended test value.
A further environmental aspect is the possible noise pollution from printing devices used in a working environment. The Blue Angel sets out requirements here that lead to a reduction in noise pollution.
In addition, office equipment with printing functions 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 users, the manufacturers are required to provide a clearly defined list of spare parts including repair information such as instructions, illustrations or exploded-view drawings. Furthermore, the products must contain a minimum level of recycled plastic ("post-consumer recycled" = PCR plastic).
Last but not least, low-pollutant materials must be used in the plastic parts, inks and toners of devices that have been awarded the Blue Angel ecolabel to reduce the risks posed to the environment and human health.
The Basic Award Criteria also include requirements for the due diligence of companies in the sourcing of raw materials and support for local initiatives to promote responsible mining. Criteria regarding social sustainability in the manufacturing process have additionally been included. These criteria are designed to promote compliance with the 10 core conventions of the International Labour Organization (ILO) 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, the following benefits for the environment and health are stated in the explanatory box:

- Low energy consumption
- Low emissions and noise
- Design for recycling



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- geringer Energieverbrauch
- emissions- und lärmarm
- recyclinggerechte Konstruktion

1.4 Definitions

The following definitions apply when using these Basic Award Criteria.

User, manufacturer, distributor

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.

Manufacturer: A manufacturer is any natural or legal person who manufactures a new product or has a product manufactured, or makes a product fit for sale through remanufacturing or refurbishing/reconditioning, and who markets that product under its name or trademark.

Distributor: A distributor is any natural or legal person who makes a product available for distribution or use for the first time, whether in return for payment or free of charge, and irrespective of the marketing method.

Professional repairer[2]**:** A person or a company which provides services for the professional repair and maintenance of office equipment with printing functions.

Device designs

New devices: A device produced by an original equipment manufacturer using new parts. Reused parts or parts made from recycled materials can be used.

Remanufactured devices: Within the framework of these Basic Award Criteria, devices that have been remanufactured according to British Standard BS 8887-220:2010.[3]

Refurbished/reconditioned devices: Within the framework of these Basic Award Criteria, devices that have been refurbished according to British Standard BS 8887-240:2011.[4]

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 are not included in the base unit.

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

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

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

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.

Delivered state: 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.

Professional devices

[2] See Regulation (EU)2019/2021 – laying down ecodesign requirements for electronic displays
[3] The aim is to harmonise the terminology with ISO/IEC TS 22983, which is due to be published shortly.
[4] The aim is to harmonise the terminology with ISO/IEC TS 22983, which is due to be published shortly.

A printer or multifunction device marketed as intended for producing marketable printed products, with the following features (according to the definition in ENERGY STAR 3.2):

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.

Digital Front End (DFE) (according to ENERGY STAR): A functionally integrated server that hosts other computers and applications and acts as an interface to printing devices, whereby it provides greater functionality to the printing devices. The DFE can be powered via the base unit or via its own power supply unit. The definition of the DFE corresponds to ENERGY STAR 3.2.

Primary functions

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

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.

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

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

Printing and printing technologies

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 (Method for measuring the productivity of digital printing devices) and specified as an average ESAT value in simplex printing in office operation. The S_M value is an integer; the ESAT value[5] should be rounded down.

[5] 1 set + 30 second test; $ESAT_{30\ sec}$

When determining this value for electrophotographic devices, the printing test pattern according to ISO/IEC 10561 (Method for measuring throughput, "Dr. Grauert Letter") or so-called "continuous printing" may also be used.

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 (Method for measuring digital printing productivity). The S_F value is an integer; the ESAT value[5] should be rounded down.

When determining this value for electrophotographic devices, the printing test pattern according to ISO/IEC 10561 (Method for measuring throughput, "Dr. Grauert Letter") or so-called "continuous printing" may also be used.

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.

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.

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.

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).

Device parts

Photoconductor drum: A light-sensitive drum in a laser printer that creates the printed image through electrical charging and controlled exposure and transfers the toner onto the paper.

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.

Accessories: 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.

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.

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.

Containers for colourant: Containers for colourants such as toners (e.g. toner bottles), inks (e.g. ink tanks), etc.
Assemblies: Assemblies consist of at least two components that are joined together in a force-fit or form-fit manner.
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.
Chassis: The chassis is the supporting component of the device.
Electric/electronic assemblies: Electric/electronic assemblies include at least one electronic or electric component.
Mechanical parts: Mechanical parts are not included in electric/electronic assemblies and perform mechanical or optical functions (except for the casing and chassis).
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 safety or legal reasons.
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.

Materials and operating materials
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.

Colourants
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).

Substance
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 (See EU REACH Regulation, Article 3, and EU CLP Regulation, Article 2).
Mixture
Mix, mixture or solution composed of two or more substances (See EU REACH Regulation, Article 3, and EU CLP Regulation, Article 2).
Post-consumer recycled materials (PCR plastic)
Recycled plastic sourced from materials disposed of by households, commercial and industrial organisations or institutions who are the users of products.

Operating modes

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

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).
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).

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 3.2).

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.

Time-related definitions

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.

Delay 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.

Recovery 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 is 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.

Power consumption

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.

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 3.2 method.
Production energy (E_P)
Production energy (E_P) is the electricity consumption required by professional devices to print one page, stated in watt-hours per page.
The E_P calculation method is based on ENERGY STAR 3.2, Paragraph 3.4.3.
Ready Mode Power (electricity consumption in ready mode, P_{RM})
Ready Mode Power (P_{RM}) is the electricity consumed by professional devices in Ready Mode, stated in watts. The P_{RM} calculation method is based on ENERGY STAR 3.2, Paragraph 3.4.4.

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/m²,
- 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 requirements of the Basic Award Criteria for the modules and containers for colourants, as well as for the colourants themselves, apply to the unmodified original equipment of the products marked with the environmental label from the respective distributor, including the materials recommended by the distributor in the product documents. They also apply to remanufactured and refurbished/reconditioned devices that received a contract via the Blue Angel as new devices and have been made fit for sale according to the criteria described here in Paragraph 3.9.

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 volts) are also excluded from the scope of these Basic Award Criteria.

3 Requirements

Criteria 3.2 to 3.7 apply to applications for new devices. Criterion 3.9 applies to applications for the Blue Angel for remanufactured and refurbished/reconditioned devices. Requirements 3.1, 3.2.7.3, 3.8.3 and 3.10 apply in the same manner to new devices and to remanufactured and refurbished/reconditioned devices.

3.1 Product description

The requirements of the Environmental Label partly distinguish between devices that are intended for use in a commercial environment and devices that are intended for use by private

end users, between professional and non-professional devices according to ENERGY STAR and between electrophotographic and inkjet devices.
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 Annex 2 to the application whether the device is intended for use in a commercial environment or for use by private end users, whether it is a professional or non-professional device according to ENERGY STAR, what printing technology is used and whether colour or monochrome printing is possible.
The distributor will also include this information in the information and data sheet (Annex 12).

3.2 Resource conservation

The following criteria include requirements that contribute towards resource conservation. This includes criteria concerning design for recycling, the use of post-consumer recycled materials, the take-back of photoconductor drums and modules and containers for colourants, the ink/toner yield of modules/containers provided with the device, resource-conserving paper handling, longevity and packaging.

3.2.1 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:

3.2.1.1 Requirements regarding design for disassembly

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

3.2.1.2 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 3.2.1.4.		
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 3.2.1.4. 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 > 25g with a flat surface of at least 200 mm² are marked in accordance with EN/ISO 11469 (Generic identification and marking of plastics products) with consideration to ISO 1043:3 (Symbols and abbreviated terms - Part 3: Plasticizers)	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 and reused plastics or a combination of both is stated in the information and data sheet, calculated as a percentage by weight of the total plastic and indicated in intervals of 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.		

3.2.1.3 Requirements concerning the 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 its 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 according to DIN 33870-1 and 33870-2 (Requirements and tests for the preparation of refilled toner modules for electrophotographical printers, copiers and facsimile machines) and refurbished ink modules and containers according to DIN 33871-1 (Preparation of refilled inkjet print heads and inkjet tanks for inkjet printers) is not prevented by structural, software-based or other measures, and the following range of functions is available, if originally present: display of the page count, display of the toner/ink level. All changes to the toner module, toner container, ink module or ink container by third parties are their responsibility.	Entire unit	Must
5	Modules for colourants can be refurbished	Modules for colourants, except containers for colourants	Must
	Explanation: Reuse must not be precluded by constructive measures.		

Compliance verification

The applicant shall declare compliance with the requirements in Paragraphs 3.2.1.1, 3.2.1.2 and 3.2.1.3 in writing in Annex 1 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 heavier than 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 (Annex 12).

3.2.1.4 Take-back of devices for reuse

A system for the take-back of devices for reuse must be demonstrated. The aim is to achieve the highest possible reuse level in accordance with the waste hierarchy[6]. 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 its own activities, the exemptions to the requirements concerning material selection for recyclability described in Paragraph 3.2.1.2 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) for all of the countries in which certification is sought. The distributor shall also submit the information and data sheet in this context.

3.2.2 Use of PCR plastics

3.2.2.1 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.

PCR materials sourced from another process other than recycling according to the type of material (e.g. chemical recycling of plastics) are not permitted.

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 will be introduced gradually.

Devices must contain at least the following proportions of PCR plastics (the following are excluded: printed circuit boards, labels, cable, plug, electronic components and optical components):

- From 01/01/2027 for devices that are already certified with the Blue Angel or for which an application is made for the first time: at least 5% PCR plastics or 5% reused plastics or a combination of both, measured against the total plastic mass;
- For devices for which an application is made for Blue Angel certification for the first time from 01/01/2029: at least 10% PCR plastics or 10% reused plastics or a combination of both, measured against the total plastic mass;
- For devices for which an application is made for Blue Angel certification for the first time from 01/01/2031: at least 15% PCR plastic or 15% reused plastics or a combination of both, measured against the total plastic mass.

[6] Prevention, preparing for reuse, recycling, energy recovery, disposal

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 applicant shall declare compliance with the requirements in Annex 1. 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 supplier (letter from the supplier) or its 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 are considered to be of a temporary nature.
Additives or fillers are not considered to be recycled plastic, except when the additives or fillers were sourced from recycled source material.

3.2.2.2 Origin of PCR plastics (optional)

The post-consumer recycled materials (PCR materials) should come from certified sources that can clearly verify their origins. In particular, the origin of the waste must be stated.

The applicant shall verify the origin and composition of the recycled plastics used in the product by submitting an appropriate certificate (including the report). The certificate must clearly indicate that the materials are PCR recycled plastic.
The following certifications are accepted:

- RecyClass – Recycling Process[7]
- Global Recycled Standard (GRS)[8]
- Environmental Claim Validation Procedure (ECVP) for Recycled Content (UL ECVP 2809-2) in combination with the UL Environmental Claim Validation Procedure (ECVP) for Defined Source Content (UL ECVP 2809-1)[9] with the following restrictions: The certification must be completed according to Section 6.4 "Recycled Plastics" in UL ECVP 2809-2, which guarantees compliance with the guidelines in EN 15343. Only the "Chain of Custody" (CoC) models "identity preserved", "segregated", "controlled blending" defined in

[7] https://recyclass.eu/get-certified/recycled-plastic/#1
[8] https://www.scsglobalservices.com
[9] https://www.ul.com/services/environmental-claim-validation-ecv

ISO 22095 (Chain of custody – General terminology and models) are permitted. The CoC models "mass-balance" and "book and claim" defined in ISO 22095 (Chain of custody – General terminology and models) are expressly not permitted.

If other certification schemes are used, compliance with EN 15343:2007[10] (Plastics recycling traceability and assessment of conformity and recycled content) and equivalence with one of the certification schemes mentioned must be demonstrated and will be verified by the German Environment Agency.

Compliance verification

The origin and composition of the PCR plastics shall be confirmed by the applicant in Annex 1 and verified in the form of a certificate (including a report) in accordance with the EuCertPlast certification scheme, the RecyClass certification scheme (for "Recycling Process"), the Global Recycled Standard (GRS) or an equivalent certification scheme according to EN 15343:2007 (Plastics recycling traceability and assessment of conformity and recycled content) in Annex 5b.
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 are considered to be of a temporary nature.
Additives or fillers are not considered to be recycled plastic, except when the additives or fillers were sourced from recycled source material.

3.2.3 Take-back of photoconductor drums

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 the country where the product is being offered for sale using the Blue Angel ecolabel.

Compliance verification

The distributor shall declare in Annex 2 that replaced drums will be taken back and recycled. The distributor shall state the usage or recycling method used (Annex 11) and refer to the take-back system in the information and data sheet (Annex 12; see also Paragraph 3.10).

3.2.4 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

[10] Corresponds to the German version DIN EN 15343:2008

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.
The distributor shall publish on its website the respective proportions of modules and containers for colourants from voluntary collection that are sent for reuse and for material recycling. A breakdown according to models and Blue Angel-certified products is not necessary.

Compliance verification

The distributor shall declare compliance with the requirements in Annex 2 and document the 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). The distributor shall indicate the published proportions, stating the URL (Annex 12; see also Paragraph 3.10).

3.2.5 Ink/toner yield of modules/containers provided with the device (devices for private use)

In the case of devices intended for use by private end users, the ink/toner yield of modules/containers provided with the device must be indicated according to the following ISO standards:

- ISO/IEC 19752 (Method for the determination of toner cartridge yield for monochromatic electrophotographic printers and multi-function devices that contain printer components),
- ISO/IEC 19798 (Method for the determination of toner cartridge yield for colour printers and multi-function devices that contain printer components), and
- ISO/IEC 24711 (Method for the determination of ink cartridge yield for colour inkjet printers and multi-function devices that contain printer components)

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 end users, the distributor shall declare compliance with the requirements in Annex 2 and 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 3.10).

3.2.6 Resource-conserving handling of paper

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.

3.2.6.1 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 (Printing and business paper - Requirements for copy paper for dry toner imaging processes). 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.

3.2.6.2 Duplex printing and copying

For **all devices** with a speed higher than stated in Table 4, 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	P > 19
Monochrome	P > 24

An automatic duplex unit must always 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 12 (Information and data sheet) (see ENERGY STAR 3.2).

3.2.6.3 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 the resource-conserving handling of paper (Annex 1) and the distributor shall submit the information and data sheet (Annex 12; see also Paragraph 3.10).

3.2.7 Longevity (devices for private use)

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 end users that have been certified with the Blue Angel.

3.2.7.1 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.

3.2.7.2 Exchange parts

The devices must be designed in such a way that all necessary exchange parts can be replaced by users themselves.

3.2.7.3 Repair options and spare parts/exchange 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 7 years following the termination of production and, for remanufactured and refurbished/reconditioned devices made fit for sale, for 7 years after the last unit of the model has been placed on the market (see Table 5), and that the user is informed about this availability of spare/exchange parts. Other parts which normally exceed the average service life of the product do not need to be made available as spare parts/replacement 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). At the same time, registered professional repairers or users must be given access to the required spare parts/replacement parts according to Table 5 and repair information (e.g. instructions, illustrations or exploded view drawings).

The spare/exchange parts must be made available at reasonable prices by the distributor themselves or by third parties commissioned by the distributor.
The spare/exchange parts and their prices (excluding taxes and delivery costs) in euros must also be published on a freely accessible website, together with the organisation to which the order for spare/exchange parts should be sent.
The distributor must ensure that

- the spare/exchange parts are shipped by the manufacturers within ten working days of receipt of the order by the aforementioned organisation during the first five years,
- the spare/exchange parts are shipped by the manufacturers within fifteen working days of receipt of the order by the aforementioned organisation during the remaining two years.

This requirement does not apply to unforeseeable delays to deliveries caused by force majeure (e.g. storms, pandemics, etc.).[11]

In the case of remanufactured and refurbished/reconditioned devices made fit for sale, 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 are maintained for at least 7 years after placing the devices on the market. This information must be provided to users via a corresponding note in the information and data sheet and on the distributor's website.

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

	Spare/exchange parts	
	For users	**For professional repairers[12]**
Electrophotographic devices	Excess toner reservoirs Paper cassettes External power supplies/power cable	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 External power supplies/power cable Control circuit boards Control panel

3.2.7.4 Consumables

The distributor undertakes to make sure that the consumables (incl. ink and toner containers) necessary for the usability of the devices are available for at least 7 years following the termination of production of the devices.

3.2.7.5 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

[11] In individual cases, the distributor may cite additional grounds to RAL.

[12] The distributor must provide information on its 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.

maintenance intervals, as well as instructions on the proper completion of the cleaning and maintenance work by the user.

Compliance verification (3.2.7.1 to 3.2.7.5)

For devices intended for use by private end users, the distributor shall declare compliance with the requirements regarding longevity in Annex 2 and provide the relevant product and service information, as well as the information and data sheet (Annex 12; also see Paragraph 3.10).
The applicant shall declare compliance with the requirements on exchange parts in Annex 2 to the contract. The applicant shall make reference to freely accessible guide prices (excluding taxes and delivery costs) in euros for the spare parts and for the product on its website for 3 months after the market launch of the product and refer to the relevant URLs in Annex 2, including the prices (excluding taxes and delivery costs) for any fixing elements and tools supplied with the spare part (if applicable). The URL will be stated in the information and data sheet (Annex 12).

3.2.8 Packaging

The plastics used for the packaging of the devices are not permitted to contain any halogenated polymers or – for devices under 5kg – any polystyrene (EPS). The latter applies to devices certified with the Blue Angel for the first time on or after 01/01/2029.
The plastics used must be marked in accordance with the currently valid version of Annex 5 of the German Packaging Act (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 (moulded parts): 40%
- Wound tubes: 90%

Compliance verification

The distributor shall declare compliance with the requirements for plastic (Annex 2). For paper and cardboard, the distributor shall declare that the packaging materials used contain at least the stated proportions of recovered fibres (Annex 2).

3.3 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.

Observance of European chemical law and the standard rules for the sector is a prerequisite, irrespective of the sales area (especially the REACH Regulation Annex XVII, POP Regulation Annex I, CLP Regulation, RoHS Directive and the Biocidal Products Regulation)[13].

[13] If substance restrictions from other regulations also apply to the specific product, these also need to be observed.

3.3.1 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 are exempt from this rule:

- Fluoroorganic additives (e.g. anti-dripping agents), including fluorinated polymers such as PTFE, used to improve the physical properties of plastics, provided that they do not exceed a proportion of 0.5 per cent by weight.
- Plastic parts weighing 25g or less (however, exception not valid for control panel buttons). However, in accordance with EU chemicals legislation, they must not contain PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenyl ethers) or chlorinated paraffins.[14]
- Special plastic parts located close to heating and fuser elements. However, in accordance with EU chemicals legislation, they must not contain PBBs, PBDEs or chlorinated paraffins.
- Large-sized plastic parts that are verifiably reused and are marked according to 3.2.1.2, Table 2, no. 7. However, in accordance with EU chemicals legislation, they must not contain PBBs, PBDEs or chlorinated paraffins.

The halogenated polymers and added halogenated organic compounds used in plastic parts heavier 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	Hazard statement
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.[15]		

The stated requirements also apply to any recycled materials used.

Compliance verification

The manufacturer shall declare compliance with the requirements in Annex 1. The manufacturer shall submit a written declaration 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. If it is determined that fluorinated plastics in casings or casing parts exceed a mass fraction of 0.5 per cent, a transitional period may be agreed with the German Environment Agency, provided that the substance does not fall under the restrictions

[14] Maximum PBB and PBDE content in accordance with EU RoHS Directive (2011): 0.1% by weight; max. content of chlorinated paraffins in accordance with EU POP Regulation (2019): 0.15% by weight

[15] http://echa.europa.eu/en/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.

of other provisions in this paragraph and the German Environment Agency approves a substitution plan for the fluorinated plastics concerned.
The manufacturer also undertakes to request that the supplier of casing plastics states the chemical designation (CAS no.) of the halogenated polymers and added halogenated organic compounds used. They can be reported in confidence to RAL gGmbH. The following applies to all halogenated polymers and added halogenated organic compounds, except for flame retardants: If a supplier is not willing to pass on CAS numbers to RAL gGmbH due to business secrets, a document issued by the manufacturer, in which the supplier is requested to provide CAS numbers, shall be considered verification of conformity (also 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 transitional period can be agreed with the German Environment Agency.

3.3.2 Hazardous substances in all parts of the base unit: Material requirements for plastics

3.3.2.1 Hazardous substances in all parts of the base unit: General requirements

Plastics containing bromine and chlorine are not permitted in casings/casing parts and in any part of the base unit.

The following are exceptions to this rule:

- Plastic parts weighing < 25g;
- Plastic parts ≥ 25g may contain ≤ 0.1% by weight chlorine and ≤ 0.1% by weight bromine, based on the homogeneous content;
- Plastic parts ≥ 25g that contain ≥ 25% post-consumer recycled material (PCR) may contain ≤ 0.5% by weight chlorine and ≤ 0.5% by weight bromine, based on the homogeneous content;
- Electronic components on printed circuit boards;
- Printed circuit boards, cables and wires, fans, plastic parts (excluding external casings) that contain chlorinated or brominated flame retardants in order to comply with the statutory fire safety standards (e.g. UL 94 V0, V1, V2, 5 VA or 5VB), for which other, non-halogenated flame retardants cannot be used, in order to achieve the required material properties and performance characteristics. In this case, the plastic part and the flame retardant used or its flame retardancy classification (e.g. the code numbers for flame retardants specified in ISO 1043:4) must be reported to RAL.

Compliance verification:
a) The manufacturer shall declare compliance with the requirements in Annex 1 and provide a list of all plastic parts in the product weighing ≥ 25g, as well as stating which of these parts fall under the exceptions for this criterion.

b) The following documents can be provided to demonstrate that the limit values are observed:

i. Test data showing that all plastic parts, or the resin or granulate matter used to manufacture the part, weighing ≥ 25g, comply with the limit values specified in the criterion when tested using appropriate test method(s). The permitted test methods include IEC 62321-3-1 and IEC

62321-3-2 (Determination of certain substances in electrotechnical products) and EN 14582 (Characterization of waste - Halogen and sulfur content - Oxygen combustion in closed systems and determination methods). The laboratory must be accredited for the test methods used.

If data on resin or granulate matter is used, a declaration from the component supplier is required, stating that no brominated or chlorinated substances have subsequently been added to the plastic parts in the products, or

ii. Evidence of the implementation of a conformity assurance process, demonstrating conformity with this criterion for plastic parts ≥ 25g through effective control of the supply chain, or

iii. Evidence of technical documentation and implementation according to EN IEC 63000:2018 (Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances), demonstrating that the product meets the substance restriction requirements of this criterion.

c) For all plastic parts with a proportion of PCR of ≥ 25%: Supplier declaration(s) in which the parts are identified and it is confirmed that the proportion of PCR in these parts is ≥ 25%.

For all plastic parts weighing ≥ 25g, for which the manufacturer states that they contain brominated or chlorinated flame retardants to fulfil binding fire safety standards (e.g. UL 94 V0, V1, V2, 5VA or 5VB), technical documents from the manufacturer or supplier declarations must be submitted that
(a) identify the parts and the necessary flammability standards, and
(b) confirm that the parts contain chlorine or bromine for the purpose of flame retardancy and that other halogen-free flame retardants cannot be used.
The manufacturer also undertakes to report the chemical designation (CAS no.) of the flame retardants used to RAL gGmbH; he may arrange for this to be sent in confidence by the suppliers of the plastics (Annex 5). Alternatively, the manufacturer states the classification of the flame retardants by entering them in Annex 4.

3.3.2.2 Hazardous substances in all parts of the base unit: Material requirements regarding PFAS

The manufacturer must state the PFAS applications currently used in the product in order to compile information for future substitution.

Compliance verification

In the PFAS annex, the manufacturer shall document the PFAS applications in the product for RAL.

3.3.3 Hazardous substances in printed circuit boards

In accordance with EU chemicals legislation, the base material for the printed circuit boards must not contain PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenyl ethers) or chlorinated paraffins.[16]

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.

3.3.4 Restriction of the use of heavy metals

Photoconductor drums must not contain selenium, lead, mercury or cadmium or any of their compounds as constituent components.

No substances may be added to toners and inks which contain mercury, cadmium, lead, nickel or chromium VI compounds as constituent components.
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 in Annex 1 and confirm, by submitting a declaration from the device manufacturer or the photoconductor drum manufacturer or the ink or toner manufacturer, that no selenium, lead, mercury or cadmium or their compounds are contained in the photoconductor drum as constituent components and no mercury, cadmium, lead, nickel, or chromium VI compounds are contained in inks or toners as constituent components and that production-related contaminations by heavy metals such as cobalt, nickel or organotin compounds have been minimised.

3.3.5 Hazardous substances in colourants

3.3.5.1 Restriction of the use of hazardous substances

Colourants such as toners, inks, solid inks, etc. must not contain substances or substances in added mixtures as constituent components

a) that are identified as particularly alarming under the Chemicals Regulation REACH (EC) No 1907/2006 and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "list of candidates")[17].

[16] Maximum PBB and PBDE content in accordance with EU RoHS Directive (2011): 0.1% by weight; max. content of chlorinated paraffins in accordance with EU POP Regulation (2019): 0.15% by weight

[17] List of candidates from the REACH Regulation (EC) No. 1907/2006: https://www.echa.europa.eu/en/candidate-list-table. The version of the list of candidates at the time of application is valid. 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.

Colourants such as toners, inks, solid inks, etc. must not contain substances or substances in added mixtures that meet the following classification criteria if their quantities exceed the limit values stated in Appendix B Table 14. These are generally concentration threshold values, above which the substances must be shown on the safety data sheet for the printing inks, inks and toners:

b) Substances that according to Regulation (EC) No. 1272/2008 (CLP Regulation) have been classified in the following hazard categories or which meet the criteria for such classification[18]:
   - acutely toxic (poisonous) in categories Acute Tox. 1, Acute Tox. 2 or Acute Tox. 3
   - toxic to specific target organs in categories STOT SE 1, STOT SE 2 or STOT RE 1, STOT RE 2, Asp. Tox. 1
   - carcinogenic in categories Carc. 1A, Carc. 1B or Carc. 2
   - germ cell mutagenic in categories Muta. 1A, Muta. 1B or Muta 2
   - reprotoxic (teratogenic) in categories Repr. 1A, Repr. 1B or Repr. 2, Lact.
   - endocrine disruptors with a negative effect on human health in the categories ED HH 1 or ED HH 2
   - endocrine disruptors with a negative effect on the environment in the categories ED ENV 1 or ED ENV 2
   - persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) characteristics
   - persistent, mobile and toxic (PMT) or very persistent, very mobile (vPvM) characteristics
   - hazardous to water in the categories Aquatic Acute 1, Aquatic Chronic 1, Aquatic Chronic 2, Aquatic Chronic 3 or Aquatic Chronic 4
   - supplementary hazard characteristics and labelling elements of categories EUH029 (contact with water liberates toxic gas), EUH031 (contact with acids liberates toxic gas), EUH032 (contact with acids liberates very toxic gas) or EUH070 (toxic by eye contact).

The hazard statements (H statements) that correspond to the hazard categories can be found in Table 14 in Appendix B.

If there is any indication of significant contamination that causes the abovementioned threshold values to be exceeded, RAL must be informed of these substances and mixtures and a substitution programme to prevent contaminated substances and mixtures must be submitted.

The following exceptions to the requirements apply:

- Toner:
  - As an exception to the Aquatic Acute 1 requirement, a threshold of 1.0% is established for toner.
  - As an exception to the STOT RE 2 requirement, a threshold of 10% is established for HMDS-treated silica classified as STOT RE 2 in toners.
- Inks:
  - As an exception to the Aquatic Acute 1 requirement, a threshold of 1.0% is established for surfactants and colourants in inks.

[18] The current version of the CLP Regulation (EC) No 1272/2008: https://www.reach-clp-biozid-helpdesk.de/DE/CLP/Rechtstexte/Rechtstexte_node.html at the time of application is valid.

- As an exception to the Aquatic Chronic 2 requirements, a threshold of 5.0% is established for surfactants and colourants in inks.
- As an exception to the Aquatic Chronic 3 and 4 requirements, a threshold of 10.0% is established for surfactants and colourants in inks.
- As an exception to the vPvM requirements, a threshold of 15.0% is established for substances used as solvents, colourants and surfactants in inks.

Compliance verification

The manufacturer shall declare compliance with the requirements in Annex 1 and enclose a declaration from the device manufacturer (if they manufacture the ink or toner) or the manufacturer of the ink or toner (Annex 6a) with the application. Safety data sheets according to Article 31 and Annex II of the REACH Regulation (EC) No. 1907/2006 for all of the colourants must be enclosed with the application (Annex 6b). The safety data sheets may not be older than 2 years. Provided that the safety data sheet for the toner does not show a negative AMES test, the test result for this test must be given separately (Annex 6c).
If a substitution problem for permitted substances should arise due to changes to the candidate list at short notice, a transitional period can be agreed with the German Environment Agency. If contamination causes the threshold values to be exceeded, the manufacturer shall inform RAL of these substances or mixtures and submit a substitution programme to prevent contaminated substances and mixtures (Annex 6d).

3.3.5.2 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 (EC) 1907/2006 (REACH Regulation), Annex XVII, Appendix 8[19].

Compliance verification

The applicant shall declare compliance in Annex 1 and verify compliance with the requirement by submitting a declaration from the device manufacturer or the manufacturer of the ink or toner (Annex 6a) and the safety data sheet sent according to Paragraph 3.3.4.1.

3.3.5.3 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 of approved substances for product type 6 is rejected after an evaluation has been completed, the use of this substance is no longer permitted. The requirements according to Paragraph 3.3.4.1 also apply.

[19] According to amending Regulation (EC) No 552/2009 of 22 June 2009

Compliance verification

The applicant shall declare compliance in Annex 1 and verify compliance with the requirement by submitting a declaration from the ink manufacturer (Annex 6a), stating the biocide used, and the safety data sheet sent according to Paragraph 3.3.4.1.

3.3.5.4 PFAS in colourants

The manufacturer excludes the use of the following PFAS in its colourants: perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluorohexanesulfonic acid (PFHxS), perfluorinated carboxylic acids (C9–C14 PFCAs) and their salts. For other PFAS that may be used in colourants, the manufacturer lists these PFAS and their application.

Compliance verification

The applicant shall declare compliance in Annex 1 and verify compliance with the requirement by submitting a declaration from the colourant manufacturer (Annex 6a) and shall enclose – where applicable – a list of the other PFAS used and their applications as Annex 6e. Alternatively, Annex 6a/e can be submitted to RAL in confidence by the applicant or the manufacturer of the colourant.

3.3.5.5 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 devices 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 3.10).

3.4 Substance emissions

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 (particles per 10 min).
The emission rates are determined according to Appendix S-M to the Basic Award Criteria during the standby phase[20] 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 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 standby 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 standby and print phases in Table 7 consider, from a precautionary perspective, the influence of the standby and print phase on indoor air quality on a proportionate basis.

3.4.1 Electrophotographic devices

Electrophotographic devices are tested for emissions of volatile organic compounds in a standby 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[21]. The predominant number of particles emitted by electrophotographic devices lies within this particle size range.

The emission rates in the standby and print phases must be determined and recorded in accordance with the test methods described in Appendix S-M to the Basic Award Criteria. They must not exceed the following values (Table 7):

Table 7: 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**
Standby phase Desktop devices	TVOC*	1.0	1.0
Standby phase Floor-mounted devices, device volume > 250 l	TVOC*	2.0	2.0
Print phase (= standby + print phase)	TVOC*	10.0	18.0
	Benzene	< 0.05	< 0.05

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

(All values in mg/h, except for particle emissions)		Monochrome printing	Colour printing
	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	$PER_{10\ PW}$ (number of particles/10min)**	2.5×10^{11}	2.5×10^{11}

* Please see the list of volatile organic compounds (TVOC) which must be considered when measuring emissions from office equipment with printing functions (see Appendix S-M, Paragraph 4.5 VOCs)
** Particle emission rate

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 immediately if the toner type is changed and a test report using the new toner type must be submitted.
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:
Particle emissions are measured as the emitted particle number concentration ($PER_{10\ PW}$). 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.

Compliance verification

The manufacturer shall declare compliance in Annex 1 and 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 3.4.1 and 3.4.2 is to be carried out in a laboratory accredited for the

parameters. Existing accreditations by the Bundesanstalt für Materialforschung und -prüfung (Federal Institute for Materials Research and Testing) are valid until 31/12/2027.

3.4.2 Inkjet devices

TVOCs must be determined for inkjet devices on the basis of the work instructions in Appendix S-M to the Basic Award Criteria 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 in the print phase must be determined and recorded in accordance with the test methods described in Appendix S-M. They must not exceed the following values (Table 8):

Table 8: Permissible test values for emission rates determined according to Appendix S-M for inkjet devices

(All values in mg/h)		**Monochrome printing**	**Colour printing**
Standby phase Desktop devices	TVOC*	1.0	1.0
Standby phase Floor-mounted devices with device volume > 250 l	TVOC*	2.0	2.0
Print phase (= standby + print phase)	TVOC*	10.0	18.0
	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 functions (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 with the new ink type.

Compliance verification

The manufacturer shall confirm compliance in Annex 1 and 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 3.4.1 and 3.4.2 is to be carried out in a laboratory accredited for the parameters. Existing

accreditations by the Bundesanstalt für Materialforschung und -prüfung (Federal Institute for Materials Research and Testing) are valid until 31/12/2027.

3.4.3 Information for users 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 3.10).

3.4.4 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.

3.5 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 (see definitions in Paragraph 1.4):
For non-professional devices (for private or commercial use):

- Typical energy consumption (TEC_M),
- Sleep mode,
- Maximum delay times,
- Maximum values for recovery times, and
- Off mode.

For professional devices:

- Ready Mode Power (electricity consumption in ready mode, P_{RM}),
- Production Energy (E_P)
- Sleep mode,
- Off mode.

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 delivered state, the device must meet all of the requirements stated in Paragraph 3.5.

3.5.1 Electricity consumption according to ENERGY STAR 3.2

The TEC_M value for **non-professional office equipment** with printing functions for private or commercial use must comply with the maximum TEC_{Mzul} value of ENERGY STAR 3.2, 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 3.2).

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 3.2 Paragraph 3.3.

The calculation of "Production Energy (E_P)" for **professional devices** must be carried out in accordance with ENERGY STAR 3.2 Paragraph 3.4.

"Production Energy (E_P)" for professional devices must be calculated according to equation 10 of ENERGY STAR 3.2 and may not exceed the maximum permitted energy consumption stated in Table 9. For devices equipped with a Digital Front End (DFE) during testing, the energy consumed by the DFE must be added to the energy consumed by the main product to determine conformity, as specified in ENERGY STAR 3.2.

Table 9: Permitted energy consumption of professional devices

	Monochrome printing	**Colour printing**
Maximum "Production Energy (E_P)" (Wh/image)	0.42	0.67

The "Ready Mode Power (P_{RM})" of professional devices must be calculation according to equation 14 of ENERGY STAR 3.2 and may be a maximum of 900 W over the measured time.

Compliance verification

The manufacturer shall confirm compliance in Annex 1 and submit all of the device data in Annex 8a that are decisive for applying the requirements: Type of device (professional or non-professional device, printer or multifunction device, monochrome printing device or colour printing device), page throughput and the electricity consumption values for the device.
The manufacturer shall submit a measurement report (Annex 8c) that verifies compliance with the values stated in Annex 8a. This should include at least the "Data Collection Worksheet" for the ENERGY STAR standard. Measurements carried out by testing laboratories accredited according to ISO/IEC 17025 (General requirements for the competence of testing and calibration laboratories) 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).

3.5.2 Sleep mode

3.5.2.1 Maximum power consumption

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

Compliance verification

The manufacturer shall confirm compliance in Annex 1 and 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) that verifies compliance with the values stated in Annex 8a. Measurements carried out by testing laboratories accredited according to ISO/IEC 17025 (General requirements for the competence of testing and calibration laboratories) 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).

3.5.2.2 Maximum delay times

In its delivered state, non-professional office equipment with printing functions must be configured to automatically enter an electric power saving mode after a defined delay time. Typically, these devices have multiple electric power saving modes. The requirements do not apply to professional devices, as these are included in the measurement for professional devices according to ENERGY STAR 3.2.

The following requirements with respect to delay times apply to the sleep mode (according to the definition in Paragraph 1.4), which has a maximum power consumption of 2 watts, or 3 watts for devices with a wireless network access point (see Paragraph 3.5.2.1). 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: Maximum configurable delay times t_{iA} before switching to sleep mode

All devices with a page throughput S_M of	**Minutes**
> 0 … 30 pages per minute	60
> 30 pages per 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

S_M	MFD	Printer
21 – 30	45	30
31 - 50	45	45
> 51	45	45

Compliance verification

The manufacturer shall confirm compliance in Annex 1 and state the default and maximum adjustable delay times in Annex 8a. The manufacturer shall submit a measurement report (Annex 8b) that verifies compliance with the values stated in Annex 8a. Measurements carried out by testing laboratories accredited according to ISO/IEC 17025 (General requirements for the competence of testing and calibration laboratories) 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).

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

Non-professional office equipment with printing functions must return to ready mode from idle modes within the defined maximum times. These requirements do not apply to professional devices.

The recovery times must be determined for the idle modes that 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} (minutes)	t_{3B} (minutes)
> 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 t_{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

	t_{2R} (seconds)	t_{3R} (seconds)
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 confirm compliance in Annex 1 and 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) that verifies compliance with the values stated in Annex 8a. Measurements carried out by testing laboratories accredited according to ISO/IEC 17025 (General requirements for the competence of testing and calibration laboratories) 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).

3.5.4 Off mode

3.5.4.1 Maximum power consumption

The power consumption of office equipment with printing functions in off mode must not exceed 0.3 watt according to the statutory requirements applicable in the EU.

Compliance verification

The manufacturer shall confirm compliance in Annex 1 and state the power consumption in off mode in Annex 8a according to Appendix E-M. The manufacturer shall submit a measurement report (Annex 8b) that verifies compliance with the values stated in Annex 8a. Measurements carried out by testing laboratories accredited according to ISO/IEC 17025 (General requirements for the competence of testing and calibration laboratories) 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).

3.5.4.2 Auto-off function (devices for private use)

Office equipment with printing function that were placed on the market for use by private end users 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 is the "sending and receiving of electronic messages and faxes".

Compliance verification

The manufacturer shall confirm compliance in Annex 1 and confirm the existence and default setting for the auto-off function in Annex 8a. Information on the auto-off function must be provided in the information and data sheet and in Annex 12.

3.5.4.3 Availability of switches

The device must have a switch to manually enter 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.

3.5.5 Energy-related data in the 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 (does not apply to professional devices),
b) Recovery times (does not apply to professional devices), and
c) Power consumption.

These three points describe the device's (electric power saving) behaviour in its delivered state.

- 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.
  - 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[22] 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 functions is connected to a Digital Front End (DFE) offered or licensed by the distributor. For all Digital Front Ends (DFE) offered or licensed by the distributor for use with one of its 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

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

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).

3.6 Noise emissions while printing

The noise emissions are evaluated by the declared 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 according to DIN EN ISO 7779 (Acoustics - Measurement of airborne noise emitted by information technology and telecommunications equipment). 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/m^2 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 (Method for measuring digital printing productivity) 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.

Determination of the A-weighted sound power level
At least 3 devices must be tested for each model. The declared A-weighted sound power level $L_{WA,c}$ is determined in accordance with ISO 9296:2017 (Acoustics - Declared noise emission values of information technology and telecommunications equipment) 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 declared 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)

Test value
The declared A-weighted sound power level for monochrome mode $L_{WAc,M}$ and colour mode $L_{WAc,F}$ must not exceed the test value.

$$L_{WAc} \leq L_{WA,lim}$$

The test value $L_{WA,lim}$ is determined to one decimal place based on the relevant page throughput for monochrome mode (S_M) and colour mode (S_F) 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 test value $L_{WA,lim} = 64$ dB applies.

Information on noise emissions

The values for the declared A-weighted sound power level $L_{WA,c}$ in dB to one decimal place and the relevant page throughput $S_{M/F}$ in images per minute (ipm) must be indicated in the information and data sheet under "Environmental and health-related statements". For devices capable of colour printing, the declared 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 confirm compliance in Annex 1 and submit the completed Annex 9 as verification. 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 (General requirements for the competence of testing and calibration laboratories) and also accredited for the required acoustic tests in accordance with ISO 7779 (Acoustics - Measurement of airborne noise emitted by information technology and telecommunications equipment). 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 data in Annex 8a.

3.7 Product carbon footprint

For products being awarded the Blue Angel for the first time, the manufacturer shall declare the product carbon footprint (PCF), expressed as the 100-year global warming potential (GWP-100) in CO_2 equivalents. The calculation must cover every phase of the product lifecycle, from acquiring the raw materials to the end of the service life, and must be carried out on the basis of the "SuMPO Environmental Product Declaration (EPD) - Product Category Rule (PCR) Imaging input and/or output equipment products" or ISO 14040/14044 in the version in force at the time of the product's market launch, taking into account the relevant transitional periods[23].

The report must include the following information on the calculation basis:

- Product marketing area,
- Scenario used, if declared,
- Estimated service life of the product,
- Method of calculating electricity consumption (e.g. according to a version of the ENERGY STAR criteria),
- Estimated print volume, preferably with a detailed calculation,
- Information on the energy mix used in production and the use phase (assumed region of use and production), if possible.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 and submit the product-specific global warming potential in a PCF report or in an Environmental Product Declaration

[23] SuMPO EPD 74 (17/10/2025): https://ecoleaf-label.jp/en/pcr/74

(EPD) after the product market launch. In the PCF/EPD report, the manufacturer must state the model numbers or other unique identifiers, such as product name(s), for the products to which the PCF/EPD report applies. The report must contain information about the assumptions made in the calculation, especially regarding the marketing area, the scenario used (if declared), the estimated service life, the method of calculating electricity consumption (e.g. ENERGY STAR version), print volume (preferably with a detailed calculation) and information on the energy mix used in production and the use phase (if possible).

3.8 Social criteria

For devices that are refurbished/reconditioned or remanufactured, only Paragraph 3.8.3 must be verified again for social criteria.

3.8.1 Due diligence of companies in the sourcing of raw materials

The manufacturer must carry out due diligence with respect to human rights for the mineral raw materials in the devices 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)[24].

Compliance verification

The applicant shall confirm compliance within the supply chain in Annex 1 and verify compliance by submitting a report from the manufacturer of the devices in Annex 14. The following reports are recognised:

- *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).*
- *Manufacturer report: this report must cover the entire process for due diligence with respect to human rights in the supply chain 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 this report must be audited by an independent, third-party auditing body (Annex 15), whereby the following auditing bodies are recognised:*
  - *Auditing body recognised by the Responsible Business Alliance (RBA)*
  - *Auditing bodies accredited according to SA 8000*
  - *Other auditing bodies following approval by the German Environment Agency, whereby the auditing bodies must meet the requirements for independence (Chapter VIII(A) of the Fair Labor Association (FLA) Charter), expertise and accountability (ISO 19011 - Guidelines for auditing management systems).*

Reports from a Responsible Business Alliance (RBA)-approved auditor based on an audit in the production facilities according to the RBA VAP Standard in the section "Responsible Sourcing of Minerals" of the currently valid version of the RBA Code Of Conduct[25]

[24] OECD (2019): OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. Third edition, OECD Publishing, Paris, 2019. https://doi.org/10.1787/3d21faa0-de

[25] Currently Section E3, Responsible Business Alliance Code of Conduct, Version 8.0.1 (2025), https://www.responsiblebusiness.org/code-of-conduct/

3.8.2 Support for local initiatives to promote responsible mining

The manufacturer of the devices (or also the parent company) must support at least one of the following initiatives to promote responsible mining:

- *ITSCI Programme for Responsible Mineral Supply Chains*[26]
- *Fair Trade Gold*[27]
- *Fairmined Gold*[28]
- *Responsible Minerals Initiative*[29]
- *The European Partnership for Responsible Minerals (EPRM)*[30]
- *JATAM Project Indonesia (Mining Advocacy Network)*[31]
- *IRMA – the Initiative for Responsible Mining Assurance*[32]

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 stated initiatives to promote responsible mining. 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).[33]

3.8.3 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.[34] In the case of used devices, the process of remanufacturing or refurbishing/reconditioning should be considered manufacturing.

The ten ILO core conventions:

- 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)

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[26] The ITSCI Programme, https://www.itsci.org/join-our-members/, Version: 2026

[27] Fairtrade Gold Standard, https://www.fairtrade.net/uk-en/products-and-producers/fairtrade-products/gold.html, Version: 2026

[28] Fairmined Standard Gold, https://fairmined.org/the-fairmined-standard/, Version: 2026

[29] Responsible Materials Standard, http://www.responsiblemineralsinitiative.org/, Version: 2026

[30] The European Partnership for Responsible Minerals, https://europeanpartnership-responsibleminerals.eu/, Version 2026

[31] JATAM Project Indonesia, https://www.jatam.org/en/, Version: 2026

[32] IRMA Initiative https://responsiblemining.net/what-we-do/standard/irma-mining-standard/, Version: 2026

[33] 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 mining town(s).

[34] ILO Labour Standards: https://normlex.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12000:0::NO:::, (Version: 2026)

- Occupational health and safety (ILO C155)
- Promotional framework for occupational safety and health (ILO 187)

and compliance with other ILO standards on relevant social risks:
- 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 also extends to levels 1 and 2 of the supply chain.
The individual levels of the supply chain are defined (according to BMI/Bitkom 2019)[35] as follows:
- Level 1: the final production site 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

For level 1 of the supply chain:
The manufacturer shall state the name and location of the production sites in level 1 in Annex 1 and declare compliance with the above-mentioned requirements for these production sites.
Certification (Annex 17) in accordance with the following standards will be accepted[36]:
- *The audit standard SA 8000[37]. 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[38] platinum/gold/silver. It is not necessary to submit certificates to verify that any compliance issues that were identified have now been resolved for this audit standard. Following a transitional period up to 31/12/2028, the audit standard RBA VAP Recognition Program silver is only recognised, insofar as the final audit confirms that there were no major findings related to the ten ILO core conventions promoted in the DE-UZ 239 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 239 Basic Award Criteria.*

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[35] BMI/Bitkom (2019), Procurement Office of the Federal Ministry of the Interior & the German Association for Information Technology, Telecommunications and New Media, Gemeinsame Erklärung zur sozialen Nachhaltigkeit im IT Einkauf der öffentlichen Hand [Joint Declaration on Social Sustainability in Public Sector IT Procurement] http://www.nachhaltige-beschaffung.info/SharedDocs/Dokumente NB/Verpflichtungserkl%C3%A4rung_ILO_BeschA_Bitkom_2019.pdf?__blob=publicationFile&v=3, Version: 2026

[36] 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 Office of the FMI.

[37] SA 8000:2104 is recognised for a transitional period up to 31/12/2029, after which SA 8000:2026 must be in place. SA 8000 Standard: https://sa-intl.org/resources/sa8000-standard/, Version: 2026

[38] Responsible Business Alliance, Validated Assessment Program (VAP), http://www.responsiblebusiness.org/vap/about-vap/, Version: 2026

- *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*[39] *according to ISO/IEC 17065 (Requirements for bodies certifying products, processes and services) that can verify compliance with the above-mentioned requirements.*
  The audit on which the report is based must not be more than three years old when the application is submitted.[40]

For level 2 of the supply chain:
The manufacturer shall confirm in Annex 1 that contractual obligations between a company in level 1 and a company in level 2 guarantee compliance with the requirements. In the case of reasonable doubt, the manufacturer must request documentation to verify that these obligations exist and provide feedback to RAL. RAL must be provided with the names and addresses of the affected production sites to clarify the matter.[41]

3.9 Requirements on remanufactured and refurbished/reconditioned devices

Extending the service life of products is a key measure in reducing the environmental impacts associated with the products. Remanufactured and refurbished/reconditioned devices are one way of putting the devices back into use and save a large proportion of the manufacturing energy and resources needed compared to new production.
The following conditions must be met in order for an application for the Blue Angel to be submitted for remanufactured and refurbished/reconditioned devices:

3.9.1 Blue Angel certification of the new product

As a new device, the device was certified with the Blue Angel for Office Equipment with Printing Function (DE-UZ 219 Edition January 2021 (v1) or later).

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[39] 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

[40] The manufacturer of the devices is obligated to submit revisions of the verifications at regular intervals if the contents of its 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 SA 8000 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 relevant production sites in levels 1 and 2 are in countries in risk category 2, a revision must be 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.

[41] This corresponds to the process in the "Joint Declaration on Social Sustainability in Public Sector IT Procurement" from Bitkom in Section 4 "Contracting Authority Rights". This can be found at: https://www.nachhaltige-beschaffung.info/SharedDocs/DokumenteNB/Verpflichtungserkl%C3%A4rung_ILO_BeschA_Bitkom_2019.pdf?__blob=publicationFile&v=7, Version: 2026

Compliance verification

The distributor of the used device shall inform RAL gGmbH of the model name and contract number. RAL gGmbH shall check the existence of a contract based on this information.

3.9.2 Remanufacturing and refurbishment/reconditioning process

- Remanufacturing takes place according to a recognised standard for remanufacturing, such as the British Standard BS 8887-220:2010 (Remanufacture)[42], and the process is certified according to this standard. The device is issued with a warranty by the distributor, like a new device. Alternatively, the refurbishment/reconditioning device can also be brought into a saleable condition according to the less stringent British Standard BS 887-240:2011 (Re-conditioning)[43]. The distributor issues a warranty of at least 2 years.
- Remanufacturing or refurbishment/reconditioning are carried out using original spare parts or parts from identical used devices. Alternatively, the newly installed parts meet the material requirements according to Paragraph 3.3.
- When using non-original spare parts, the emission tests stated in these criteria must be carried out again (see Chapter 3.4).
- Original toner or ink is used for filling. RAL gGmbH must be informed about any change to the toner or ink type and this will require the submission of a new test report regarding the substance emissions according to Paragraph 3.4.1 or 3.4.2.
- The remanufactured and refurbished/reconditioned devices must be labelled as such devices in the distribution process and, if possible, additionally on the packaging (e.g. "Remanufactured or refurbished/reconditioned device" or "This device is a remanufactured or refurbished/reconditioned, the functionality of which is guaranteed by the distributor")

Compliance verification

The applicant shall confirm compliance in Annex 1 and submit the certification for the sales preparation process and cite the standard according to which this has been carried out.
The manufacturer shall declare the use of original spare parts or, alternatively, submit the documents for verifying compliance according to Paragraph 3.3 for the non-original parts used and – if necessary – the emission measurements according to Paragraph 3.4.
The relevant product documents shall be submitted as verification of the offered warranty and labelling as remanufactured or refurbished/reconditioned.

3.10 Product documents and information for users

The documentation supplied with the devices (user manual, product documents) must include both technical specifications and the detailed environmental and health-related information for users stated below. 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.

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[42] Design for manufacture, assembly, disassembly and end-of-life processing (MADE) - The process of remanufacture. 31/3/2010. Equivalent standards can be submitted to the UBA for review.
[43] Design for manufacture, assembly, disassembly and end-of--life processing (MADE) - The process of reconditioning. March 2011. Equivalent standards can be submitted to the UBA for review.

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 or commercial end users,
- A declaration on whether it is a professional device according to the definitions in Paragraph 1.4,
- A declaration on the minimum proportion of PCR plastic according to Paragraph 3.2.1.2,
- If applicable, information on the take-back system for the reuse of devices according to Paragraph 3.2.1.4,
- Information on device take-back and environmental-friendly disposal at the end of the use phase according to Paragraph 3.2.1.4,
- Instructions for the proper handling of colourant/toner modules according to Paragraph 3.3.5.5,
- Instructions on the take-back of used photoconductor drums according to Paragraph 3.2.3,
- Information on the take-back of modules and containers for colourants and the URL to declare the reused and recycled content according to Paragraph 3.2.4 3.2.4,
- If applicable, information on the yield of modules/containers provided with the device according to Paragraph 3.2.5,
- Information on use of recycled paper and resource-conserving paper handling (including information on duplex and N-up printing) according to Paragraph 3.2.6,
- If applicable: Information on the typical service life and typical use conditions according to Paragraph 3.2.7.1, on the availability of spare parts and exchange parts and on repair options, as well as on the maintenance and cleaning of equipment according to Paragraphs 3.2.7.3, 3.2.7.4 and 3.2.7.5.
- Instructions for proper device placement with regard to substance emissions according to 3.4.3,
- According to 3.5 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 3.6,
- Information on which ink or toner cartridges have been certified with the Blue Angel,
- 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 239"). 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 (Annex 12).
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 the Blue Angel before the Contract on the Use of the Environmental Label is concluded and that the essential environmental and health-related information is contained in the detailed product documents (user manual or electronic media). If applicable, the distributor shall also state the link providing access to this information.

3.11 Overview of possible future requirements

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

- Increase in the proportion of post-consumer recycled plastic in the plastic parts;
- Evaluation of the approval of recycled material from chemical recycling;
- Evaluation of mandatory certification for post-consumer recycled materials;
- Evaluation of an extension to the ban on polystyrene packaging;
- Evaluation of stricter requirements for take-back systems for the refurbishment and reuse of devices;
- Evaluation of an amendment in line with a new version of the ENERGY STAR for Imaging Equipment;
- Evaluation of more comprehensive exclusions of substances with certain hazard characteristics from device materials and inks and toners, especially an evaluation of exceptions and assessment of whether CMR Cat. 2 substances in casings and device parts can also be excluded;
- Evaluation of other requirements on the substitution of PFAS;
- Evaluation of the continued measurement of dust emissions (gravimetric), as particle measurement is a sufficient method of measurement, and of ozone, as relevant emissions from laser printers only occur when a corona wire is used;
- Evaluation of stricter requirements for social criteria, especially with regard to the acceptance of higher RBA standards (gold, platinum);
- Review of the criteria for used devices and the associated definitions.

4 Applicants and Parties Involved

Manufacturers or distributors of products named in 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,
- The German Environment Agency (Umweltbundesamt), which, after the signing of the contract, receives all data and documents submitted in application for the Blue Angel in order to be able to further develop the Basic Award Criteria.

5 Use of the Environmental Label

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

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

Contracts on the Use of the Environmental Label are concluded to fix the terms for the certification of products under Paragraph 2. Such contracts shall run until 31 December 2031. They shall be extended by periods of one year each, unless terminated in writing by 31 March 2031 or 31 March of the respective year of extension.

After the expiry of the contract, the Environmental Label may neither be used for labelling nor for advertising purposes. This regulation shall not affect products being still in the market.

The applicant 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.

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Appendix ARelevant laws, standards and literature

- Blue Angel DE-UZ 219 (2021): Blue Angel - Office Equipment with Printing Function (Printers and Multifunction Devices), DE-UZ 219, Edition January 2021, Version 5. RAL, 2026. https://produktinfo.blauer-engel.de/uploads/criteriafile/de/188/DE-UZ%20219-202101-de-Kriterien-V5.pdf
- BMI/Bitkom (2019): Gemeinsame Erklärung zur sozialen Nachhaltigkeit im IT Einkauf der öffentlichen Hand [Joint Declaration on Social Sustainability in Public Sector IT Procurement] Procurement Office of the Federal Ministry of the Interior & the German Association for Information Technology, Telecommunications and New Media (Bitkom), Berlin. https://www.nachhaltige-beschaffung.info/SharedDocs/DokumenteNB/Verpflichtungserkl%C3%A4rung_ILO_BeschA_Bitkom_2019.pdf
- BS 8887-220:2010-03-31 - Design for manufacture, assembly, disassembly and end-of-life processing (MADE). The process of remanufacture. Specification. British Standards, 2010. https://www.dinmedia.de/en/standard/bs-8887-220/128527878
- BS 8887-240:2011 - Design for manufacture, assembly, disassembly and end-of-life processing (MADE) - Reconditioning. British Standards 2011. https://www.dinmedia.de/en/standard/bs-8887-240/141045411
- DIN EN 15343:2008-02 - Plastics - Recycled Plastics - Plastics recycling traceability and assessment of conformity and recycled content; German version EN 15343:2007, DIN Media. https://www.dinmedia.de/en/standard/din-en-15343/99632421
- DIN EN 12281:2003-01 - Printing and business paper - Requirements for copy paper for dry toner imaging processes; German version EN 12281:2002. DIN Media, 2003. https://www.dinmedia.de/en/standard/din-en-12281/52206392
- DIN 33871-1:2012-05 - Information technology - Office machines, inkjet print heads and inkjet tanks for inkjet printers - Part 1: Preparation of refilled inkjet print heads and inkjet tanks for inkjet printers. DIN Media, 2012. https://www.dinmedia.de/en/standard/din-33871-1/150185505
- DIN EN IEC 62474 VDE 0042-4:2022-10 - Material declaration for products of and for the electrotechnical industry, German version EN IEC 62474:2019 + A1:2021. VDE Verlag, 2022. https://www.vde-verlag.de/normen/0090093/din-en-iec-62474-vde-0042-4-2022-10.html
- DIN EN ISO 19011:2025-04 - Draft - Guidelines for auditing management systems; German and English version prEN ISO 19011:2025. DIN Media, 2025. https://www.dinmedia.de/en/draft-standard/din-en-iso-19011/389946981
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Appendix BAssignment of the hazard statements to the hazard categories according to chemical law

The following table assigns the hazard statements (H statements) to the hazard categories defined in the Regulation on classification, labelling and packaging of substances and mixtures (CLP Regulation (EC) No 1272/2009). The requirements according to Chapter 3.3 apply in the event that the limit values for the individual substances in a mixture are exceeded.

Table 14: Limit values for substances, above which the requirements according to Chapter 3.3 apply

Hazard category	Hazard statement (H statement)	Wording	Limit value (% by weight)
Toxic substances			
Acute Tox. 1 Acute Tox. 2	H300	Fatal if swallowed.	0.1
Acute Tox. 3	H301	Toxic if swallowed.	0.1
Asp. Tox. 1	H304	May be fatal if swallowed and enters airways.	1.0
Acute Tox. 1 Acute Tox. 2	H310	Fatal in contact with skin.	0.1
Acute Tox. 3	H311	Toxic in contact with skin.	0.1
Acute Tox. 1 Acute Tox. 2	H330	Fatal if inhaled.	0.1
Acute Tox. 3	H331	Toxic if inhaled.	0.1
Carcinogenic, mutagenic and reprotoxic substances			
Muta. 1A Muta. 1B	H340	May cause genetic defects.	0.1
Muta. 2	H341	Suspected of causing genetic defects.	1.0
Carc. 1A Carc. 1B	H350	May cause cancer.	0.1
Carc. 1A Carc. 1B	H350i	May cause cancer if inhaled.	0.1
Carc. 2	H351	Suspected of causing cancer.	0.1
Repr. 1A Repr. 1B	H360F	May damage fertility.	0.1
Repr. 1A Repr. 1B	H360D	May damage the unborn child.	0.1
Repr. 1A Repr. 1B	H360FD	May damage fertility. May damage the unborn child.	0.1
Repr. 1A Repr. 1B	H360Fd	May damage fertility. Suspected of damaging the unborn child.	0.1
Repr. 1A Repr. 1B	H360Df	May damage the unborn child. Suspected of damaging fertility.	0.1
Repr. 2	H361f	Suspected of damaging fertility.	0.1

Hazard category	Hazard statement (H statement)	Wording	Limit value (% by weight)
Repr. 2	H361d	Suspected of damaging the unborn child.	0.1
Repr. 2	H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.	0.1
Other potential hazards			
Lact.	H362	May cause harm to breast fed children.	0.1
STOT SE 1	H370	Causes damage to organs.	1.0
STOT SE 2	H371	May cause damage to organs.	1.0
STOT RE 1	H372	Causes damage to organs through prolonged or repeated exposure.	1.0
STOT RE 2	H373	May cause damage to organs through prolonged or repeated exposure.	1.0
Aquatic Acute 1	H400	Very toxic to aquatic life.	0.1
Aquatic Chronic 1	H410	Toxic to aquatic organisms.	1.0
Aquatic Chronic 2	H411	Toxic to aquatic organisms with long-lasting effects.	1.0
Aquatic Chronic 3	H412	Harmful to aquatic organisms with long lasting effects.	1.0
Aquatic Chronic 4	H413	May cause long lasting harmful effects to aquatic organisms.	1.0
	EUH029	Contact with water liberates toxic gas.	1.0
	EUH031	Contact with acids liberates toxic gas.	1.0
	EUH032	Contact with acids liberates very toxic gas.	1.0
	EUH070	Toxic by eye contact.	1.0
ED HH 1	EUH380	May cause endocrine disruption in humans.	0.1
ED HH 2	EUH381	Suspected of causing endocrine disruption in humans.	1.0
ED ENV 1	EUH430	May cause endocrine disruption in the environment.	0.1
ED ENV 2	EUH431	Suspected of causing endocrine disruption in the environment.	1.0
PBT	EUH440	Accumulates in the environment and living organisms including in humans.	0.1
vPvB	EUH441	Strongly accumulates in the environment and living organisms including in humans.	1.0

Hazard category	Hazard statement (H statement)	Wording	Limit value (% by weight)
PMT	EUH450	Can cause long-lasting and diffuse contamination of water resources.	0.1
vPvM	EUH451	Can cause very long-lasting and diffuse contamination of water resources.	1.0

Appendix CAdditional appendices online

Further appendices can be found online in a ZIP file:
https://www.blauer-engel.de/en/certification/basic-award-criteria#UZ239-2026

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

Appendix E-I Energy – Information for users

Appendix E-M Energy - Measuring requirements, interpretation guide regarding recovery times and requirements regarding the definition of the different idle modes

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

Appendix DVersion history

No changes have been made to Environmental Label DE-UZ 239 Office Equipment with Printing Function (Printers and Multifunction Devices), Edition July 2026, Version 1.