

BLUE ANGEL

The German Ecolabel



**Telephone systems and corded voice-over-IP
telephones**

DE-UZ 220

Basic Award Criteria

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The Environmental Label is supported by the following four institutions:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

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



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



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



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

If you require further information please contact:

RAL gGmbH

RAL UMWELT

Fränkische Straße 7

53229 Bonn

Tel: +49 (0) 228 / 6 88 95 - 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, Nature Conservation and Nuclear Safety, the German Environmental Agency and considering the results of the expert hearings conducted by RAL gGmbH, the Environmental Label Jury has set up these Basic Criteria for the Award of the Environmental Label. RAL gGmbH has been tasked with awarding the Environmental Label.

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

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

1.2 Background

Telephone systems transfer data between both a variety of terminals like telephones, fax machines or answering machines and also between these terminals and one or more lines on the public telephone network. The connection to the public telephone network is achieved via analogue telephone connections, via the digital telecommunications network (ISDN) and increasingly via internet connections (IP = Internet Protocol). Communication structures in companies and private households are becoming increasingly unified ("Unified Communication"¹). For telephone terminals, this means that conventional ISDN or analogue telephones are being increasingly replaced by so-called "voice over IP" telephones (VoIP telephony), which are integrated in companies via telephone systems.

Alongside the basic function of making and receiving telephone calls, VoIP telephones often have extra functions that provide access to additional communication media (messaging services) and supportive communication information (caller ID, customer data, call history, etc.). Other extra functions can be made available by integrating hardware and software (e.g. a camera for video conferences, software for door-opening systems). However, these additional functions may cause VoIP telephones to consume 1.5 to 5 times more energy than traditional ISDN or analogue telephones.

Telephone systems can handle a wide range of possible users from one to multiple thousands. A user is usually a terminal, whereby several terminals can be assigned to one person, so that the number of users is not necessarily the same as the number of persons who use the telephone system. Small systems for between 1 to < 8 users are installed in both private households and commercially in small companies such as law firms, doctor's surgeries or small businesses and are generally small devices with minimal power consumption. These so-called PBX boxes are normally only replaced very rarely in households and they tend to play a subordinate role for

¹ Unified Communications (UC) describes the integration of communication media into a uniform application environment. By unifying all communication services (real-time services such as voice and video and non-real time services such as e-mail) and integrating presence functions, such as instant messaging services, the aim is to make communication partners engaged in distributed work easier and quicker to reach.

this reason and also due to their low consumption of energy and resources. Larger systems for > 8 users are almost exclusively installed in commercial enterprises and can, depending on their size, exhibit increased energy consumption that can be reduced through the use of intelligent power management systems and the optimal arrangement of the hardware components e.g. connected VoIP telephony. Larger telephone systems installed for commercial use also require a significant amount of hardware that contains valuable materials. In general, the hardware found in telephone systems has a long service life. From the perspective of protecting both the environment and resources, this service life should be maintained for as long as possible despite the rapidly developing state of technology in this sector.

This technology is subject to trends and it can thus be assumed that it will continue to develop in the future (also see Paragraph 3.5).

1.3 Environmental aspects

This environmental label focuses, in particular, on minimising energy consumption and the durability of products.

Minimising electric power consumption is a major goal of environmental protection in order to preserve energy resources and protect the climate. Telephone systems installed for commercial use are generally operated 24 hours a day, every day of the week, in order to constantly guarantee the internal and external flow of information at the company. In order to promote the environmental goals stated above, the energy consumption of the terminals and the relevant telephone systems used should be reduced to the lowest level technically possible within the framework of the user's requirements, especially with respect to the most frequently used idle mode (standby mode). The connected peripheral devices (terminals) and some components in the telephone systems determine how much electricity is consumed, e.g. using power supply units with high efficiency levels, intelligent power management systems and optimal switching processes on the circuit boards, as well as a modular hardware design that takes the requirements of the customer into account (replaceable components using modular plug-ins).

Another important goal of environmental protection is the preservation of resources through the reduction of the environmental impact caused by the manufacture and disposal of the devices. This can be achieved through the avoidance of environmentally hazardous auxiliary and operating materials during manufacture, the promotion of a long service life for the telephone systems or its individual parts and through the high-quality recycling of valuable material components. A reduction in the environmental impact can be achieved through, amongst other things, the use of durable and high-quality products.

1.4 Objectives of the Environmental Label

The "Blue Angel" environmental label for VoIP telephones and telephone systems should inform customers purchasing these types of devices that products issued with this label – in contrast to other products – provide greater preventative protection for the environment, human health and the consumer. Therefore, the environmental label can act as a decision-making aid for purchasing new devices.

It is a voluntary label that is designed to motivate manufacturers to develop durable devices with the lowest possible energy consumption and which also allows them to easily inform customers about these product characteristics in a targeted way.

Therefore, the environmental label should be awarded to telephone systems and VoIP telephones that have the following environmental properties:

- Optimised and the lowest possible energy consumption
- Preservation of resources as a result of a long service life (reconditioning, repairability/provision of spare parts, recyclable design, recycling of the valuable material components, up-datability/scalability of software, modular nature of hardware)
- Avoidance of environmentally damaging additives and materials

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



1.5 Compliance with legal requirements

Legal regulations according to European and German law have been taken into account in the development of the Basic Award Criteria and they must be observed by label users. In particular, the following legal requirements must be observed:

- The Electrical and Electronic Equipment Act (ElektroG)² and the ordinance to limit the use of hazardous substances in electrical and electronic equipment (Material Ordinance for Electrical and Electronic Equipment - ElektroStoffV)³ to implement the EU directives⁴ into German law are observed.
- The substance requirements defined by the EU Chemicals Regulation REACH (1907/2006/EC)⁵ and Regulation EC No. 1272/2008 (CLP Regulation)⁶ are observed.

² Law for the sale, return and environmental disposal of electrical and electronic equipment, last amended on 27 June 2017

³ Material Ordinance for Electrical and Electronic Equipment, last amended on 3 July 2018

⁴ Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (also known as the WEEE Directive); as well as Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (also known as the RoHS Directive)

⁵ Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

⁶ Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, as well as amending Regulation (EC) No. 1907/2006

- Regulation (EU) No. 2019/1782⁷ (External Power Supplies Regulation), provided that the device comes with an external power supply.
- Directive 2014/53/EU (RED Directive) of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC implemented in German law in the German Radio Equipment Act (FuAG).
- Directive 2001/95/EC of the European Parliament and of the Council of 3 December 2001 on general product safety implemented in German law in the Law for making products available on the market (Produktsicherheitsgesetz – ProdSG).
- The European directive on the making available on the market of electrical equipment designed for use within certain voltage limits 2014/35/EU (Low Voltage Directive) is an important regulatory tool for the safety of electrical equipment.
- Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive)
- The processing of personal information in accordance with the European General Data Protection Regulation (GDPR)⁸

1.6 Definitions and abbreviations

- **Operating modes**
 - ♦ **Low power mode:** A mode with a reduced energy consumption in comparison to *idle mode*, which can be set where possible according to the time and day of the week. Another name for this mode is *deep sleep mode*.
 - ♦ **Idle mode:** In *idle mode*, the device is in an idle state from which it can be immediately activated and placed into active mode if one of the functions of the telephone system is utilised. There is no significant level of data transfer or computational activity in either the telephone system or any connected device in *idle mode*. Other names for this mode are *standby mode* or *ready mode*.
 - ♦ **Active mode:** In *active mode*, at least one function of the telephone system is being utilised (there is an active connection), there is computational activity and data transfer is taking place in the device.
- **Voice over IP** (also VoIP, IP telephony) describes telephoning over the internet or a computer network.
- **ISDN:** Integrated Services Digital Network (ISDN) is a comprehensive, integrated digital network service that has been developed from the analogue telephone network. ISDN integrates different services into one transmission network. This makes the integration of telephone, facsimile, teletex, video telephony and data transfer services possible.
- **VPN:** VPN describes a virtual, private (closed) communication network. It is virtual in the sense that it doesn't create its own physical connection but uses an existing communication network as a transport medium. The VPN is used to connect users in an existing communication network with another network.

⁷ Commission Regulation (EU) 2019/1782 laying down ecodesign requirements for external power supplies pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 278/2009

⁸ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC

DECT: Digital Enhanced Cordless Telecommunications (DECT) is a European standard for cordless digital voice and data communications for telephones and local mobile communication systems.

- **Interfaces and connectible device**

- ♦ **Port:** physical connectors on hybrid components (e.g. the ports on components named below), i.e. connection possibilities for a cable
- ♦ **FXS/FXO:** Foreign Exchange Subscriber or Foreign Exchange System (FXS) is a standard interface in analogue telephone systems. The associated Foreign Exchange Office (FXO) describes all devices connected to the telephone system that behave as terminals (fax machines, telephones, etc.). An FXO device must always be connected to an FXS interface.
- ♦ **S0 interfaces** for ISDN terminals.
- ♦ **Ethernet interfaces** for exchanging IP-based data packages via a local area network (LAN) connection
- ♦ **Wireless interfaces:** Instead of a physical connection for a device connected via a cable (port), a telephone system can also have wireless interfaces which can be used to connect up e.g. DECT cordless telephones or Wi-Fi-capable devices (e.g. a printer).
- ♦ **User:** A user is a physical device that is connected to the telephony system and can be contacted via its own IP address. An equivalent description is thus **IP device**. The number of users may differ from the number of telephones actually connected to the telephone system because other communication devices (e.g. door intercom systems, signal transmitters, actuators, sensors) are also considered to be IP devices.

- **Power supply units**

- ♦ **Redundant and non-redundant power supply units:** Redundant power supply units, i.e. with multiple connections, are often used to improve the reliability of IT devices. This is achieved either by using several independent voltage paths within one single power supply unit or by using multiple independent power supply units in parallel. Every independent voltage path or independent power supply unit can cover the entire power requirements of the IT device. Within the scope of these Basic Award Criteria, a differentiation is made between redundant and non-redundant power supply units. The criteria for non-redundant power supply units apply whenever a single power supply unit without a redundancy function is used.
- ♦ The **power factor** in electricity supply equipment (i.e. power supply units) describes the relationship between real power (P) and apparent power (S), which is the same as the cosine of the phase shift angle ($\cos \varphi$). To ensure a balanced load on the electricity grid, a power factor near to 1 is desirable.
- **Power-over-Ethernet (PoE):** PoE devices can cover their electricity demand through the network cable via which they are connected to the internal network and do not require their own power supply unit.
- **SIP:** The Session Initiation Protocol (SIP) is a member of the internet protocol family. In contrast to the Internet Protocol (IP), SIP is exclusively used to create a streaming connection (connection for transferring a continuous flow of data) for transmitting speech. Alongside speech communication, other streamed applications are conceivable. As an open standard, SIP is widely used by providers of internet telephony.
- **Substances Of Very High Concern (SVHC)** in the sense of the REACH Regulation are those chemical compounds that fulfil the criteria according to Article 57 of the REACH Regulation. This means CMR substances (carcinogenic, mutagenic or reprotoxic substances,

categories 1A and 1B) and PBT substances that are classified as persistent, bioaccumulative and toxic or as very persistent and very bioaccumulative (vPvB) or other substances that are similarly alarming for other reasons.

- **Constituent components** are substances added to the intermediate product or the product and remain there unchanged 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. If certain impurities are considered to be particularly problematic, they are addressed in their own requirements.
- The **list of candidates** according to REACH Article 59 (1) is the "Candidate List of substances of very high concern for Authorisation".
- **Sales and delivery packaging** in the sense of these Basic Award Criteria refers to the packaging in which the device is directly packaged for customers. According to §3 (1) No. 1b of the German Packaging Law (VerpackG), delivery packaging is a subcategory of sales packaging when it is used for delivering the product directly to the customer. Packaging for the transport of the goods incl. the sales packaging to retailers is classified as "transport packaging" according to VerpackG and is not covered by the term "delivery packaging" in the sense of these Basic Award Criteria.
- **PCR** is the abbreviation for post-consumer recycled plastic. In contrast to the term *pre-consumer*, *post consumer* means that the recycled materials are generated using waste materials from households or commercial, industrial and institutional facilities in their role as end consumers of the products (and not from industrial waste).
- **SRTP** and **TLS** describe the encryption of the signalling channel (TLS = Transport Layer Security) and the encryption of the voice channel (SRTP = Secure Real-Time Transport Protocol) to protect conversations and user data. Voice/image data are the user data generated by the telephone call itself and are transported over the **voice channel**, they are firstly digitised and then compressed before being transmitted. **Signalling data** describes e.g. the technical data that can and should be used to establish, maintain and disconnect a telephone call.
- **DHCP** is a protocol that is used to manage IP addresses in a network and allocate them to the requesting device. DHCP enables every user to automatically configure itself on the network.
- **System telephones** (in Appendix A) are devices that are often integrated into telephone systems and which are specially designed for use with the respective telephone system. Depending on their area of application, system telephones are available in different versions and with various functions (basic telephone functions through to system telephones with numerous functions specifically designed for secretaries or employees with special requirements).

2 Scope

These Basic Award Criteria apply to telephone systems irrespective of the possible number of users. The scope covers telephone systems that are individual devices. Excluded from the scope of these Basic Award Criteria are routers with a telephone system function, which are covered by the scope of Basic Award Criteria DE-UZ 160 (Routers).⁹

These Basic Award Criteria also apply to telephones that use an Ethernet cable for making phone calls via IP technology (IP= Internet Protocol), i.e. telephones that make phone calls across computer networks based on internet standards. This only includes stationary telephones that are connected via Ethernet or Wi-Fi. Such telephones are called VoIP telephones below.

All peripheral devices that are not IP-based, such as analogue or ISDN telephones or fax machines, firewalls/VPN, and the power supply units for these peripheral devices are not covered by the scope of these Basic Award Criteria. Telephones that use the DECT standard for communications – even with integrated VoIP functions – fall under the criteria of DE-UZ 131 (Digital Cordless Phones).

3 Requirements

These Basic Award Criteria cover various different products. All of the criteria apply to all devices, unless specifically indicated. Alternatively, different requirements for different products can be specified within one criterion. In this case, the differences will also be specified in the text for the respective criterion.

3.1 Energy efficiency

3.1.1 Power consumption and energy consumption

The energy consumption criteria apply to the *idle mode* (standby mode). The energy consumption in this mode should be stated in kWh per year.

Calculating the energy consumption:

$$\text{Energieverbrauch} \left[\frac{\text{kWh}}{\text{a}} \right] = \frac{8760 \text{ h}}{1 \text{ a}} * \frac{1 \text{ kW}}{1000 \text{ W}} * P_{\text{Idle Mode}}[\text{W}]$$

Depending on the product to be certified with the Blue Angel in accordance with these criteria, either one of the following two criteria apply or both of the criteria apply if the product is a combination of a telephone system and VoIP telephones.

⁹ Scope of UZ 160: "Router means a network component to forward data packets on the basis of information of the network layer (L3) from one network to another and within the network. DE UZ-160 (Version 3, valid from 12/2019) applies to routers that: (a) are used to connect private households or small businesses to the Internet; (b) can be supplied with electric power via an integrated or external power supply unit, a battery or a network connection; (c) and include wired and/or radio-based network interfaces and modems. The Basic Award Criteria do not apply to modems that are externally connected to a router." (status 08/2020)

Telephone systems

The power consumption of the telephone system in *idle mode* must not exceed the maximum power consumption value stated below:

$$P_{Idle Mode}[W] \leq P_{max}[W]$$

The maximum power consumption is calculated as follows:

$$P_{max}[W] = P_{BW} + P_{pro Port} * Anzahl pyhsischer Ports + P_{pro IP-Device} * Anzahl anschließbarer IP Devices$$

where $P = Leistungsaufnahme$; $BW = Basiswert$

The power consumption of the terminals (e.g. energy supply via PoE or ISDN) is not included in the calculation for the power consumption.

Table 1: Reference values for individual components for the energy consumption calculation for telephone systems

Description	Reference value
Basic value for the power consumption of the telephone system P_{BW}	15 watts
Power consumption per physical interface (ports and wireless interfaces) $P_{pro Port}$	0.3 watts
Power consumption per connectible IP device $P_{pro IP-Device}$	0.1 watts

VoIP telephones

VoIP telephones must have an *idle mode* (standby mode) to which the device automatically switches a maximum of 5 minutes after an active interaction or a phone call (see "Power management").

The power consumption of the VoIP telephones in *idle mode* must not exceed the maximum power consumption value stated below:

$$P_{Idle Mode}[W] \leq P_{max}[W]$$

The maximum power consumption in *idle mode* (standby mode) is calculated as follows (based on the Energy Star standard):

$$P_{max}[W] = P_{BW} + P_{Zusätzlicher Port} + P_{proxy}$$

where $P = Leistungsaufnahme$; $BW = Basiswert$

Table 2: Limit values for individual components for the energy consumption calculation

Description	Reference value	
P_{BW}	Basic value for the power consumption of the telephone in idle mode (standby mode)	2.0 watts
$P_{Zu\ddot{a}tzlicher\ Port}$	One single additional power consumption allowance either for one or more 1 gigabyte Ethernet ports according to IEEE 802.3az ¹⁰ or for one Wi-Fi port	1.2 watts
P_{proxy}	Network presence during idle mode to retain the IP address	0.3 watts
	or Remote wake function ¹¹	0.5 watts

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the contract and state the power consumption value in idle mode ($P_{Idle\ Mode}$), the annual energy consumption in idle mode (standby mode) and the calculated maximum power consumption value for the device being certified in Annex 2 to the contract. In addition, the applicant shall submit a test report from a testing institution accredited for electrotechnical tests in accordance with DIN EN ISO/IEC 17025 in Annex 3 to the contract. The measurements must be carried out in accordance with the formulas described above and the requirements in Appendix A to these Basic Award Criteria. Instead of this test report, it is also possible in the case of VoIP telephones for the applicant to submit the test report confirming that the device can be certified with the ENERGY STAR¹².

3.1.2 Information criterion

The applicant must provide clearly presented information (in table form) on the power consumption of the device or devices for which an application for the Blue Angel has been submitted, including information on the number of physical ports and the maximum number of connectible IP devices (in watts, kilowatts or as energy consumption in kilowatt-hours per year), at least for *idle mode*, as well as the maximum power consumption value. In the case of VoIP telephones, this information must also be provided for *low power mode*. It is possible to provide this information in a combination of minimum and maximum values or alternatively as average values. It must be stated whether the power consumption values were measured before (mains voltage) or after the power supply unit (low voltage).

The values for *idle mode* that were measured in accordance with the measurement guidelines in Appendix A to these Basic Award Criteria must be stated. The measurement methods used to measure the power consumption in *low power mode* and the maximum power consumption must be described.

¹⁰ Standard from the Energy Efficient Ethernet Task Force. <https://www.ieee802.org/3/az/> (accessed on 11/09/2020)

¹¹ Definition of the remote wake function in Energy Star (status September 2020): In low power mode, the system is capable of remotely waking upon request from outside the local network while maintaining the IP addresses and presence on the network, i.e. remote wake includes the network presence function

¹² <https://www.energystar.gov/sites/default/files/specs//Telephony%20V3%20ENERGY%20STAR%20Program%20Requirements.pdf> (last accessed on 02/10/2020)

Compliance verification

The applicant shall verify compliance by submitting Annex 4 in one of the following forms:

- *a corresponding table with all of the required information*
- *the published technical data sheet for the device in which the required information can be seen in the required level of detail*
- *Annex 2 containing sufficiently detailed information for the requirements and which serves as verification for this and also the previous criterion.*

For the power consumption values that were not measured in accordance with Appendix A, it is sufficient for the applicant to also submit a description of the measurement setup used in each case to measure these values as Annex 5.

3.1.3 Power management for VoIP telephones

The VoIP telephones must provide optimum power management in each operating mode. After a specified period of time without activity, the configured device must automatically switch to an *idle mode* (standby mode) during which all functions that are not required are deactivated. The device must switch to the *idle mode* after a maximum of 5 minutes in its factory setting. It must be possible for the user to set the time period until the device reaches *idle mode*.

It must also be possible for the user to set the brightness of the display for *idle* and *active mode* or the brightness must be adjusted based on the ambient light. For all active modes, the display lighting must be set to a low level in the delivery status.

The controls for adjusting the volume of the ring tone and all other controls must be set to medium (max. 50%) in the device's factory setting.

The user information must provide a clear and easy-to-understand description of the setting function for the power management. The most environmentally efficient setting in each case must be highlighted in the user information.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the contract or, if required, submit a declaration on the equivalence of the standard used as Annex 6 to the contract. It is also sufficient to submit the pages of the user information in which the setting function for the power management is explained as Annex 7 to the contract.

3.1.4 Power supply units

Depending on the product to be certified with the Blue Angel in accordance with these criteria, either one of the following two criteria also apply or both of the criteria also apply if the product is a combination of a telephone system and VoIP telephones.

Telephone systems

The following requirements are placed on the efficiency of power supply units (PSUs):

Table 3: Minimum values for PSU efficiency and power factor

Load state as percentage of the rated power	Minimum value for PSU efficiency at 230 V AC voltage			Minimum value for the power factor (PFC) for PSUs
	20%	50%	100%	50%
Non-redundant PSU with rated power \geq 150 watt	90%	92%	89%	0.90
Redundant PSU with rated power \geq 150 watt	88%	92%	88%	0.90
Internal or external PSU with rated power < 150 watt	-	90%	-	-

VoIP telephones

VoIP telephones must be supplied with electricity via power-over-Ethernet, i.e. they must work without an external power supply unit.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the contract and state the values for the PSU efficiency and power factor for the different load states. In the case of power supply units with several output voltages, the measurement of the PSU efficiency must be carried out using the voltage with the highest rated power. In addition, the applicant shall submit test reports from an independent testing laboratory, which is accredited for these types of measurements in accordance with DIN EN ISO/EC 17025, or from a laboratory which has been recognised by an independent body as an SMT laboratory (supervised manufacturer testing laboratory) as Annex 8 to the contract. Verification of compliance can also be provided by submitting test reports that confirm that the power supply units have been labelled with the 80 PLUS Gold (230 V) mark. The test report must confirm the stated values for the PSU efficiency and power factor.

3.2 Requirements for the preservation of resources, product durability and compatibility

3.2.1 Protocols

The **telephone system** must support the Session Initiation Protocol (SIP) and/or H.323 protocol.

Compliance verification

The applicant shall confirm compliance with the criterion in Annex 1 to the contract. If a telephone system is part of the product to be certified, the applicant shall also demonstrate that the hardware compatibility and all basic functions are also maintained when used with terminals from at least two other manufacturers and submit corresponding verifications as Annex 9 to the contract.

3.2.2 Expandability

Depending on the product to be certified with the Blue Angel in accordance with these criteria, either one of the following two criteria apply or both of the criteria apply if the product is a combination of a telephone system and VoIP telephones.

Telephone systems

In the case of telephone systems with connection options for more than 20 users, the telephone system must be scalable to incorporate further users. If this is not possible through adaptations to the software, the scalability of the number of users must be supported through the modular design of the hardware. The software must be designed so that it supports the scalability of the telephone system in the form of the required technical enhancements to the hardware.

VoIP telephones

It must be possible to update the software and expand the basic functions of the product. The user information must include information on the options for updating the software.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the contract. For telephone systems, the applicant shall submit the corresponding pages of the product documentation as Annex 10 to the contract. If the possibilities for adapting the hardware are not indicated in the product documentation, the applicant shall describe and explain them in writing in Annex 10.

3.2.3 Repairability, provision of spare parts and security updates

The telephone systems must be designed so that they can be repaired by easily replacing individual functional modules (e.g. printed circuit boards).

The applicant undertakes to make sure that the provision of spare parts for the repair of the devices and the infrastructure required for the repair is guaranteed for at least 6 years after the discontinuation of the product is announced¹³. Spare parts are those parts which, typically, may break down within the scope of the ordinary use of a product. Whereas those parts which normally exceed the life of the product are not to be considered as spare parts.

Software updates to close any security gaps so that the devices can be used in accordance with the manufacturer's security guidelines must be provided for at least 6 years after the

¹³ This must be publicly announced.

discontinuation of the product is announced¹⁴ by the manufacturer, even in the event of changes to the transmission interfaces or similar.

Customers must be informed about this guarantee to provide spare parts and security updates, as well as the associated security guidelines.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the contract and submit the corresponding pages of the product documentation that provide this information to customers as Annex 11 to the contract.

3.2.4 Take-back scheme for the devices and reconditioning

The applicant undertakes to take back those devices carrying the environmental label after use and to recondition them as a priority. For data protection reasons, it must be possible to fully delete the user data to enable the systems to be reconditioned. Reconditioned devices must be clearly labelled as pre-owned devices. If it is not possible to recondition them, the devices or parts of the devices must be recycled in accordance with the Electrical and Electronic Equipment Act (ElektroG). Non-recyclable parts of the devices must be disposed of with the lowest possible impact on the environment.

Compliance verification

The applicant shall declare compliance with these requirements in Annex 1 to the contract, submit a recycling strategy to RAL and state the measures taken to implement the reconditioning of the devices as a priority in Annex 12 to the contract. The deletion of data must be carried out so that access to the data by third parties via the standard system functions is no longer possible. The specific measures for the deletion of data in accordance with these guidelines shall also be stated in Annex 12. The customer information about the take-back scheme for the devices shall be enclosed with Annex 13 to the contract as an excerpt from the product documentation.

3.2.5 Recyclable design

In terms of the recyclable design of those devices issued with the environmental label, the following is valid:

- The devices must be designed so that they are easy to dismantle for recycling purposes in order to ensure that housing plastics and metals can be separated as fractions from materials of other functional units and, if possible, recycled by material type.
- The devices must be designed in such a way that they can be dismantled by specialist companies using standard tools or this process is simplified by intelligently designed connections.
- Specialist companies commissioned by the manufacturer for recycling the devices must receive information on how to dismantle the devices.
- The recycling strategy developed for the devices with respect to the above-named points and a note on reconditioning the devices as a priority must be published by the manufacturer on the internet.

¹⁴ see footnote 13

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the contract. The applicant shall also name the address of the website where the recycling strategy has been published in Annex 1 to the contract. The applicant shall submit the recycling strategy with respect to the above-named points as Annex 12 to the contract.

3.3 Material requirements

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

The plastics may not contain as constituent parts¹⁵ any substances classified as:

- a) Substances which are identified as particularly alarming under the European Chemicals Regulation REACH (1907/2006/EC) and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "list of candidates");¹⁶
- b) Substances that according to the CLP Regulation (EC) No. 1272/2008 have been classified in the following hazard categories or which meet the criteria for such classification:¹⁷
 - ◆ Carcinogenic in categories Carc. 1A or Carc. 1B
 - ◆ Germ cell mutagenic in categories Muta. 1A or Muta 1B
 - ◆ Reprotoxic (teratogenic) in categories Repr. 1A or Repr. 1B

Halogenated polymers are not permitted. Neither may halogenated organic compounds be added as flame retardants. In addition, no flame retardants classified according to the CLP Regulation as carcinogenic in category Carc. 2 or as hazardous to water in category Aquatic Chronic 1 may be added to the product.

The hazard statements (H Phrases) that correspond to the hazard categories can be found in Appendix B of these Basic Award Criteria.

The following is exempt from this rule:

- process-related, technically unavoidable impurities;
- fluoroorganic additives (e.g. anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed a proportion of 0.5 percent by mass;
- plastic parts with a mass of less than 10 grams.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the contract and submit a written declaration from the plastics manufacturer as Annex P-M to the contract or

¹⁵ Constituent components are substances added to the product as such or as part of a mixture and remain there unchanged in order to achieve or influence certain product properties. This does not apply to residual monomers that have been reduced to a minimum.

¹⁶ The version of the list of candidates at the time of application is valid. The list of candidates in its relevant version can be found under the following link: <https://echa.europa.eu/candidate-list-table>

¹⁷ The harmonized classifications and labellings of dangerous substances can be found in Annex VI, Part 3 of the CLP Regulation. Furthermore, a comprehensive classification and labelling inventory, which also includes all of the self-classifications of hazardous substances made by manufacturers, has been made available to the public on the website of the European Chemicals Agency: [ECHA classification and labelling inventory](#).

guarantee the provision of these documents to RAL gGmbH. This declaration confirms that the excluded substances have not been added to the plastics and provides a chemical description of the flame-retardant materials used including the CAS number and its rating. The applicant shall state which plastics are used in the housing for parts with a mass ≥ 10 grams and provide a list of the plastics used in the housing according to Annex P-L.

3.3.2 Information on the proportion of post-consumer recycled plastic in the housing and housing parts

The applicant must state the proportion of post-consumer recycled plastic (PCR) in the plastic for the housing and housing parts, as well as the polymers used.

Compliance verification

The applicant shall state the proportion of PCR plastic in the product based on the plastics in the housing parts in intervals of 0–1, 1–5, 5–10 percent etc. and the polymers used for the housing parts in Annex 1 to the contract.

3.3.3 Display

- The background lighting for the display must not contain any mercury.
- The liquid crystal mixtures must comply with the criteria in Paragraph 3.3.1.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the contract. The applicant shall submit a written declaration from the manufacturer of the liquid crystal substances as Annex 14 to the contract.

3.3.4 Systems using biocidal silver

The use of systems using biocidal silver ions is not permitted.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract.

3.3.5 Printed circuit boards

Chlorinated paraffins¹⁸ may not be added to the carrier material of printed circuit boards.

¹⁸ Short-chain chlorinated paraffins CAS No.: 85535-84-8; Medium-chain chlorinated paraffins (MCCPs) CAS No. 85535-85-9; Alkane, C6-18, chloro CAS No.: 68920-70-7; Alkane, C10-12, chloro CAS No.: 108171-26-2; Alkane, C10-14, chloro CAS No.: 85681-73-8; Alkane, C10-21, chloro CAS No.: 84082-38-2; Alkane, C10-26, chloro CAS No.: 97659-46-6; Alkane, C10-32, chloro CAS No.: 84776-06-7; Alkane, C12-13, chloro CAS No.: 71011-12-6; Alkane, C12-14, chloro CAS No.: 85536-22-7; Paraffins (petroleum), normal C>10, chloro CAS No.: 97553-43-0; Alkane, chloro CAS No.: 61788-76-9; Substances that could be classified as short-chain chlorinated paraffins according to the European Chemicals Agency (https://echa.europa.eu/documents/10162/13640/svhc_axv_rep_uk_pbt_sccp_20083006_en.pdf/e3e5bd7b-431b-4e82-9a4f-23b83dda0f45, accessed 02/11/2020)

Compliance verification

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

3.3.6 Electronic components

The electronic components may not contain beryllium or beryllium compounds.

The following is exempt from this rule:

- process-related, technically unavoidable impurities;
- plastic parts with a mass of less than 10 grams.

Compliance verification

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

3.3.7 Sales and delivery packaging

Paper or cardboard must account for at least 90% by mass of the total sales and delivery packaging. This must be produced using recycled fibres accounting for at least 70% by mass, a tolerance limit of 5% is permitted.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract and, if paper or cardboard are used for the packaging, verify the source of the materials and the composition of the packaging in the form of written confirmations from the suppliers and, if necessary, by providing further verification in Annex 15 to the contract.

3.4 Other

3.4.1 Voice quality

To ensure a good voice quality, the following quality standards are mandatory for all product classes, unless otherwise stated:

Telephone systems and VoIP telephones

- Acoustic echo cancellation (echo cancellation in the acoustic echo path of the handset, as well as in hands-free mode)
- Comfort noise (to prevent the impression of a "dead line" when the remote party is not speaking)
- Packet loss concealment (intelligent integration of lost voice data after packet data loss)
- Transmitted voice spectrum and codec support:
- Wideband/high definition audio (bandwidth ≥ 7 kHz)
- Supported codecs – e.g.: G.722 (optional in basic product class)
- Standard bandwidth (bandwidth: 4kHz)
- Supported codecs – e.g.: G.711, as well as G.729 for compression during signal transmission

VoIP telephones

- Full-duplex hands-free function

Compliance verification

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

3.4.2 Data security

To ensure basic security of the transmission, devices with VoIP functions must meet the following standards or use equivalent standards:

- *Encryption of the voice channel: SRTP (key length \geq 128 bit)*
- *Encryption of the signalling channel: TLS 1.2 (2008) or 1.3 (2018)*
- *Secure exchange of keys between the terminal and the telephone system (Perfect Forward Secrecy, PFS).*

Telephone systems with VoIP functions must be capable of encrypting the signals and voice communication on the SIP user side. Access to the system via a web interface must be controlled using HTTPS.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the contract or, if required, submit a declaration on the equivalence of the standard used as Annex 16 to the contract.

3.4.3 Quality/comfort requirements

Depending on the product to be certified with the Blue Angel in accordance with these criteria, either one of the following two criteria apply or both of the criteria apply if the product is a combination of a telephone system and VoIP telephones.

Telephone systems

The telephone system must be easy to place into operation, e.g. via an installation wizard and convenient to maintain, e.g. using remote maintenance. The owner of the telephone system must be able to transfer the full administration of the telephone system as desired at any time. The system must support standard interfaces to enable computer systems to access telephone functions for the purpose of integrating them into Unified Communications systems. Mobile terminals receive access to the telephone system and can be integrated into the call processes.

VoIP telephones

VoIP telephones must be easy to place into operation. For this purpose, the devices must be programmable via an administration interface (e.g. remote configuration via browser access) or support the automatic configuration of IP addresses with the router (DHCP protocol).

Compliance verification

The applicant shall submit the corresponding product documentation in which the commissioning and administration options are described (Annex 17) and declare compliance with the requirements in Annex 1 to the contract.

3.4.4 Obligation to provide information

Easy-to-understand product information must be made available for download free of charge on the Internet from the time at which the device is launched on the market through to at least 6 years after the discontinuation of the product is announced¹⁹. This information can also be optionally enclosed with the product in printed form (using at least 70% ± 5% recovered paper). Alongside the most important technical data and operating instructions, this information must include the following:

- Information on energy saving modes for the device and their settings (at least: recommended settings for power management) in accordance with Paragraph 3.1.3
- Information on the options for expanding the performance of the device in accordance with Paragraph 3.2.2
- Availability of spare parts and security updates in accordance with Paragraph 3.2.3
- Information on reparability in accordance with Paragraph 3.2.3
- Obligation to take back the devices in accordance with Paragraph 3.2.4
- Information on the publication of the reconditioning and recycling strategy in accordance with Paragraph 3.2.4
- It must be indicated that the selection of energy-efficient and resource-preserving telephones, the operation of the telephone system and user behaviour can have a significant influence on the environmental friendliness of the devices.

Furthermore, the above-mentioned information must be published on a freely accessible website that is linked via the manufacturer's website.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 to the contract and state the internet link where this information can be accessed. The applicant shall submit corresponding pages of the product documentation, which have not yet been submitted as verification for other criteria, as Annex 18 to the contract.

3.5 Overview of possible future requirements

It is recommended that a change to the scope is examined in a future revision of these Basic Award Criteria: Numerous devices can be combined in VoIP systems and these devices and other network components are increasingly communicating with one another in an intelligent way. All of this is controlled by a server, as is also common for servers in PC networks. All devices equipped with a microphone and speaker that can participate in IP-based communications services are capable of being used for telecommunications purposes. It is conceivable that the future Basic Award Criteria will not be developed for certain hardware devices but rather for VoIP systems. Cloud-based telephone systems could possibly be taken into account. In this context, any overlaps and boundaries between these criteria and Wi-Fi telephone products as well as products that come under the scope of digital cordless phones (DE-UZ 131) will also be assessed.

¹⁹ see footnote 13

In particular, there will be greater focus placed on data security in the future, which is why the criteria in this area will also be expanded in future revisions. In future, it is assumed that there will be greater scope for energy efficiencies in the software and transmission protocols rather than in the hardware devices that are certified with the criteria in this edition of the Basic Award Criteria.

4 Applicants and Parties Involved

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

Parties involved in the award process are:

- RAL gGmbH to award the Blue Angel Environmental Label,
- the federal state being home to the applicant's production site,
- Umweltbundesamt (German Environmental Agency) which after the signing of the contract receives all data and documents submitted in applications for the Blue Angel in order to be able to further develop the Basic Award Criteria.

5 Use of the Environmental Label

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

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

Contracts on the Use of the Environmental Label are concluded to fix the terms for the certification of products under Paragraph 2. Such contracts shall run until December 31, 2025.

They shall be extended by periods of one year each, unless terminated in writing by March 31, 2025 or March 31 of the respective year of extension.

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

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

The Contract on the Use of the Environmental Label shall specify:

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

Appendix A Measurement guidelines for determining the energy consumption

The measurements must be carried out in *idle mode* with the maximum connections on the port modules. The energy consumption values cannot be used to determine the actual energy consumption of a real telephone system.

The telephone system must be fully equipped, i.e. all of the slots must be fitted with plug-in modules. However, no peripheral devices (i.e. no terminals) should be connected to the ports on the plug-in modules and the Ethernet interfaces on the device. The active SIP trunk line connected to the system should be in *idle mode*.

The following modules should be fitted to the slots of the system (if available for the telephone system):

- A plug-in module for the connection of analogue terminals (the number of analogue terminals is A)
- The remaining slots should be fitted with plug-in modules for the connection of system telephones (number of connectible terminals: T). If the system does not have any plug-in modules for system telephones, any free slots should be fitted with other available plug-in modules, which are typically designed for the operation of peripheral devices. The number of periphery devices operated on all of these plug-in modules is subsumed under T. As an alternative to the maximum equipping of the system, it is permitted to use the number of plug-in modules that are required for the typical operation of this telephone system according to the system manual.
- The number of VoIP terminals I is defined as the difference between the maximum number of users N of the system according to the system manual and the sum of the connectible periphery devices on the plug-in modules: $I=N-(A+T)$
- The maximum number of terminals N for the system is thus calculated from the sum of all connected terminals in the context of these measurement guidelines: $N=A+T+I$

The measurements are carried out in *idle mode*.

Appendix B Assignment of hazard categories and H Phrases

The following table assigns the hazard categories for the general exclusion of substances to the corresponding hazard statements (H Phrases).

Table 1: Hazard categories and H Phrases

CLP Regulation (EC) No. 1272/2008		
Hazard category	Hazard statements	
	H Phrases	H Phrases
Carcinogenic substances		
Carc. 1A Carc. 1B	H350	May cause cancer.
Carc. 1A Carc. 1B	H350i	May cause cancer if inhaled.
Carc. 2	H351	Suspected of causing cancer.
Germ cell mutagenic substances		
Muta. 1A Muta. 1B	H340	May cause genetic defects.
Reprotoxic substances		
Repr. 1A Repr. 1B	H360D	May damage the unborn child.
Repr. 1A Repr. 1B	H360F	May damage fertility.
Repr. 1A Repr. 1B	H360FD	May damage fertility. May damage the unborn child.
Repr. 1A Repr. 1B	H360Df	May damage the unborn child. Suspected of damaging fertility.
Repr. 1A Repr. 1B	H360Fd	May damage fertility. Suspected of damaging the unborn child.
Environmental hazards		
Aquatic Chronic 1	H410	Very toxic to aquatic life with long-lasting effects.