BLUE ANGEL

The German Ecolabel

Telephone Systems

DE-UZ 183

Basic Award Criteria

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Version 3

The Environmental Label is supported by the following four institutions:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

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

Umwelt Bundesamt

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

Jury Umweltzeichen

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

RAL gGmbH

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

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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 (POTS = Plain Old Telephone Service), via the digital telecommunications network (ISDN = Integrated Services Digital Network) and increasing in recent times via internet connections (IP = Internet Protocol).
Classic PBX telephone systems (PBX = Private Branch Exchange) can handle a wide range of possible users from one to multiple thousands. 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. Larger systems for > 8 users are often installed commercially in small businesses and companies.
PBX telephone systems that are primarily installed in private households are generally small devices with minimal power consumption. In general, these PBX boxes installed in private households are then only replaced very rarely so that for this reason and also because of their small size, their energy and resource consumption only play a minor role.
In contrast, telephone systems installed for commercial use can, depending on their size, exhibit increased energy consumption that can be reduced due to intelligent power management systems and the optimal arrangement of the hardware components. Larger telephone systems installed for commercial use also require a significant amount of hardware that contains valuable materials. The hardware found in telephone systems generally has a long service life. From the prospective 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.

1.3 Outlook for developing technologies

Telecommunications via internet connections (IP technology) - instead of via the analogue or digital telephone network - are becoming increasing important. It is expected that standard switching technology will be replaced in the medium term by IP technology.
There are different technological approaches found on this migration path:

- Hybrid telephone systems based on proprietary hardware:
  On the one hand, these systems allow the use of traditional telephones and periphery devices like such as analogue DECT or Fax devices due to their hardware equipment. On the other hand, an open software platform (standard operating system) enables the use of software that facilitates the functionality of the telephone system.
- Software-based telephone systems based on standard server components: Voice-over-IP telephone systems are already being increasingly used today. In principle, these systems can be described as virtual telephone systems because the "telephone system" is made up of software. The software is integrated into servers and PCs meaning that the high use of hardware in traditional telephone systems becomes obsolete. These purely virtual telephone systems do not allow the use of traditional analogue periphery components such as analogue DECT or Fax devices unless an interface adapter (hardware components or hardware plug-in cards) are used in the standard server or PC.

Traditional and hybrid telephone systems currently offer the advantage over pure VoIP telephone systems that certain application functionalities have been tailored to the existing hardware or that their integration into already existing infrastructures is indispensable for many users. In contrast, VoIP technology offers a high degree of flexibility and scalability through communication applications. Therefore, it is expected that traditional telephone systems will be replaced to a large extent by VoIP technology in the course of the restructuring of existing, established communication infrastructures. In these types of migration scenarios, hybrid systems represent a particularly attractive option because they can be integrated into the existing hardware structures.

1.4 Environmental aspects

The minimisation of energy consumption is an important environmental goal for preserving resources and protecting the climate. Telephone systems installed for commercial use are generally operated 24 hours a day and 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 goal of environmental protection, the energy consumption of the relevant telephone system used in a company should be be reduced to the lowest level technically possible within the framework of the customer's requirements. It is true that the energy consumption of a telephone system is also partly determined by the periphery devices connected and the manufacturer of the telephone system has limited influence in this area. Nevertheless, the energy consumption of the telephone system itself can be reduced through the use of power supply units with high efficiency levels (switched-mode power supply units), 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 individual parts and through the high-quality recycling of valuable material components.

The environmental label should identify telephone systems that stand out due to the following environmental criteria:

- 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, updatability/scalability of software, modular nature of hardware)
- Optimised and the lowest possible energy consumption
- Avoidance of environmentally harmful substances and materials

1.5 Objective of the environmental label

The "Blue Angel" eco-label for telephone systems should inform customers purchasing these types of devices that products issued with this label - in contrast to other products - take greater preventative measures for the purposes of environmental and consumer protection. Therefore, the eco-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 optimised devices with the lowest possible energy consumption, while also allowing them to inform customers about this aspect of the product characteristics in a simple way.

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

1.6 Compliance with legal requirements

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

- The EU directives 2002/96/EC[1] and 2002/95/EC[2] implemented in German law in the Electrical and Electronic Equipment Act (ElektroG)[3] are observed. Any additional requirements placed on materials as a precautionary measure are observed.
- The EU directive 2006/66/EC[4] transposed into German law by the German Batteries Act (BattG)[5] is observed.

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1 Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment

2 Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment, OJ no. 37, 13.02.2003

3 Law for the sale, return and environmental disposal of electrical and electronic equipment, BGBl, 2005, Part I, no. 17 (23.05.2005)

4 Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators, OJ no. L 339, Page 39, 2007, No. L 139 Page 40

5 German Batteries Act from 25.06.2009 BGBI I S. 1582

- The substance requirements defined by the EU Chemicals Regulation REACH (1907/2006/EC)[6] and Regulation EC No. 1272/2008[7] (or Directive 67/548/EEC) are observed.
- The EU directive no. 278/2009[8] (power supply directive) for the case that the device is delivered with an external power supply unit that is covered by the directive.
- The R&TTE directive (directive 1999/5/EC on telecommunications terminal equipment and the mutual recognition of their conformity), transposed into German law in the Radio and Telecommunications Terminal Equipment Act (FTEG)
- The law about supplying products to the market (German Equipment and Product Safety Act - ProdSG)

1.7 Operating modes / definitions

- **Low Power Mode**: Energy saving mode with a reduced energy consumption in comparison to idle mode.
- **Idle Mode:** In Idle Mode, the telephone system is in an idle state from which it can be immediately activated (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.
- **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.

1.8 Glossary

- **BRI:** Basic Rate Interface describes the standard ISDN connection with two voice channels each with 64 kbit/s and one D-channel with 16 kbit/s for signalling.
- **Collaboration function:** Web collaboration supports the joint creation of documents between users at different workstations and locations. The following features and services are generally supported:
  - **Selection of applications:** Allows users to select applications that can be shown to other users.
  - **File exchange:** Users can load documents into the file storage area and define those users who are permitted to download the files.
  - **Chat function**: Permits users to communicate with all other users by text message.

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[6] 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

[7] 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

[8] Commission regulation (EU) No 278/2009 of 06 April 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies

- **Whiteboard:** Enables users to create sketches on a virtual flip chart and save them as a file for later use.
- **Remote operation:** Comprises online support and remote operation tools for administration, maintenance and desktop sharing (sharing the screen with others) on external PC's and servers.
- **Session recording:** The web conference session can be recorded and saved via a secure mechanism.

- **Contact centre / call centre function:** Application for distributing calls, faxes and e-mails and handling calls, faxes and e-mails by contact centre agents. The following or similar performance features are available:
  - Handling of voice calls, faxes and e-mails
  - Callback function for agents
  - Displaying and altering the status of the agent
  - Displaying and altering the presence status of internal users of the communication system
  - Illustrating queues in real time
  - Recording of calls, if this feature is activated in the communication system
  - Requesting support via: listening in to calls, connecting to calls, Instant Messaging
  - Integration of company directories to enable name searches
  - Creating of reports based on pre-defined report templates
- **DECT:** Digital Enhanced Cordless Telecommunications is a European standard for cordless digital voice and data communications for telephones and local mobile communication systems. It allows connection to ISDN and can be used in telephone systems (PBX). It is also possible to combine DECT with mobile phone networks according to the GSM standard (Global System for Mobile Communications) for fully digital mobile phone networks.
- **FXS:** Foreign Exchange Subscriber or Foreign Exchange System is a standard interface in analogue telephone systems.
- **FXO:** Foreign Exchange Office describes all devices that are connected to the telephone system that behave as terminals (fax machines, telephones, etc.). An FXO device must always be connected to an FXS interface.
- **Hybrid telephone system (Hybrid PBX):** An exchange system that supports both IP-based and ISDN-based interfaces for connection to both the trunk line and communication terminals.
- **Instant Messaging** (sending messages to all or individual conversation partners). Instant Messaging (IM) is a process for the real-time exchange of text messages via the internet or the in-house communication network with the aid of PCs, pocket PCs and (mobile) telephones. Modern IM services make use of the presence function for address lists for the purpose of addressing the message and, depending on the focus of the manufacturer, also supporting the process of changing or extending the communication service to another in the areas of voice, video, file transfer and desktop application sharing (sharing your own screen and certain applications with other users).
- **IP:** Internet Protocol.
- **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.

- **Conference support** (conferences, conference room function): In a conference, multiple users can communicate with one another simultaneously by telephone. The initiator of the conference has several options available for setting up the conference. Examples:
  - **Ad hoc conferences:** An ad hoc conference is manually initiated by dialling the telephone and also manually ended.
  - **Planned conference:** A planned conference is controlled by a conference management application according to a time schedule.
  - **Conference room:** Conference applications offer the functions of a virtual conference room: The presence or absence of a conference participant can be signalled graphically or acoustically. In addition, other contact information about the participants can also be displayed.
- **OSI:** Open Systems Interconnection (OSI) enables communication in heterogeneous networks, particularly between different computer platforms, on the basis of application services. The basic services include e.g. file transfer, virtual terminals, remote access to files and the exchange of electronic mail.
- **Presence:** The term "Presence" describes the ability of a Unified Communications system to determine at any time by which communication method and which terminal a user can be reached together with their relevant status (not available, in a meeting, returning shortly, etc.).
- **PRI:** Alongside BRI, the Primary Rate Interface describes a type of interface in the ISDN network.
- **PBX:** Private Branch Exchange describes an internal telephone system in which terminals such as telephones, fax machines and answering machines are connected with each other and also with the public telephone network.
- **RAM:** Random Access Memory (RAM) is a form of data storage that is used as run-time memory. The size of the RAM storage memory is a determining factor for the performance capability of the telephone system.
- **SIP trunking interface:** 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 (Voice over IP (VoIP)). The SIP trunking interface is an interface for bundling SIP data packages.
- **System telephones:** Telephones that use a standardised physical transfer interface (layer 1 according to the OSI model) to connect with the switchboard via a proprietary signalling protocol (layers 2 and 3 according to the OSI model) or are directly connected via a proprietary physical transfer interface.
- **TDM telephone system (TDM PBX):** An exchange system that supports only ISDN-based interfaces for connection to both the trunk line and communication terminals.

- **Telephone system (PBX):** An exchange system between lines on the public telephone network (trunk lines) and communication terminals.

  Unified Communications: Unified Communications (UC) describes the integration of communication media into a uniform application environment. Combining all communication services (real-time services like voice and video and non-real-time services like e-mail) and integrating them with the presence function, which is a familiar function to Instant Messaging users, should improve and accelerate the reachability of communication partners who need to share work. This principle must be used as a criterion for determining whether the characteristics of a PBX telephone system allow it to be classified in the category "Unified Communications" because of the diverse range of application options. In certain cases, any missing functionality can be substituted by features that offer a similarly high-quality advantage.

  Elements of Unified Communications (UC): Unified communications as a technology and a concept can be subdivided into four core areas that describe unified communications in principle:

  - **Media integration:** UC is based on the integration of different media or communication services using a logical, technical control layer. In a technical sense, UC is based here on IP technology but can also integrate traditional and mobile telecommunication devices and systems (e.g. ISDN). A rule-based management system supports the user in the administration and selection of suitable media for each individual situation. A logical control layer ensures that incoming communication processes are automatically transferred to the preferred available terminal for the user's current situation. This requires that all media (text, audio, video), terminals (mobile telephones, IP telephones, etc.) and software clients(Instant Messenger, video and audio clients) are registered and configured in the UC system. The rules defined in the system can be complex: They can refer to individual callers, times of the day and different terminals.
  - **Presence information:** Presence information signals the availability of a contact person, e.g. in a software application, with a corresponding symbol. In contrast to Instant Messaging, UC enables significantly more complex forms of signalling. This means the presence status can be determined and displayed in detail down to the level of different terminals. An initiator can thus see whether a recipient is currently reachable e.g. by telephone. Furthermore, the presence status of persons can be pooled at a group level or added to any objects (e.g. files) in other software applications. Monitoring the presence status at a group level makes it possible e.g. to receive information about the reachability of all members of the group if a telephone conference is to be convened.
  - **Context integration:** The integration of UC solutions into the work environment of the user e.g. making presence information available in third party applications and processes and the opportunity to initiate communication directly from third party applications. For example, whenever the name of a user registered in the UC system appears in an application (e.g. as the author of a document) along with their presence status, then communication e.g. via IP-based video conference can be initiated with just one click. A second aspect of context integration is the integration of a work

environment in the reverse direction: The linking of relevant data, tools and processes with the communication itself is possible (e.g. the automatic provision of customer data alongside the incoming contact from the customer).

- **Other cooperation functions:** Enhancement of communication in UC through cooperation functionality e.g. system-orientated switchable web conferencing, whiteboard and application sharing facilities (enabling e.g. ad hoc collaboration on documents outside of the respective work environment)

- **USB:** The Universal Serial Bus is a system for connecting a device to external computers.
- **Video:** Support for point-to-point video connections and three-way video conferences. It is possible to integrate video services into the presence evaluation for a user.
- **Voice over IP** (also VoIP, IP telephony) describes telephoning via the internet or computer network.
- **WAN connection**: A Wide Area Network describes the connection of multiple local networks (LAN). For example, a connection between the local networks of different branches of a company.

2 Scope

These Basic Award Criteria are valid for telephone systems designed for 8 to 500 users. Excluded are those routers with telephone system functions for which their own basic award criteria (DE-UZ 160) exist, as well as individual large systems with a possible number of users greater than 500.
The scope of this eco-label covers telephone systems that are individual devices. Equipment that does not belong to the telephone system and is therefore not included within the scope of the eco-label are those periphery devices such as communication terminals (e.g. analogue or ISDN telephones, SIP-based VoIP telephones or fax machines), firewalls/VPNs and the power supply units for periphery devices (e.g. switches for VoIP telephones) because this equipment is primarily selected independently of the telephone system.

3 Requirements

3.1 Requirements for the preservation of resources and product durability

3.1.1 Hardware adaptability

In the case of telephone systems with connection options for more than 50 users, the telephone system must be scalable to incorporate further users. Insofar as this is not possible through adaptations to the software, the scalability of the number of users is to be supported through the modular design of the hardware. This can be achieved through the use of easily replaceable individual modules within a device (rack plug-in mounting) and/or the easy connection or separation of multiple telephone systems with one another or through comparable measures that fulfil the same functions (simple adaptation of the required number of users).

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 and submit the corresponding pages of the product documentation as Annex 8. Insofar as the possibilities for adapting the hardware are not clearly explained in the product documentation, the applicant shall provide a description and explanation in Annex 2.

3.1.2 Software adaptability

The software is to be designed so that it supports the scalability of the telephone system in order to incorporate technical enhancements to the hardware and enable the best possible integration of connected devices.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 and submit the corresponding pages of the product documentation as Annex 8.

3.1.3 Ease-of-repair and provision of spare parts

The telephone systems shall be constructed in such a way that they can be repaired through the replacement of individual faulty modules (e.g. circuit boards).
The applicant undertakes to make sure that the supply of spare parts for the repair of the devices is guaranteed for at least 5 years following the termination of production.
Spare parts are those parts which, typically, may break down within the scope of the ordinary use of a product. Other parts which normally exceed the life of the product are not to be considered as spare parts.
The product documentation shall include information on the above requirements.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 and submit the corresponding pages of the product documentation as Annex 8.

3.1.4 Recyclable Design

Products carrying the Blue Angel eco-label must meet the following requirements for recyclable design:

- The devices shall be designed so that they allow an easy disassembly for recycling purposes to make sure that housing plastics and metals can be separated as fractions from materials of other functional units and, if possible, be recycled.
- The devices shall be designed so that they support specialist disassembly by intelligently designed connections or allow disassembly by use of ordinary tools.
- Specialist firms hired by the manufacturer for device recycling shall receive information for device disassembly.
- The manufacturer shall publish the device recycling strategy developed with respect to the above points on the Internet.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 and submit the extract that includes the statement about the recycling strategy in Annex 5. The applicant shall name the address of the website where the recycling strategy has been published.

3.1.5 Return of devices, reconditioning and recycling

The applicant undertakes to take back those devices carrying the eco-label after use and to recondition them as a priority. For data protection reasons, it must be possible to 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 are to be recycled in accordance with the Electrical and Electronic Equipment Act (ElektroG). Non-recyclable parts of the devices are to be disposed of with the lowest possible impact on the environment.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract, submit a recycling strategy to RAL, as well as the measures taken to implement the reconditioning of the devices as a priority in Annex 5. 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 concrete measures for the deletion of data in accordance with these guidelines shall be submitted as Annex 6. The customer information about the return of the devices is enclosed with Annex 8 to the Contract as an excerpt from the product documentation.

3.2 Material requirements

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

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

a) carcinogenic in categories 1 or 2 according to Table 3.2 of Annex VI to EC Regulation 1272/2008[9]
b) mutagenic in categories 1 or 2 according to Table 3.2 of Annex VI to EC Regulation 1272/2008

[9] 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, Annex VI on harmonized classification and labelling of hazardous substances, Part 3: Harmonized classification and labelling, Tables, Table 3.2, – List of harmonized classification and labelling of dangerous substances from Annex I to Directive 67/548/EEC short: GHS Regulation http://www.reach-info.de/ghs_verordnung.htm, each as amended.
The GHS Regulation (Global Harmonization System) that has come into force on January 20, 2009, replaces the old Directives 67/548/EEC and 1999/45/EC. According to the said regulation, substances are classified, labelled and packed until December 1, 2010 according to Directive 67/548/EEC (Dangerous Substances Directive) while mixtures are classified, labelled and packed until June 1, 2015 according to Directive 1999/45/EC (Dangerous Preparations Directive). Notwithstanding this, the classification, labelling and packaging of substances and preparations may be performed according to the provisions of the GHS Regulation already before December 1, 2010 or June 1, 2015, respectively. In such case, the provisions of the Dangerous Substances Directive or Dangerous Preparations Directive shall not be applicable.

c) reprotoxic in categories 1 and 2 according to Table 3.2 of Annex VI to EC Regulation 1272/2008
d) particularly alarming for other reasons according to the criteria of Annex XIII to the REACH Regulation, insofar as they are included in the List (so-called "list of candidates"[10]) set up in accordance with REACH, Article 59, Paragraph 1

Halogenated polymers shall not be permitted. Neither may halogenated organic compounds be added as flame retardants. In addition, the use of flame-retardant materials that are rated as acutely toxic to aquatic organisms with long-term effects according to Tables 3.1 or 3.2 of Annex VI of EC regulation 1272/2008 and classified with the hazard statement code H410 or with the risk phrase R50/53 is prohibited.

The following shall be exempt from this rule:
- fluoroorganic additives (e.g. anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed a proportion of 0.5 percent by mass
- plastic parts with a mass of less than 25 grams

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 and submit a written declaration from the plastics manufacturer as Annex P-M or guarantee the provision of these documents to RAL gGmbH. The declaration in Annex P-M and Annex P-L25 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 ≥ 25 grams and provide a list of the plastics used in the housing according to Annex P-L25.

3.2.2 Packaging

The plastics used is to be labelled in accordance with the German Packaging Ordinance in its current version.

Compliance Verification

The applicant shall declare compliance with the requirement and provide information on the labelling of the plastics used in the packaging in Annex 7 to the Contract.

3.3 Special requirements for the device

3.3.1 Energy consumption

Telephone systems can be classified, amongst other things, according to the performance level of their central control system, their scalability on the basis of open operating systems and their size in different device classes. For the purposes of these Basic Award Criteria, the telephone systems will be classified into two device categories (depending on the size of the system's RAM memory) and into five different setup levels.

[10] Link to the list of candidates of Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH): http://echa.europa.eu/web/guest/candidate-list-table

If the design of the telephone system focuses on the development of Unified Communications then the relevant figure is to be increased by 20% in each case.
The design of a telephone system is considered to focus on Unified Communications if it features at least five of the following functions (see Glossary for definitions):

- Presence information
- Support for conferences (minimum of 5 participants)
- Instant Messaging
- Video
- Contact centre function
- Collaboration function

A differentiation is made between Low Power Mode, Idle Mode and Active Mode in the measurements for energy consumption. The average energy consumption is given in kWh per year per port (user).

Table 1: Maximum permissible energy consumption for the device category at the relevant setup levels in kWh per year per port

	Setup level 1	**Setup level 2**	**Setup level 3**	**Setup level 4**	**Setup level 5**
Users	8 – 20	21 – 50	51 – 150	151 – 250	251 – 500
System memory RAM < 1 GByte	4	3	2	1.5	1.5
System memory RAM > 1 GByte	9	7.5	4.5	3.5	2.5

The normalised energy consumption for each port in the system must be less than or the same as the figure stated in Table 1 for the defined yearly load cycle. The measurement setup and load cycle are described in Annex 1.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract. The applicant shall allocate the device to the corresponding category and setup level stated in the printed form for Annex 3 and state the energy consumption per year and per port in the load cycle and provide information on the individual values for Low Power Mode, Active Mode and Idle Mode. The applicant shall submit a test report as Annex 4 to the Contract from a test institute accredited in accordance with DIN EN ISO/IEC 17025 for the electrical testing. Product documentation shall be submitted in Annex 8 as verification of UC functionality.

3.3.2 Power management

The telephone system must have an active power management system. The active power management system enables the telephone system to switch between Low Power Mode and the other operating modes (Active Mode, Idle Mode) depending on the load status. In principle, the user must be able to configure the switching conditions.

Compliance Verification

The applicant shall submit the corresponding product documentation and declare compliance with the requirements in Annex 1.

3.4 Quality / comfort requirements

The telephone system, the operating system and the software must be as simple as possible to install e.g. via an installation wizard and easy to maintain e.g. via 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.

Compliance Verification

The applicant shall submit the corresponding product documentation and declare compliance with the requirements in Annex 1.

3.5 Technical requirements

In order to guarantee the security of the telephone system, it must be capable of encrypting the signals and voice communication on the SIP user side.
Migration to the IPv6 communication protocol must be supported.
Hybrid or IP-based systems must support SIP-based standard VoIP telephones and offer connection options for devices conforming to DE-UZ 150.
Hybrid PBX systems must support IP interfaces for the trunk line and the user terminal. The SIP Trunking Interface must have been tested and certified by a number of VoIP service providers (ITSPs) in Germany.
Telephone systems in setup levels 3-5 must be able to support a TDM PRI interface.

Compliance Verification

The applicant shall submit the corresponding product documentation as Annex 8 and declare compliance with the requirements in Annex 1.

3.6 Consumer information

Insofar as the device is delivered together with documentation in printed form, this should be preferably printed on recycled paper that where possible carries the "Blue Angel" eco-label. The operating instructions or product information provided to the customer when purchasing the device must include the following information that is described for the user in an understandable and clear manner:

- Information on the energy-efficient use of the device (minimum: recommended settings for the power management system)
- The product documentation must indicate that the selection of energy-efficient and resource-preserving telephones can have a significant influence on the environmental-friendliness of the operator of the telephone system. Energy-efficient and resource-preserving VoIP telephones are those, for example, that comply with the requirements in the basic award criteria for DE-UZ 150. The same is true for standard telephones, although these types of telephones are exempt from the requirements for energy consumption given in DE-UZ 150.
- Possibility of adapting the functionality of the system in accordance with 3.1.1 and 3.1.2
- Repairability in accordance with 3.1.3

- Information on the publication of the reconditioning and recycling strategy in accordance with 3.1.5

In addition, the information listed above is to be published on a freely accessible internet site that can be easily accessed via the manufacturer's own internet site.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract, state the Internet link where this information can be accessed and submit the corresponding pages of the product documentation as Annex 8.

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, 2020. They shall be extended by periods of one year each, unless terminated in writing by March 31, 2020 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 energy consumption

In principle, the measurement guidelines are a model to enable a comparison between different PBX modules from different manufacturers. Therefore, a normalisation per port (maximum number of connectible telephones = M in the relevant manufacturer setup) is also carried out so that it is not necessary to take account of the manufacturer-specific product segmentation. The measurements are thus carried out with the maximum connections on the port modules. Therefore, the calculated energy consumption values per port are exclusively designed for the purposes of comparison and to quantify energy efficiency in relation to the limit values stated in the Basic Award Criteria. The energy consumption values cannot be used to determine the actual energy consumption of a real telephone system.

The measurement of the energy consumption for the relevant device is carried out using a 230 volt power supply. If an external power supply unit is part of the scope of delivery for the device, this power supply unit is to be used. The connected telephone terminals are to be powered via their own power supply units. Insofar as this is not possible, the energy consumption for the telephones is to be removed from the calculations for the measured energy performance levels for the device.
A connection to a ISDN trunk line is to be made for the measurements. Hybrid PBX systems are also to be exclusively connected via a TDM.
Systems in setup level 1 are to be connected via a BRI interface, while systems in setup levels 2-5- are to be connected via a PRI interface.

The energy consumption of the telephone system is to be measured in Low Power Mode, Idle Mode and Active Mode; each measurement is to be taken over a period of ten minutes.

In the measurements for Idle and Low Power Modes, the time since the telephone system was last activated (Active-mode) must be at least 30 minutes. Depending on the type and size of the device, connections (measurement setup) are to be made to the telephone system as illustrated in Table 3 for carrying out the measurement in Idle Mode.
In this process, a minimum of two analogue and two standard S0-ISDN terminals are to be switched on for all setup levels. Depending on the configuration options of the relevant system, the remaining terminals should be TDM standard devices/system telephones or VoIP standard devices/system telephones in line with the following guidelines[11].
Connections are to be made to the required number of peripheral components to achieve the correct number of connected ports "M" (analogue, TDM/ISDN and IP connections) for the relevant setup level (compare to Tables 4 and 5).
In this process, the user terminals to be connected to the system according to Table 3 are to be distributed as evenly as possible across the required number of port components so that every required peripheral component is connected with at least one corresponding user terminal (analogue/TDM/VoIP). If alongside standard ISDN components and peripheral VoIP switching components, the manufacturer also possesses peripheral components for switching proprietary TDM user terminals then at least one of these components is to be connected and equipped with a corresponding user terminal in order to reach the correct number of connected ports "M" for the desired setup level.

[11] If system telephones are part of the telephone system then these telephones are to be used.

Specification for Idle and Low Power Mode status (if available on system):

- **Central unit**: no active connection
- **WAN connection:** connected and synchronised, no active user connection
- **Trunk BRI/PRI:** connected and synchronised, no active user connection
- **LAN ethernet ports:** ports not connected, insofar as it is not required for the correct number of connected ports "M"
- **WiFi:** active, no terminals registered
- **FXS:** device switched on by hanging up the receiver (Idle Mode)
- **Standard ISDN devices:** device switched on by hanging up the receiver (Idle Mode)
- **VoIP devices:** device switched on by hanging up the receiver (Idle Mode)
- **Proprietary TDM device:** device switched on by hanging up the receiver (Idle Mode)
- **FXO:** no active user connection, caller identification activated
- **DECT:** no active user connection, caller identification activated
- **USB:** Inactive

The connections used for Idle Mode should be retained for the measurements carried out in Active Mode and Low Power Mode. The named periphery devices per component for the relevant measurements in Active Mode are to be placed into an active state; in the event of an odd number of connected terminals, a freely selectable additional TDM terminal should be connected to ensure that every terminal activated has a connection partner.

Specification for Active Mode status (if available on system):

- **Central unit:** active connections via switched on terminals
- **WAN connection:** connected and synchronised, no active user connection
- **Trunk BRI/PRI:** connected and synchronised, no active user connection
- **LAN ethernet ports:** Ports not connected, insofar as it is not required for the correct number of connected ports "M"
- **WiFi:** active, no terminals registered
- **FXS:** device switched on with prescribed number of active connections when receiver lifted (off hook)
- **Standard ISDN devices:** device switched on with prescribed number of active connections when receiver lifted (off hook)
- **VoIP devices:** device switched on with prescribed number of active connections when receiver lifted (off hook)
- **Proprietary TDM device:** device switched on with prescribed number of active connections when receiver lifted (off hook)
- **FXO:** no active user connection, caller identification activated
- **DECT:** no active user connection, caller identification activated
- **USB:** inactive

The measured energy consumption is to be normalised according to the actual number of available ports for the setup level being tested. The yearly energy consumption is to be calculated with 30 % in Idle Mode, 30 % in Low Power Mode and 40 % in Active Mode.

Energy consumption E(kWh/a) in load cycle:

$$\mathbf{E(kWh/a) = (P_{active} * 8760h * 40/100) + (P_{idle} * 8760h * 30/100) + (P_{low\_power} * 8760h * 30/100}$$

Normalised by number of ports = E (kWh/a)/manufacturer setup M

Table 3: Measurement setup for the power consumption (kWh/a per port) of the telephone system

Criteria	Setup level 1	Setup level 2	Setup level 3	Setup level 4	Setup level 5
Number of users N	8 – 20	21 – 50	51 – 150	151 – 250	251 – 500
Measurement setup (number of port connections)	50%	16	30	35	40
Connections for measurement setup and measurement of Idle and Low Power Modes: connected ports	Analogue/FAX (2) S0 ISDN (2) TDM/VoIP/System telephone (remaining); evenly distributed across peripheral components	Analogue/FAX (2) S0 ISDN (2) TDM/VoIP/System telephone (remaining); evenly distributed across peripheral components	Analogue/FAX (2) S0-ISDN (2) TDM/VoIP/System telephone (26); evenly distributed across peripheral components	Analogue/FAX (2) S0-ISDN (2) TDM/VoIP/System telephone (31); evenly distributed across peripheral components	Analogue/FAX (2) S0-ISDN (2) TDM/VoIP/System telephone (36); evenly distributed across peripheral components
Measurement of Active Mode Active user terminals	Analogue/FAX (1) S0 ISDN (1) TDM/VoIP/System telephone: one (1) active connection of a terminal for each peripheral component	Analogue/FAX (1) S0 ISDN (1) TDM/VoIP/System telephone: one (1) active connection of a terminal for each peripheral component	Analogue/FAX (1) S0-ISDN (1) TDM/VoIP/System telephone: one (1) active connection of a terminal for each peripheral component	Analogue/FAX (2) S0-ISDN (2) TDM/VoIP/System telephone: one (1) active connection of a terminal for each peripheral component	Analogue/FAX (4) S0-ISDN (4) TDM/VoIP/System telephone: one (1) active connection of a terminal for each peripheral component

Table 4: Examples for the connections on a pure TDM telephone system

Criteria	Setup level 1	Setup level 2	Setup level 3	Setup level 4	Setup level 5
Number of users N	8 – 20	21 – 50	51 – 150	151 – 250	251 – 500
Manufacturer setup M	4+4+1*8=16	4+4+1*16=24	4+4+5*16=88	4+4+10*16=168	4+4+20*16=328
Trunk I/F type	BRI	BRI	PRI	PRI	PRI
Measurement setup (number of ports connected)	8	16	30	35	40
Connected equipment TDM users REQUIREMENT	Analogue/FAX (2) S0 ISDN (2) TDM/System telephone (remaining=4); evenly distributed across one further TDM peripheral component	Analogue/FAX (2) S0 ISDN (2) TDM/System telephone (remaining=12); evenly distributed across one further TDM peripheral component	Analogue/FAX (2) S0-ISDN (2) TDM/System telephone (26); evenly distributed across 5 further TDM peripheral components	Analogue/FAX (2) S0-ISDN (2) TDM/VoIP/System telephone (31); evenly distributed across 10 further TDM peripheral components	Analogue/FAX (2) S0-ISDN (2) TDM/VoIP/System telephone (36); evenly distributed across 20 further TDM peripheral components
Trunk type	BRI	BRI	PRI	PRI	PRI
Connected components: analogue, ISDN	1 combi-module - 4 analogue ports - 4 ISDN ports	1 combi-module - 4 analogue ports - 4 ISDN ports	1 combi-module - 4 analogue ports - 4 ISDN ports	1 combi-module - 4 analogue ports - 4 ISDN ports	1 combi-module - 4 analogue ports - 4 ISDN ports
Connected components: TDM	1 TDM module with 8 ports	1 TDM module with 16 ports	5 TDM modules with 16 ports	10 TDM modules with 16 ports	20 TDM modules with 16 ports
Measurement of Active Mode Active user terminals	Analogue/FAX (1) S0 ISDN (1) TDM/System telephone (2) to one additional TDM component (+1 extension because of call partner)	Analogue/FAX (1) S0 ISDN (1) TDM/System telephone (2) to one additional TDM component (+1 extension because of call partner)	Analogue/FAX (1) S0-ISDN (1) TDM/System telephone (6) to 5 additional TDM components (+1 extension because of call partner)	Analogue/FAX (1) S0-ISDN (1) TDM/System telephone (10) to 10 additional TDM components	Analogue/FAX (1) S0-ISDN (1) TDM/System telephone (20) to 20 additional TDM components

Table 5: Examples for the connections on a hybrid telephone system

Criteria	Setup level 1	Setup level 2	Setup level 3	Setup level 4	Setup level 5
Number of users N	8 – 20	21 – 50	51 – 150	151 – 250	251 – 500
Manufacturer setup M	4+4+1*8=16	4+4+1*16=24 +16 IP =50	4+4+1*16=24 +126 IP=150	4+4+1*16=24 +226 IP = 250	4+4+1*16=24 +476 IP = 500
Trunk I/F type	BRI	BRI	PRI	PRI	PRI
Measurement setup (number of ports connected)	50% of M = 8	16	30	35	40
Connected equipment TDM users REQUIREMENT	Analogue/FAX (2) S0 ISDN (2) TDM/VoIP/System telephone (8); System supports no proprietary TDM telephones in this setup level	Analogue/FAX (2) S0 ISDN (2) TDM/VoIP/System telephone (21); evenly distributed across one further TDM peripheral component (10) and VoIP ports	Analogue/FAX (2) S0-ISDN (2) TDM/System telephone (26); evenly distributed across one further TDM peripheral component (13) and VoIP ports	Analogue/FAX (2) S0-ISDN (2) TDM/VoIP/System telephone (31); evenly distributed across one further TDM peripheral component (15) and VoIP ports	Analogue/FAX (2) S0-ISDN (2) TDM/VoIP/System telephone (36); evenly distributed across one further TDM peripheral component (18) and VoIP ports
Connected IP users REQUIREMENT	8	11	13	16	18
Trunk type	BRI	BRI	PRI	PRI	PRI
Connected components: analogue, ISDN	1 combi-module - 4 analogue ports - 4 ISDN ports	1 combi-module - 4 analogue ports - 4 ISDN ports	1 combi-module - 4 analogue ports - 4 ISDN ports	1 combi-module - 4 analogue ports - 4 ISDN ports	1 combi-module - 4 analogue ports - 4 ISDN ports
Connected components: TDM	Not applicable	1 TDM module with 16 ports	1 TDM module with 16 ports	1 TDM module with 16 ports	1 TDM module with 16 ports
Measurement of Active Mode Active user terminals	Analogue/FAX (1) S0 ISDN (1) (2) VoIP telephone	Analogue/FAX (1) S0 ISDN (1) TDM/System te-lephone (1) on an additional TDM and a (1) VoIP/System telephone	Analogue/FAX (1) S0 ISDN (1) TDM/System te-lephone (1) on an additional TDM and a (1) VoIP/System telephone	Analogue/FAX (1) S0 ISDN (1) TDM/System te-lephone (1) on an additional TDM and a (1) VoIP/System telephone	Analogue/FAX (1) S0 ISDN (1) TDM/System te-lephone (1) on an additional TDM and a (1) VoIP/System telephone