

BLUE ANGEL

The German Ecolabel



Routers

DE-UZ 160

Basic Award Criteria

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Version 1

The Environmental Label is supported by the following four institutions:



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.

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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

Private households use a router to gain access to the Internet. The router primarily connects the local area network (LAN) to the wide area network (WAN) and thus provides the final consumer - either bundled or separately - with Internet, TV, telephony and smart home.

According to the study entitled "Entwicklung des IKT-bedingten Strombedarfs in Deutschland" (Development of the ICT-related power consumption in Germany) (BMWi 2015) there were 30.6 million routers in use in German households in 2015. Assuming that these routers are operated continuously with an average power consumption of 8.5 watts this adds up to an annual energy demand of 2.3 terawatt hours (TWh).¹ The electric energy demand of routers during their useful life is basically determined by technical and use-related parameters, as for instance, by the range of functions, the number of enabled and connected interfaces as well as frequency and intensity of use. Apart from the energy-related environmental impact during the useful life of the product environmental impacts also result from the manufacturing phase. The choice of materials and the design that is primarily determined by electrical, thermal and mechanical requirements for the device can help improve the durability, reparability and recyclability of the devices.

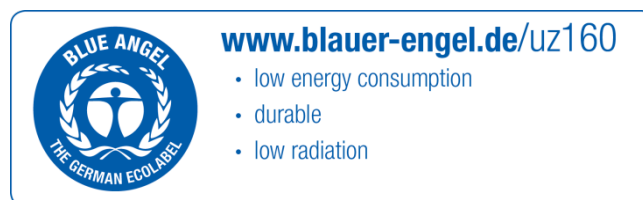
1.3 Objectives of the Blue Angel Eco-Label

The aim of the Blue Angel eco-label for routers is to signal to the buyer of such a device that the eco-labelled product meets - better than others - the goals of precautionary environmental, health and consumer protection. Hence, the Blue Angel eco-label can provide the consumer with guidance in decision-making when buying a new device. Hence, the Blue Angel eco-label may be awarded to routers that meet the following ecological criteria:

¹ Study available on the Internet (Download March 2017) at:
http://www.bmwi.de/Redaktion/DE/Downloads/E/entwicklung-des-ikt-bedingten-strombedarfs-in-deutschland-abschlussbericht.pdf?__blob=publicationFile&v=3

- **Low energy consumption during use:** This goal is achieved by selecting the latest, high-quality and adequately dimensioned electronic components as well as by a consequent, automatic and reliable power management. The functionality is to be provided in accordance with a defined availability (operating modes) with the lowest possible electric power consumption.
- **High reliability and durability:** This goal is achieved by a functionally adequate dimensioning of components, a reliable thermal and mechanical design as well as repair guarantee and software updatability.
- **Protection of resources during the entire product life cycle:** This goal is achieved by using materials with a low environmental impact (including packaging), an ecologically inspired material selection and device design.
- **Low electromagnetic radiation:** This goal is achieved by a need-based adaptation of the transmission power and the radiation characteristics of the antennas.

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



1.4 Compliance with Legal Requirements

It is a matter of course for Blue Angel eco-labelled products to comply with the provisions of German and European law. These provisions include in particular:

- The WEEE Directive (2012/19/EU)² transposed into German law by the Electrical and Electronic Equipment Act (Elektro- and Elektronikgesetz, ElektroG³), which regulates the disposal of the products (ElektroG).
- The RoHS Directive 2011/65/EU⁴ transposed into German law by the Electrical and Electronic Equipment Substances Ordinance (ElektroStoffV)⁵ which regulates the content of hazardous substances in the products.
- EU Directive 2006/66/EC⁶ transposed into German law by the Batteries Act (Batteriegelgesetz; BattG)⁷.

² Directive 2012/19/EU on Waste Electrical and Electronic Equipment (revised version); WEEE Directive

³ Act governing the Sale, Return and Environmentally Sound Disposal of Electrical and Electronic Equipment (Electrical and Electronic Equipment Act - ElektroG) of 20 October 2015 (BGBl. I p. 1739).

⁴ Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (revised version); RoHS Directive.

⁵ Ordinance on the Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment (Elektro- und Elektronikgeräte-Stoff-Verordnung); ElektroStoffV

⁶ DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL. of 6 September 2006. on batteries and accumulators and waste batteries and accumulators OJ L 339, p. 39–39, No L139, p. 40

⁷ Act on the Distribution, Take-back, and Environmentally Sound Disposal of Batteries and Accumulators (Batteriegelgesetz - BattG) of 25 June 2009 (Federal Law Gazette I, p. 1582), last amended by Article 1 of the Act of 20 November 2015 (Federal Law Gazette I, p. 2071)

- The substance requirements defined by the EU Chemicals Regulation REACH (EC/1907/2006)⁸ and the POP Regulation (EC 2016/293)⁹.
- The Radio Equipment Directive (2014/53/EU)¹⁰ (RED) transposed into German law by the German Radio Equipment Act Funkanlagengesetz (FuAG) relating to the placing of radio equipment on the market.
- Amendment to the Standby Regulation (EC 801/2013)¹¹ which from January 1, 2017 sets binding limits of 8 W for maximum power consumption in standby mode with high network availability (HiNA).

1.5 Definitions

1.5.1 Manufacturers, Distributors, Users

- **The Manufacturer** is any natural or legal person who manufactures a product or has a product designed or manufactured, and markets that product under his name or trademark.
- **The Distributor** is any natural or legal person who makes a product available for distribution or use whether in return for payment or free of charge and irrespective of the marketing method.
- **The User** of the device is the end-user who uses and/or sets the functionalities of the device. It includes administrators whereas device or service engineers of the distributor or of the company that distributes or maintains the device are not regarded as users.

1.5.2 Operating States

- **"On" state** means an operating state where the device processes a payload, i.e. it receives, processes, stores or forwards data. The definitions of the On state of individual components and network ports are explained in Broadband Equipment Code of Conduct Version 6.0, Tables 7 to 9.¹²

⁸ Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; REACH Regulation

⁹ Commission Regulation (EU) 2016/293 of 1 March 2016 amending Regulation (EC) No 850/2004 of the European Parliament and of the Council on persistent organic pollutants as regards Annex I; POP Regulation

¹⁰ Directive 2014/53/EU 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 - Text With EEA relevance; RED Directive;

¹¹ Commission Regulation (EU) No 801/2013 of 22 August 2013 amending Regulation (EC) No 1275/2008 with regard to ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment, and amending Regulation (EC) No 642/2009 with regard to ecodesign requirements for televisions

¹² JRC Technical Report (2017): EU Code of Conduct on Energy Consumption of Broadband Equipment, Version 6
http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106039/ictcoc-ecbe-v6_feb_2017_final.pdf (as of July 5, 2017)

- **"Off" state** means an operating state where the device does not provide any functionality and would have to be started to work (booting).
- **"Idle" state** means an operating state where the device does not transfer data via a network connection but can resume data transfer immediately (in less than 3 seconds). The definitions of the Idle state of individual components and network ports are explained in Broadband Equipment Code of Conduct Version 6.0, Tables 3 to 6.

1.5.3 Further Technical Terms

- **LAN** (Local Area Network), also called Ethernet, means wired networks for broadband data transmission on the basis of the IEEE 802.3 standard series.
- **Modem** means a component the main function of which is to transmit and receive digitally modulated signals via a wired network.
- **Network Port or interface** means a wired or wireless physical interface or port to the external network connection of the device.
- **Payload** means the data to be transmitted and processed by the device.
- **Transition time** means the maximum allowable time to switch from a higher operating state to a lower one.
- **WLAN** (Wireless Local Area Network) or WiFi means a radio-based network for broadband data transmission on the basis of the IEEE 802.11 standard series.
- **Central Function** means the main processor unit providing the primary routing functionality.

2 Scope

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.

These Basic Criteria shall apply to routers that:

- are used to connect private households or small businesses to the Internet;
- and can be supplied with electric power via an integrated or external power supply unit, a battery¹³ or a network connection;
- and include wired and/or radio-based network interfaces and modems.

The Basic Criteria shall not apply to modems that are externally connected to a router.

¹³ Reference to battery-operated devices shall be made as this may influence the measurement of the electric power consumption and hence must be taken into account in connection with requirements concerning the verification processes.

3 Requirements

3.1 Energy Efficiency

3.1.1 Electric Power Consumption

1.) Limits

The router must not exceed the electric power consumption limits set out in the Broadband Equipment Code of Conduct Version 6 for Tier 2018 both in "Idle" and "On" state under the measurement conditions defined for each state. In the event that the Code of Conduct is revised the latest version and the Tier of the year during which the application is filed shall apply.

The applicant shall confirm compliance with these limits for the individual device configuration (each network port) and submit appropriate measurement reports upon filing the application.

2.) Example Scenarios

Besides, the applicant shall report the average electric power consumption both in On and Idle state for three example application scenarios in the product documentation:

- a) LAN+telephony scenario
- b) WLAN+telephony scenario
- c) Telephony scenario

Power consumption shall be measured in accordance with Appendix A "Requirements for Measuring Electric Power Consumption" always using the standard power supply supplied with the device.

The average power consumption both in On and Idle state shall be reported in the product documentation for the example LAN and WLAN application scenarios.

Compliance Verification

The applicant shall present in Annex 7 the test protocol of the measurements performed for a minimum of three devices tested in accordance with Appendix A: "Requirements for Measuring Electric Power Consumption". Also, the applicant shall specify in Annex 1 to the Contract the average power consumption, highlight the corresponding passages in the product documents that document this power consumption and present the relevant pages of the product documentation in Annex 2 to the Contract. The test report must be prepared by a testing laboratory that meets the general requirements for competence of testing and calibration laboratories under DIN EN ISO/IEC 17025. Test reports prepared by the applicant will be accepted as equivalent if the latter uses a testing laboratory that has been accredited for these measurements by an independent body as SMT (Supervised Manufacturer's Testing) laboratory.

3.1.2 Defined Transition Time

The router must feature automatic fallback to Idle state that sets the device to Idle within a transition period of no more than 5 minutes after processing a payload in On mode.

The transition time shall be measured in accordance with Appendix A: "Requirements for Measuring Electric Power Consumption and Transition Time".

Compliance Verification

The applicant shall declare compliance with this requirement in Annex 1 to the Contract and submit in Annex 7 the test protocol of the measurements performed for a minimum of three devices tested in accordance with Appendix A: "Requirements for Measuring Electric Power Consumption and Transition Time". The test protocol shall distinctly highlight the time "when active data transmission ends" and the time "when Idle state is reached" at a largely stable power consumption within 5 minutes.

3.1.3 Power Management

The router must be designed so as to allow the user to individually enable or disable non-required functions or select individual energy saving settings using a software function or a switch.

Moreover, the router's electric power consumption in On state must adapt itself in dependence of both function and load. The router must feature automatic power management that minimizes the electric power consumption at all times in a timely and functionally appropriate manner.

WLAN

The router must be designed so as to allow the user to manually disable the WLAN module by using a switch on the housing. The device shall allow the user to program the device to enable and disable the WLAN radio module according to a time schedule.

The router must reduce the WLAN transmission power of the WLAN module when there is no terminal device registered. Moreover, in order to limit radiation exposure the user must be allowed to adjust the transmission power of the device.

The current WAN and WLAN status must be displayed on the device as well as on the user interface.

Other Functions

The router must be designed so as to allow the deactivation of a possibly existing DECT function. DECT shall be disabled on delivery.

The electric power consumption of unused LAN ports, i.e. ports with no cable connected as well as ports with a non-active device connected shall be minimized automatically.

If the router comes with mobile communications interface (e.g. LTE) the activated device must have a signal strength indicator that provides information on the quality of the connection to the mobile communications network that would help the user find the most suitable location for the device in terms of radio technology.

Settings on the Router Menu

When accessing the configuration menu users must be informed that they can have decisive influence on the energy consumption of their device by adjusting the settings e.g. (timer function, transmission power reduction, individual deactivation). The menu shall provide the user with clear and easily understandable information on the possibility to individually disable

certain functionalities (especially DECT and WLAN) and, thereby, reduce electric power consumption.

Information Provided in the Product Documentation

The product documentation shall inform the user that disabling unused interfaces helps reduce the power consumption of the device and provide details of how to disable individual functionalities. Also, the product documentation shall provide information and explanation on how to activate the timer function and reduce the transmission power of the WLAN module in order to reduce energy consumption and radiation exposure.

Compliance Verification

The applicant shall declare compliance with this requirement in Annex 1 to the Contract, highlight the relevant passages in the product documentation that make reference to the functions and present the relevant pages of the product documentation in Annex 2 to the Contract. In addition, the applicant shall present (in Annex 3) screenshots showing the software function in the menu upon first use of the device.

3.1.4 Integrated DECT Stations

If the router comes with integrated DECT stations these stations must meet the additional requirements for base stations as set forth in DE-UZ 131 (Digital Cordless Phones), Edition of April 2014, paras. 3.2 and 3.3, unless explicitly stipulated in the present Basic Criteria.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract. If the routers come with integrated DECT stations the applicant shall present - as Annex 9 - the compliance verifications required under paras. 3.2 and 3.3 of the DE-UZ 131 Basic Criteria.

3.2 Durability, Repair and Reuse

3.2.1 Warranty

In order to meet the expectations of high product quality and long durability the applicant undertakes to offer a two-year warranty on the product, at no extra cost.

The product documents shall include warranty details.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract, highlight the relevant passages in the product documentation that make reference to the warranties offered and present the relevant pages of the product documentation in Annex 2 to the Contract.

3.2.2 Software Updates

The applicant undertakes to make functional and, above all, security-related software updates for at least four years from the time that production ceases. The device shall come with a free function to allow the user to update the operating system. The aim of these updates is, above

all, the closing of known security holes. The product documents shall provide information on how to implement software updates.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract, highlight the relevant passages in the product documentation that make reference to the software updates and present the relevant pages of the product documentation in Annex 2 to the Contract.

3.2.3 Repair and Spare Parts Availability

The applicant undertakes to perform repairs or provide infrastructures for repair services for at least four years from the time that production ceases and to make sure that the availability of spare parts for device repair is guaranteed for at least four years from the time that production ceases. Spare parts shall be offered at reasonable prices by the manufacturer itself or by a third party.

Spare parts are those parts which, typically, may fail or break down within the scope of the ordinary use of a product, as for example power supplies or rechargeable batteries (if any).

The routers shall be designed so as to enable qualified specialist workshops to repair or replace such spare parts with reasonable effort.

The product documents shall provide information on the assembly of components, spare parts supply and repair services.

The device shall meet the requirements under para. 3.3.2 not only for a design optimised for recycling but also for one that is optimised for repair.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract, highlight the relevant passages in the product documentation that make reference to spare parts supply and repair and present the relevant pages of the product documentation in Annex 2 to the Contract.

3.2.4 Replaceability of Rechargeable Batteries

If the device contains rechargeable batteries, these batteries shall be replaceable by the user without the need for any special tools and without the risk of damage. Rechargeable batteries are typical spare parts and are subject to the requirement of para. 3.2.3.

Moreover, the rechargeable batteries must meet the current requirements of DIN EN IEC 62133 and DIN EN IEC 61951-2[1]. The product documents shall provide information on how to replace the batteries and on the type of batteries used as well as on the proper disposal of batteries.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract, highlight the relevant passages in the product documentation that describe the replacement of the rechargeable battery and the type of battery used and present the relevant pages of the product documentation in Annex 2 to the Contract.

3.2.5 Replaceability of Hard Disk Drives and Mass Storage Devices

It shall be possible for the user to remove hard disk drives (HDD) and other mass storage modules (SSD, etc.) without the need for any special tools and without the risk of damage. Preference should be given to a direct access from the outside (slide-in) without the need to open the device.

Visual instructions on how to remove the mass storage device shall be made available to the user in the information materials or in an online video.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract, highlight the relevant passages in the product documentation and present the relevant pages of the product documentation in Annex 2 to the Contract or give the link to the online video in Annex 1, respectively.

3.2.6 Data Deletion

To allow reuse of the device it shall be designed so as to enable the user to completely and securely delete all personal data without the help of pay software. This can be accomplished by either physically removing the memory card or with the help of free manufacturer-provided software. As an alternative to removing the data, it shall also be possible to encode the personal data on the data medium by means of software provided, thus ensuring secure deletion of the key.

In addition, the device shall provide a software function that resets the device to its factory settings.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract, highlight the relevant passages in the product documentation that make reference to data deletion and the function to reset the device to its factory settings and present the relevant pages of the product documentation in Annex 2 to the Contract.

3.2.7 Take Back

The applicant undertakes to take back eco-labelled and own-manufactured products after use in order to channel them with preference to reuse or to material recycling in accordance with the German Elektro- and Elektronikgesetz (Electrical and Electronic Equipment Act - ElektroG). Non-recyclable device parts shall be disposed of in an environmentally sound manner. The devices shall be taken back free of charge - either personally or by shipment - at applicant's facility or at a return facility named by the applicant. The product documentation of the device shall provide detailed information on the return options.

Compliance Verification

The applicant shall declare compliance with the requirement in Annex 1 to the Contract, highlight the relevant passages in the product documentation that make reference to product take back and present the relevant pages of the product documentation in Annex 2 to the Contract.

3.3 Recycling

3.3.1 Recycling Strategy

The router shall be designed so as to allow a low-effort separation of significant material fractions, such as plastics, ferrous metal, copper and aluminium. A minimum of 90 percent of the mass of plastics and metals of housing parts/chassis must be recyclable by material (this does not mean the recovery of thermal energy by incineration).

Compliance Verification

The applicant shall declare compliance with the requirement, give the link providing electronic access to the recycling strategy in Annex 1 and present the published recycling strategy in Annex 6.

3.3.2 Design Optimised for Recycling

The router shall be designed so as to allow specialist companies to dismantle the device into its main parts by the use of commonly available tools for the purpose of recycling. This particularly applies to the following components:

- Housings with plugs/connectors
- Printed circuit board assemblies (mainboard)
- Rechargeable battery
- Large-area heat-sinks and heatpipes
- Mass storage devices

For this purpose, components made of mutually incompatible materials must be separable or connected by separation aids. Electronic subassemblies must be easy to find and easy to remove. Separable connections must be easy to find.

For a design optimised for repair and recycling this means in concrete terms:

- a) The use of simple mechanical mountings, clamp and spring mechanisms should always be given preference over screwed or glued connections, provided that this is consistent with the requirements for reliability and robustness. A visual highlighting of these connections, for example by colour coding, can make disassembly faster.
- b) The use of double-faced adhesive tape shall be permitted if the adhesive tape can be easily identified, grasped and removed by means of pull straps without leaving any residue.
- c) The use of thermally or electrically conductive adhesive connections in the electronic packaging of integrated circuits shall be permitted. However, the attaching of metal sheets on large areas of the housing plastics (e.g. for the purpose of heat dissipation) shall not be permitted.
- d) Glued connections must not be used to attach connectors or plug-in connectors and LEDs to the housing.
- e) The use of screws shall be permitted if type and number are limited to a minimum. Only common type screws shall be permitted for use in the device. It must be possible to loosen these screws without the need for special tools.

- f) The number of screws used to fasten main components such as housing, printed circuit board(s) and heatsinks should not exceed six each (exceptions must be technically justified).
- g) Screws should be placed so as to make sure they are not hidden and allow their easy loosening using a commonly available tool. A visual highlighting of the screws, for example by surrounding colour codings, can make disassembly faster, provided that the colour does not conflict with other codings (components).

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1, highlight the relevant passages of the recycling strategy that provide evidence of the possibility to disassemble the router for the purpose of recycling and present the recycling strategy in Annex 6 to the Contract. The explanatory statement requesting a technical exception from requirement No. 6 shall also be presented in Annex 6.

3.3.3 Material Selection

The following shall apply to plastic parts (except for cables) with a mass greater than 25 grams as well as to key caps, provided that their total mass exceeds 25 grams:

- ABS, HIPS and PP are the only types of plastic that may be used for these parts.
- The plastic housings must be recyclable by material.

Plastic parts with a mass greater than 25 grams each and an even surface area of more than 200 sq.mm. must be permanently marked in accordance with ISO 11469 with due regard to ISO 1043, Parts 1 to 4. Transparent plastic parts the function of which requires transparency (e.g. visible plastic films in displays) shall be exempt from marking according to ISO 11469. Galvanic coatings and other metallic coatings of plastic housing parts shall not be permitted.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract, specify the plastics used for plastic parts greater than > 25 grams in mass as well as the respective percentage of recycled plastics related to the mass of the plastic part in Annex P-L 25 to the Contract. Besides, the applicant shall highlight the relevant passages of the recycling strategy that provide evidence of the recyclability by material type and present the recycling strategy in Annex 6 to the Contract.

3.3.4 Material Requirements for Plastics and Plastic Housing Parts

The plastics used in housings and housing parts must not contain, as constituent components, any substances with the following characteristics:

1. Substances that have been identified as substances of very high concern under Regulation (EC) No 1906/2006 (REACH)⁸ and have been included in the list (so-called Candidate List) set up in accordance with REACH, Article 59(1).

2. Substances that have been classified under the CLP Regulation into the following hazard categories or meet the criteria for such classification:
- ♦ carcinogenic of category Carc. 1A or Carc. 1B
 - ♦ mutagenic of category Muta. 1A or Muta. 1B
 - ♦ reprotoxic of category Repr. 1A or Repr. 1B

Halogenated polymers shall not be permitted in housings and housing parts. Nor may halogenated organic compounds be added as flame retardants. Nor shall any flame retardants be permitted which are classified under the CLP Regulation as carcinogenic of Category Carc. 2 or as hazardous to waters of Category Aquatic Chronic 1.

The hazard statements (H phrases) assigned to the hazard categories can be seen from Appendix B: Assignment of Hazard Categories and Hazard Statements.

The following shall be exempt from this requirement:

- fluoroorganic additives (as, for example, anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed 0.5 weight percent;
- plastic parts weighing 25 grams or less

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and submit a written declaration from the plastic manufacturers or ensure the submission of such declaration to RAL gGmbH. Such declaration shall confirm that the banned substances have not been added to the plastics and give the chemical designation of the flame retardants used, including CAS No. and classifications (H statements) (Annex P-M to the Contract). When first applying for the Blue Angel eco-label the declaration submitted must not be older than 6 months. If one applicant files additional applications for the eco-labelling of products containing the same plastics the declarations submitted may be presented unchanged during the term of the Basic Criteria. Notwithstanding this, RAL shall be entitled to ask for an updated version of the declarations if the Umweltbundesamt (Federal Environment Agency) finds that product-relevant substances have been added to the Candidate List.

3.4 Electromagnetic Radiation

Devices to be Blue Angel eco-labelled with one or more wireless interfaces and a total transmission power of 10 mW or more shall be designed so as to make sure that the specific absorption rate (SAR) caused in exposed persons by the emitted high-frequency electromagnetic radiation does not exceed 0.60 watts per kg locally averaged over 10 grams of tissue mass. The maximum SAR value shall be determined in accordance with DIN EN 62209-2 and the position of the test sample relative to the body phantom used for measurement purposes ("measurement phantom") shall be chosen in accordance with paras. 6.1.4.7 „Desktop devices“ and, if applicable, 6.1.4.5 „Device with hinged or swivel antenna(s)“. The assessment shall be based on the maximum value resulting when there is with no distance between device and body phantom.

Compliance Verification

The applicant shall declare compliance with the requirement in Annex 1 and present - in Annex 8 - a measurement protocol according to DIN EN 62209-2 verifying compliance with the requirement. Testing laboratories charged with performing these measurements shall be affiliated with a body notified according to the German law on the placing of radio equipment on the market (Radio Equipment Act - Funkanlagengesetz - FuAG)).

3.5 User Information

The router shall come with a short guide and operating instructions. The short guide shall be enclosed with the device on paper. Printed product literature enclosed with the product should be printed on recycled paper, if possible on Blue Angel eco-labelled paper. The Short Guide shall at least include the following information - presented in a well-organized and easy-to-read form:

- Instructions for analogously displaying the status of the operating states of the router or individual interfaces on the device (e.g. LED displays).
- Instructions for digitally displaying the status of the operating states of the router or individual interfaces on the user interface.
- Instructions on how to enable or disable radio modules (such as, among others, WLAN, DECT).
- Instructions on how to activate the timer function and the transmission power reduction of the WLAN module in order to reduce energy consumption and radiation exposure.
- Information on electric power consumption (in watts) when in On and in Idle for three example application scenarios.
- Instructions for energy efficient use of the router, including instructions for automatic and manual power management as well as for an optimal positioning of the router in a room.
- Instructions for battery removal (if any).
- Instructions for mass storage module removal (if any).

Operating Instructions and Short Guide of a router equipped with one or more radio transmitters shall additionally inform the user:

- that the device – due to operating conditions - emits high-frequency electromagnetic fields,
- that exposure to these fields can be reduced by way of precaution if the device is installed in a central place where people usually do not spend much time, i.e. for example, in the hall,
- that the WLAN transmitter can be permanently turned off using a switch on the housing and can be programmed to be turned off using the timer function,
- that the display showing the quality of the wireless connection on the device (e.g. for UMTS/LTE) can help find a technically optimal location for the router.

Compliance Verification

The applicant shall declare compliance with the requirement in Annex 1 and present the relevant pages of Short Guide (Annex 4) and Operating Instructions (Annex 5).

4 Applicants and Parties Involved

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

Parties involved in the award process are:

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

5 Use of the Blue Angel Eco-Label

The terms governing the use of the Environmental Label by the applicant are stipulated in a Contract on the Use of the Environmental Label to be concluded with RAL gGmbH.

Within the scope of such contract the applicant undertakes to comply with the requirements under para. 3 for as long as the environmental label is used.

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 eco-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 eco-label to the product entitled to the label if it is to be marketed under another brand/trade name and/or other marketing organizations.

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

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

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Appendix A Requirements for Measuring Electric Power Consumption and Transition Time

General Test Conditions:

The basic test conditions for measuring the average electric power consumption in "Idle" mode such as the calibration of test equipment and test environment comply with IEC 62301 "Household Electrical Appliances – Measurement of Standby Power", Section 4, "General Conditions for Measurements".

Wiring of the LAN Scenario:

The WAN port is wired by a broadband connection and connected to the Internet (both for hybrid landline and mobile communications accesses). 2x gigabyte LAN ports are wired and connected to computer terminals (notebook PCs) via a 10 m LAN cable each. A telephone is connected to the FXS port. All other functions can be disabled.

The measuring instrument is placed between socket and power supply.

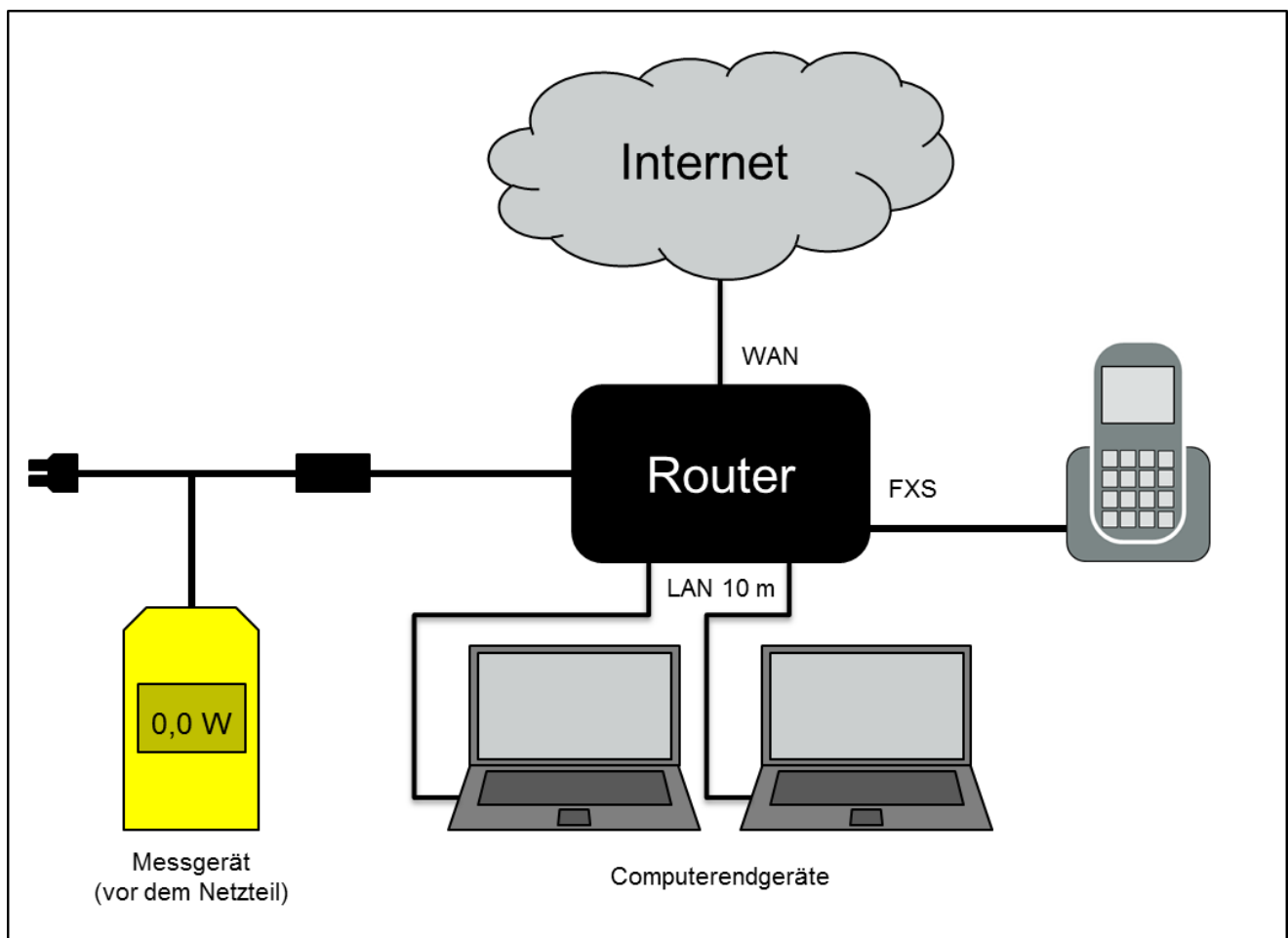


Fig. 1: Measurement setup of the LAN scenario

Wiring of the WLAN Scenario:

The WAN port is wired by a broadband connection and connected to the Internet (both for hybrid landline and mobile communications accesses). All WLAN modules are enabled and connected to two computer terminals (notebook PCs) at a distance of at least 5 meters. A telephone is connected to the FXS port. All other functions can be disabled. The measuring instrument is placed between socket and power supply.

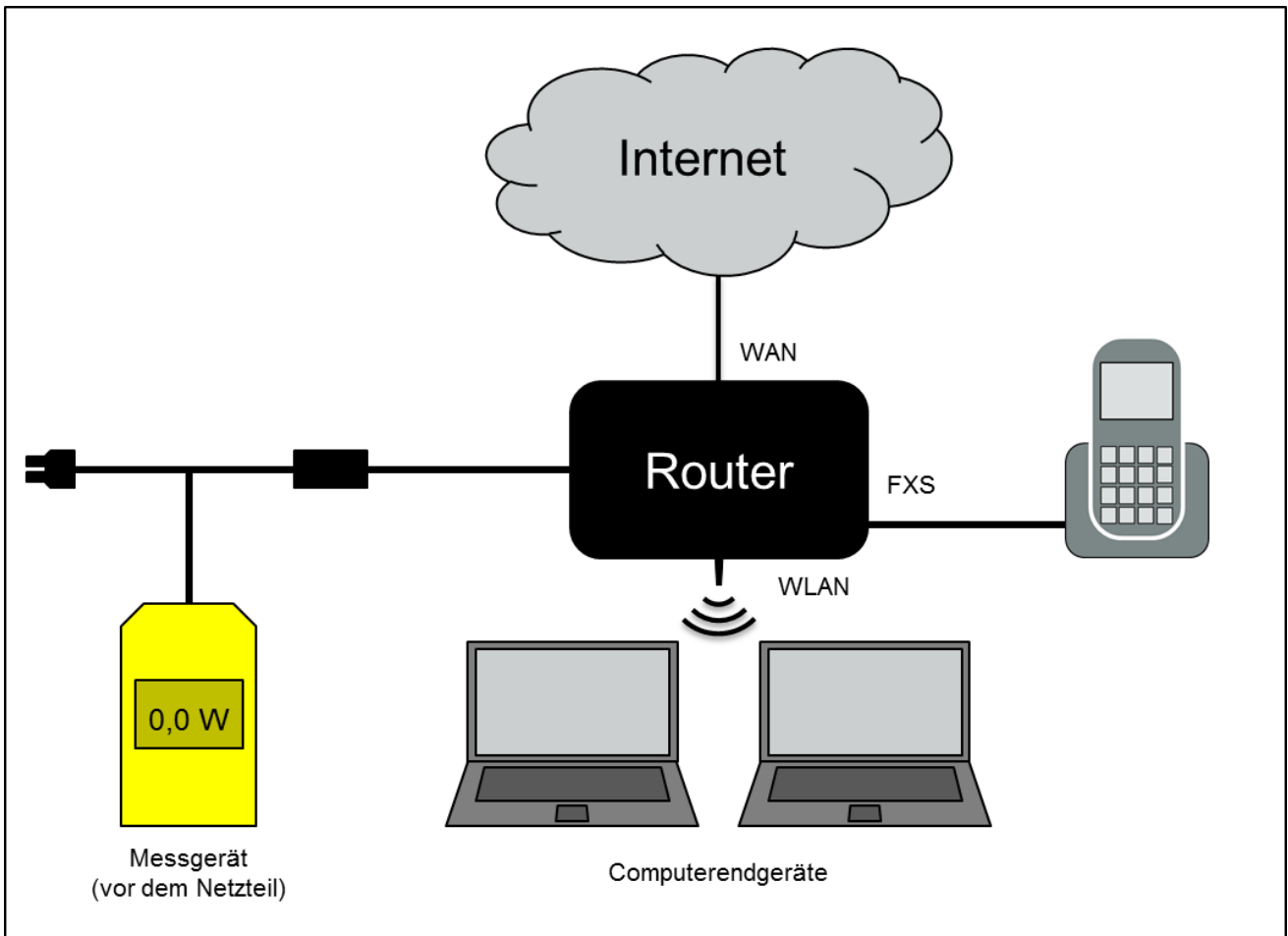


Fig. 2: Measurement setup of the WLAN scenario

Wiring of the Telephone Scenario:

The WAN port is wired by a broadband connection and connected to the Internet (both for hybrid landline and mobile communications accesses). LAN and WLAN are available. A telephone is connected to the FXS port. All other functions can be disabled. The measuring instrument is placed between socket and power supply.

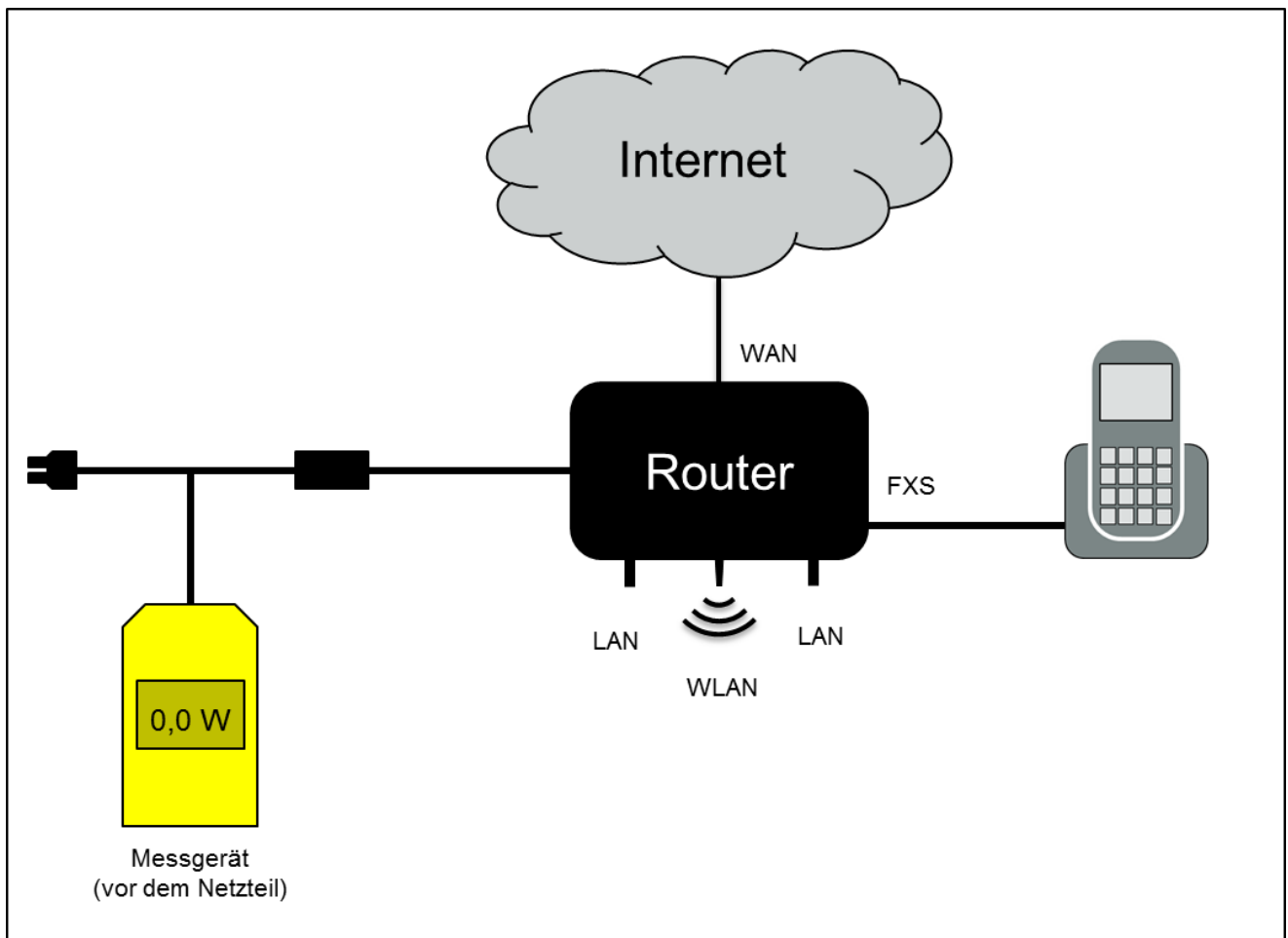


Fig. 3: Measurement setup for the telephone scenario

Execution of the Measurement (LAN and WLAN Scenario):

Each computer terminal shall request a full HD video stream from a media server (such as Youtube). Measurement of the router's electric power consumption shall begin with setting up the connection to the server (click on the video stream) and end after 10 minutes. The average electric power consumption over the measurement period shall then be determined as measurement value for the "On" state and documented in watts rounded to one decimal place.

After that, the active network adapters (LAN or WLAN) shall be disabled at both computer terminals. After a transition time of 5 minutes to reach a stable "Idle" state the measurement of the "Idle" state shall begin and run for 10 another minutes. The applicant shall document compliance with the 5-minute transition time. Following this, the applicant shall determine the average electric power consumption during the period of measurement as "Idle state" and document the value in watts rounded to one decimal place.

Execution of the Measurement (Telephone Scenario):

An active telephone connection shall be set up from the telephone connected. Measurement of the router's electric power consumption shall begin with setting up a stationary connection and end after 10 minutes. The average electric power consumption over the measurement period shall then be determined as measurement value for the "On" state and documented in watts rounded to one decimal place.

After that, the telephone connection shall be disconnected (hang up). After a transition time of 5 minutes to reach a stable "Idle" state the measurement of the "Idle" state shall begin and run for another 10 minutes. The applicant shall document compliance with the 5-minute transition time. Following this, the applicant shall determine the average electric power consumption during the period of measurement as "Idle" state and document the value in watts rounded to one decimal place.

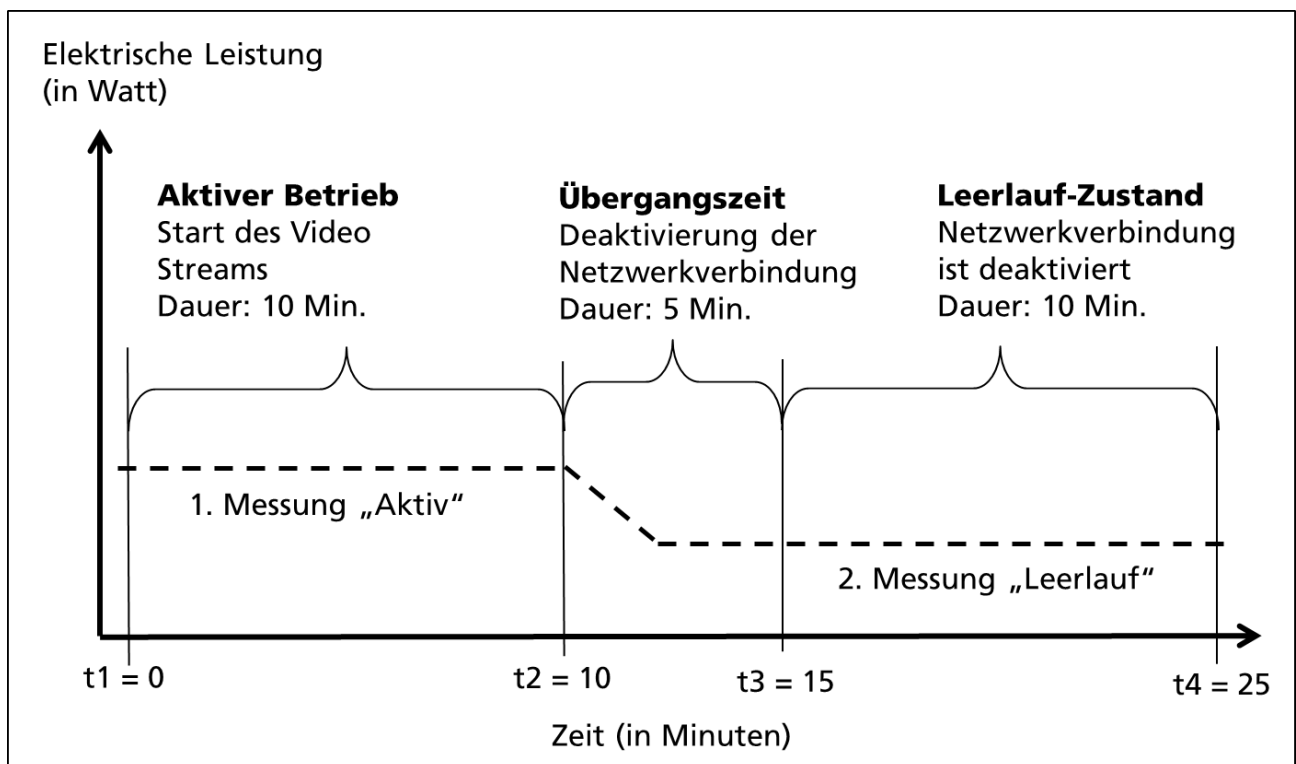


Fig. 4: Execution of measurement, in principle

Appendix B Assignment of Hazard Categories and Hazard Statements

The following table assigns the respective hazard statements (H statements) to the hazard categories of the substances generally excluded.

CLP Regulation (EC) Nr. 1272/2008

Hazard Category	Hazard Code	Hazard Statement (Wording)
Carcinogenic Substances		
Carc. 1A Carc. 1B	H350	May cause cancer.
Carc. 1A Carc. 1B	H350i	May cause cancer by inhalation.
Carc. 2	H351	Suspected of causing cancer.
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.
Environmentally Hazardous Substances		
Aquatic Chronic 1	H410	Very toxic to aquatic life with long lasting effects.