Criteria for the award of Green Product Mark

Consumer – Router

Contents

Foreword 3
Introduction 4
1 Scope 5
2 Normative References 6
3 Terms and Definitions 7
3.1 Green Product Mark 7
3.2 Router 7
3.3 Customer Premises Equipment 7
3.4 Pre-requisites 7
3.5 Product environmental criteria 7
3.6 Product function characteristics 7
4 Prerequisites 8
4.1 Social compliance 8
4.2 Product Safety 8
5 Product environmental criteria 9
5.1 Restriction of hazardous substances 9
5.2 Electromagnetic Radiation (Health) 13
5.3 Sustainable use of resources 13
5.3.1 Energy Efficiency 13
5.3.1.1 Power Consumption 13
5.3.1.2 Defined Transition Time 14
5.3.1.3 Power Management Requirements 14
5.3.2 Recycle Design 15
5.3.2.1 WEEE 15
5.3.2.2 Recycled(post-consumer) Material Content 16
5.3.2.3 Recycling Strategy 16
5.3.2.4 Design Optimised for Recycling 17
5.3.2.5 Material Selection 18
5.3.2.6 Take Back 18
5.4 Product Climate Resilience 19
6 Product function characteristics 20
6.1 Durability, Repair and Reuse 20
6.2 Longevity 21
6.3 User Guide Information 21

Foreword

The work of selecting and developing criteria for the award of Green Product Mark is carried out through Global 2PfG-E Technical Committees (PTC) convened by TÜV Rheinland. Interested parties participate in the selection and development of criteria for the award of Green Product Mark through either PTC membership or stakeholder consultation mechanism.

Criteria for the award of Green Product Mark are drafted in accordance with the rules given in following standards and guides:

- ISO/IEC Directives, Part 1 and Part 2
- ISO/IEC Guide 21, Part 1 and Part 2
- ISO Guide 64
- ISO Guide 82
- ISO 14024
- US EPA Guidelines for Environmental Performance Standards and Ecolabels for Use in Federal Procurement
- ISEAL Code of Good Practice for Setting Social and Environmental Standards

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. TÜV Rheinland shall not be held responsible for identifying any or all such patent rights.

This document was developed using a multi-stakeholder approach involving experts from multiple stakeholder groups including but not limited to consumers, government, industry, labour, non-governmental organizations (NGOs), and service, support, research, academics. Although efforts were made to ensure balanced participation of all the stakeholder groups, a full and equitable balance of stakeholders was constrained by various factors, including the availability of resources and the need for English language skills.

Introduction

Product environmental labels are claims which indicate the environmental aspects of a product and provide information about a product in terms of its overall environmental character, a specified environmental aspect, or any number of aspects. Green Product Mark is a voluntary environmental labelling scheme operating in accordance with ISO 14020 *Environmental labels and declarations – General principles* and ISO 14024 *Environmental labels and declarations – Type I environmental labelling – Principles and procedures*. Green Product Mark has been developed in accordance with ISO/IEC 17067 *Conformity assessment – Fundamentals of product certification and guidelines for product certification schemes*. Certification activities under Green Product Mark scheme shall be performed in accordance with ISO/IEC 17065 *Conformity assessment – Requirements for bodies certifying products, processes and services*.

Through the communication of verifiable and accurate information on environmental aspects of products, Green Product Mark aims to encourage the demand for and supply of those products that cause less stress on the environment, thereby stimulating the potential for market-driven continuous environmental improvement.

Green Product Mark certification scheme is owned by TÜV Rheinland, a leading international technical service provider who have been developing solutions to ensure the safety, quality and economic efficiency of the interaction between man, technology and the environment.

This document is intended to convey clear and unambiguous requirements to be fulfilled for products to get awarded with Green Product Mark.

1 Scope

This document lays out prerequisites, product environmental criteria and product function characteristics that router shall comply with, in order to get awarded with Green Product Mark. This document covers also the router for Small Office Home Office (SOHO) applications and the Customer Premises Equipment (CPE). This document does not cover set-top boxes.

All products which demonstrate compliance with relevant prerequisites, product environmental criteria and product function characteristics set forth in this document are entitled to be awarded Green Product Mark.

2 Normative References

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- SA 8000 Social Accountability
- Responsible Business Alliance (RBA)
- amfori Business Social Compliance Initiative
- SMETA Audit
- ISO 14001 Environmental Management Systems-Requirements with Guidance for use
- ISO 14040, Environmental management -- Life cycle assessment – Principles and framework
- ISO 14044, Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 14067, Carbon footprint of products – Requirements and guidelines for quantification and communication
- ISO 14021, Environmental labels and declarations–Self-declared environmental claims (Type II environmental labelling)
- Product Environmental Footprint (PEF) Guide
- Low Voltage Directive 2014/35/EU
- Radio equipment Directive 2014/53/EU
- Directive 2011/65/EC (RoHS Directive)
- Regulation (EU) No 1907/2006 (REACH Regulation)
- Regulation (EU) No 2019/1021 on persistent organic pollutants (POP Regulation)
- Regulation (EC) No 519/2012 (POPs)
- 15 PAH according to AfPS GS 2019:01 PAK
- IEC 61249-2-21 and IPC-4101B
- With reference to proposed EU and US ban on the use of PFAS
- DIN EN 1483
- DIN EN ISO 11885
- Packaging and packaging waste Directive 94/62/EC
- MOSH and MOAH
- French Arrêté du 13 avril 2022
- Battery Regulation (EU) 2023/1542
- ISO 11469, Generic identification and marking of plastics products
- Directive 2002/96/EC and 2012/19/EU (WEEE Directive)
- Code of Conduct on Energy Consumption of Broadband Equipment(published by Joint Research Centre)
- DE-UZ 160
- ITU-T L.1410

3 Terms and Definitions

For the purpose of this document, the following terms and definitions apply.

3.1 Green Product Mark

A voluntary environmental labelling program owned by TÜV Rheinland to indicate the overall environmental preferability of a product within a particular product category based on life cycle considerations and contribute to a reduction in the environmental impacts associated with products.

3.2 Router

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.

3.3 Customer Premises Equipment

Customer Premises Equipment (CPE) is the equipment for broadband services on the customer side that enable the user to access and utilize broadband services provided by a service provider. CPE includes a wide range of equipment such as modems, routers, home gateways, Wi-Fi access points including repeaters, Wi-Fi Extender, VoIP phones, Layer 2 switches, and other devices that facilitate communication and connectivity.

3.4 Pre-requisites

Preconditions that a product shall comply with to be awarded Green Product Mark, which in principle consist of two pillars: legislative/regulatory requirements that the product shall meet in order to access target market; social compliance requirements prescribed to the site where the product has been manufactured.

3.5 Product environmental criteria

Environmental requirements that the products shall meet in order to be awarded an environmental label. [SOURCE: ISO 14024: 2018, definition 3.4]

3.6 Product function characteristics

Attribute or characteristic in the performance and use of a product. [SOURCE: ISO 14024: 2018, definition 3.5]

4 Prerequisites

4.1 Social compliance

The social compliance of brand owner, manufacturer and production site shall be maintained with all statutory and regulatory requirements for the jurisdiction in which the manufacturing operations are located.

Methodology for assessing and demonstrating compliance:

The brand owner, manufacturer and the factory/third-party producer must submit audit reports and corrective action plans(CAPs).

Independent audits must be conducted by organizations accredited to ISO 17021 and carried out by SA8000, RBA or BSCI certified lead auditors.

Types of accepted audits are:

a. SA8000,

b. RBA VAP,

c. amfori BSCI,

d. SMETA, or

e. Report developed according to/reference to the GRI Sustainability Reporting Guidelines or GRI Sustainability Reporting Standards.

The documented proof/report mentioned in any of the above 5 options shall be a maximum of 12 months old at the time of application for Green Product Mark certification.

4.2 Product Safety

Compliance shall be maintained with safety requirements (generally accepted rules of engineering), essential usability requirements, and other requirements set forth in statutory regulations for the jurisdiction in which Green Product Mark certified products will be sold.

Methodology for assessing and demonstrating compliance:

The applicant shall provide the certificate of national safety approval relevant to the jurisdiction in which Green Product Mark certified products will be sold. The certificate shall not be older than 1 year.

5 Product environmental criteria

5.1 Restriction of hazardous substances

Chemical substances contained in the product shall comply with the limit values listed as follows:

Requirement	Regulation	Limit
Odour	In house-method,concerning SNV 195651 Rating scale 1~5 (TÜV Rheinland expertise)	Grade 2 (in operation)
RoHS	Directive 2011/65/EU and amendments	The product shall meet the substance restriction requirements of the European RoHS Directive, using the version which is in force at the time the product is declared to conform to this standard. All exemptions to the substances restrictions as defined by the Directive are applicable. Also, a RoHS Declaration of Conformity to Directive 2011/65/EC shall be provided by the applicant.
Substances of Very High Concern(REACH SVHC)	Regulation (EU) No 1907/2006	Refers to 0.1% in each article and each packaging material.
Phthalates: DEHP, DBP, BBP, DINP, DIDP, DNOP + SVHC Phthalates	With reference to Regulation (EC) No 1907/2006 Annex XIV, Annex XVII and Directive 2011/65/EU	Refers to 0.1% of each finished material of the article Plastics used in housings and housing parts shall not contain SVHC as constituent components.
Alkylphenols and Alkylphenolethoxylates	With reference to Regulation (EU) No 1907/2006	100 mg/kg each (NP/OP) / 100 mg/kg each(NPEO/OPEO)
Organotin Compounds	With reference to Regulation (EU) No 1907/2006	0.1%: MBT, DBT, DOT, TBT for skin contact materials
Pentachlorophenol (PCP)	Regulation (EU) No 2019/1021 on persistent organic pollutants (POP) Annex I	Pentachlorophenol shall not be used in any part
Flame retardants (PBBs, PBDEs, TRIS, TEPA, Arsenic trioxide)	With reference to Regulation (EU) No 1907/2006	1000 mg/kg (All materials except metals, glass, ceramic and wood)
Cadmium	Regulation (EU) No 1907/2006	100 mg/kg(materials not covered by RoHS)
Lead	Regulation (EU) No 1907/2006	90 mg/kg (accessible materials not covered by RoHS)

Requirement	Regulation	Limit
Perfluorinated carboxylic acids (C9-C14 PFCAs) and related substances	Regulation (EU) No 1907/2006	The concentration in the substance, the mixture, or the article is below 25 ppb for the sum of C9-C14 PFCAs and their salts or 260 ppb for the sum of C9-C14 PFCA-related substances. (for All plastic shell, Fluororubber, Cable, PCB board, Water and oil resistant materials shall meet requirements)
Undecafluorohexanoic acid (PFHxA), its salts and related substances	Regulation (EU) No 1907/2006	PFHxA or any of its salts equal to or below 0.025 mg/kg, the sum of concentrations of all PFHxA-related compounds equal to or below 1 mg/kg (for All plastic shell, Fluororubber, Cable, PCB board, water and oil resistant materials shall meet requirements)
Nickel release	Regulation (EU) No 1907/2006	<0.5 µg/cm²/week Conducted on metallic parts intend to come into direct and prolonged contact with skin
PAH (Polycyclic Aromatic Hydrocarbons)	15 PAH according to AfPS GS 2019:01 PAK	Requirements set by AfPS
Short chain Chlorinated Paraffins C10-C13 (SCCP)	Regulation (EU) No 2019/1021 on persistent organic pollutants (POP) Annex I	Refers to 0.1 % in each finished material of the article and each packaging (made of PVC, soft plastic and leather material)
Hexabromocycl ododecane (HBCDD)	Regulation (EC) No 519/2012(POPs)	Refers to 75 mg/kg of each finished material of the article and each packaging (made of EPS and PS foams)
Perfluoro-octanoic acid (PFOA) and Perfluorooctane Sulfonate (PFOS)	Regulation (EU) No 2019/1021 on persistent organic pollutants (POP) Annex I	< 1 µg/m2 for Textiles or other coated materials < 1000 mg/kg for Semi-finished products or articles, or the part thereof (for All plastic shell, Fluororubber, Cable, PCB board, water and oil resistant materials shall meet requirements)
Perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds PFHxS	Regulation (EC) No 519/2012 (POPs)	PFHxS or any of its salts equal to or below 0.025 mg/kg, the sum of concentrations of all PFHxS-related compounds equal to or below 1 mg/kg (for All plastic shell, Fluororubber, Cable, PCB board, water and oil resistant materials shall meet requirements)

Requirement	Regulation	Limit
Halogen	IEC 61249-2-21 and IPC-4101B	Cl, Br: 1000 mg/kg (in each material) All Printed circuit board (PCB) and substrate laminates shall meet Br and Cl requirements for low halogen as defined in IEC 61249-2-21 and IPC-4101B per 1a (refer to IEC and IPC standards for actual requirements). The maximum total halogens contained in the plastic parts exceeding 25 g, resin plus reinforcement matrix should be less than 1500 ppm with maximum chlorine of 900 ppm and maximum bromine being 900 ppm. For plastic parts exceeding 25 g manufacturer shall provide a declaration which declares the materials used in the production meet the above seen requirement
Per- and polyfluoroalkyl substances (PFAS)	With reference to proposed EU and US ban on the use of PFAS	All plastic shell, Fluororubber, Cable, PCB board, Water and oil resistant materials shall meet requirements for PFAS. All certified products shall meet the requirement. 1, 25 ppb for any PFAS as measured with targeted PFAS analysis (polymeric PFASs excluded from quantification) 2, 250 ppb for the sum of PFASs measured as sum of targeted PFAS analysis, optionally with prior degradation of precursors (polymeric PFASs excluded from quantification) 3, 50 ppm for PFASs (polymeric PFASs included). If total fluorine exceeds 50 mg F/kg the manufacturer, importer or downstream user shall upon request provide to the enforcement authorities a proof for the fluorine measured as content of either PFASs or non-PFASs. For plastic parts exceeding 25 g manufacturer shall provide a declaration which declares the materials used in the production meet the above-seen requirement.
Mercury	DIN EN 1483	Mercury is not allowed for a backlight unit
Beryllium	DIN EN ISO 11885	Refers to 0.1% in each finished part of the article (all sub-products which can be separated without tools) and each packaging separately.
Antimony	DIN EN ISO 11885	Refers to 0.1% in each finished part of the article (all sub-products which can be separated without tools) and each packaging separately.

Requirement	Regulation	Limit
Packaging testing	Directive 94/62/EC and amendments	Limit: Pb+ Hg+ Cd+ Cr(VI) < 100 mg/kg
	MOSH and MOAH; French Arrêté du 13 avril 2022	The ban applies to the use of mineral oils: · For MOAH, if the printing ink contains more than 0.1 % or the mass concentration of compounds with 3 to 7 aromatic rings in the printing ink is more than 1 ppm (mg/kg); · For MOSH, the limit value in the printing ink is 0.1 %.
Battery Regulation	Regulation (EU) 2023/1542	Limit: Hg 0.005% Cd 0.002% and Pb 0.01%

Methodology for assessing and demonstrating compliance:

The applicant shall provide test reports issued by TÜV Rheinland, or by a laboratory accredited by one of ILAC MRA signatories according to ISO/IEC 17025 and holding accreditation scope that cover the standards relevant to substances listed in 5.1. Testing reports are deemed valid for a period of 12 month* from date of test sample submission up to the date of review. Reports should be issued for the complete finished product.Component reports shall not be accepted. Declaration of Compliance shall be provided, covering all legal requirements of the target markets as well as the spot-checked parameters: REACH Substances of Very High Concern (SVHC) and biocides.

Additionally the applicant shall provide a written declaration from the manufacturer according to DE-UZ 160 annex P-L and a written declaration from the plastic manufacturers according to DE-UZ 160 annex P-M. For declaration the templates from DE-UZ 160 shall be used or comparable templates according to ISO/IEC Guide 22.

For restricted substances, where a substitution at the time being due to missing alternatives is not possible, or the technology cannot be achieved at this stage, an exemption maybe granted. To support this exemption the supplier has to provide technical assessment and relevant documents.

The applicant provides a certificate(s) or accredited test report, which shows compliance with the legal requirement of each respective substance. TÜV Rheinland reviews that limits are kept. Alternatively, TÜV Rheinland evaluates the values by the provided product data from the manufacturer.

* Valid period could be extended to 5 years in maximum if applicant could guarantee through appropriate means that the materials are not changed since the initial testing.

TÜV Rheinland reserves the right to accept existing reports issued by accredited laboratories.

5.2 Electromagnetic Radiation (Health)

The electromagnetic radiation of devices with one or more wireless interfaces and a total transmission power of 10 mW or more shall pass the following requirement.

Requirement	Regulation	Limit
Electromagnetic Radiation	Directive 2014/53/EU	RF Power < 20 mW, require calculation/ declaration as per EN 62479 RF Power > 20 mW & distance > 20 cm, require calculation/declaration as per EN IEC 62311 RF Power > 20 mW & distance < 20 cm, require SAR measurement as per EN IEC/IEEE 62209-1528

Methodology for assessing and demonstrating compliance:

The applicant shall provide calculation, declaration and/or test reports according to the above mentioned standards.

5.3 Sustainable use of resources

5.3.1 Energy Efficiency

5.3.1.1 Power Consumption

The router shall comply with the following requirement.

Requirement	Regulation	Limit
Power Consumption	Code of Conduct on Energy Consumption of Broadband Equipment	The product shall not exceed the electric power consumption limits set out in the Broadband Equipment Code of Conduct Version 9.1* for both in “Ready-state” and “On-state” under the measurement conditions defined for each state.

The product shall be in compliance with these limits for the individual device configuration (each network port).

Power consumption of the external power supply shall be included in the power measurement.

* In case of a revision of the code of conduct the latest version shall be applied.

Methodology for assessing and demonstrating compliance:

The applicant shall provide test reports issued by TÜV Rheinland, or by a laboratory accredited by one of ILAC MRA signatories according to ISO/IEC. At least three samples have to be tested. Testing reports are deemed valid for a period of 12 months from date of test sample submission up to the date of review. Reports shall be issued for the complete finished product. Additional spot checks may be carried out by TÜV Rheinland in a risk based approach.

5.3.1.2 Defined Transition Time

The router shall comply with the following requirement.

Requirement	Regulation	Limit
Transition Time	DE-UZ 160	The product must feature automatic fallback to Ready state that sets the device to Ready state within a transition period of no more than 5 minutes after processing a payload in On mode.

Methodology for assessing and demonstrating compliance:

The applicant shall provide test reports issued by TÜV Rheinland, or by a laboratory accredited by one of ILAC MRA signatories according to ISO/IEC. At least three samples have to be tested. Testing reports are deemed valid for a period of 12 month from date of test sample submission up to the date of review. Reports shall be issued for the complete finished product. Additional spot checks may be carried out by TÜV Rheinland in a risk based approach.

5.3.1.3 Power Management Requirements

The router shall comply with the following requirements. The router must be designed so that unneeded functionalities can be individually switched on and off by the users or individual energy-saving settings can be made. In addition, the router's electrical power consumption during active operation must be both functionally and load dependent. The router must have automatic power management, which will reduce electrical power consumption to a minimum, in a timely and functionally appropriate manner.

Requirement	Regulation	Limit
LAN	DE-UZ 160	• The electric power consumption of unused LAN ports, i.e. ports with no cable connected as well as ports with a nonactive device connected shall be minimized automatically. • Product with Gigabit Ethernet ports shall detect connections to devices with Fast Ethernet ports and adapt the power consumption.

WLAN	DE-UZ 160	• The user shall be allowed to permanently deactivate the WLAN module by using a switch on the housing. • The user shall be allowed to program the product so that the WLAN radio module can be switched on and off following a time schedule. • The product must reduce the WLAN transmission power of the WLAN module when there is no terminal device registered. • 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. • The user shall be allowed to enable and disable the respective unused WLAN radio frequency 2.4GHz, 5GHz or 6GHz by either programming or by means of a mechanical switch.
DECT	DE-UZ 160	• The user shall be allowed to enable and disable a DECT interface by either programming or by means of a mechanical switch. • DECT shall be disabled on delivery.
mobile communication s interface	DE-UZ 160	• The 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.
Menu	DE-UZ 160	• 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.

Methodology for assessing and demonstrating compliance:

The applicant shall declare compliance with these requirements and mark the appropriate passage of the product documentation indicating the functions.

The TÜV Rheinland may carry out additional spot checks on products on a risk basis.

5.3.2 Recycle Design

5.3.2.1 WEEE

The final product shall compliance with following requirements:

Requirement	Regulation	Limit
WEEE	Directive 2012/19/EU and amendments	80 % shall be recovered, and 80 % shall be prepared for re-use and recycled;

Methodology for assessing and demonstrating compliance:

The applicant shall provide an evaluation report and TÜV Rheinland carries out a verification of the reports according to WEEE Directive 2012/19/EU and amendments.

The recovery and recycling rates of the materials used in the WEEE report shall be reasonable. TÜV Rheinland reserves the right to request the applicant to provide the supporting documents for the recovery and recycling rates of materials used in the WEEE report.

5.3.2.2 Recycled(post-consumer) Material Content

The product shall comply with the following requirement.

Requirement	Regulation	Limit
Recycled (post-consumer) plastic material content for product	ISO 14021 or equivalent standard	≥ 50% post-consumer recycled material content of plastic parts (Enclosure and stand, excluding PCB, cable, label and electronic components) of the product.

Methodology for assessing and demonstrating compliance:

The applicant shall provide the certificate(s) or accredited test report(s) per ISO 14021 or equivalent standard for recycled material(s) from accredited third party laboratories to TÜV Rheinland for reviewing. The certificate or test report shall not be older than 1 year.

TÜV Rheinland reserves the right to accept existing reports issued by accredited laboratories.

Any external power supplies used for CPE are not required to use recycled material.

In case the applicant is not able to provide the certificate or test report from accredited third party aboratories or on any risk basis from TÜV Rheinland, the applicant should provide following documents to TÜV Rheinland for reviewing. An on-site verification at manufacturing site(s) may be conducted also by TÜV Rheinland if need.

- Raw materials procurement records (such as contracts / receipts / invoices, etc.).
- Recycled products formulation specifications (ex:Stuffing RPET 100% + Softboa RPET 100%+ PV Boa RPET 100% + XXXX).
- Recycled material manufacturing process flow chart.
- Recycled source documents (Ex: GRS).
- Production of recycled products (the amount of data related products a year, or the amount of data produced during the validation of the subject matter, including the feeding amount/volume of output/loss amount).
- Recycled products production records(input/sales/monthly reports/inventory records).
- Products sales sheet.

5.3.2.3 Recycling Strategy

The applicant has to provide a detailed recycling strategy. The product shall be designed so as to allow a low-effort separation of significant material fractions, such as plastics, ferrous metal, copper and aluminium.

Requirement	Regulation	Limit
Recyclable by material	DE-UZ 160	• The product shall be designed so as to allow a low-effort separation of significant material fractions, such as plastics, ferrous metal, copper and aluminum. • 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).

Methodology for assessing and demonstrating compliance:

The applicant shall provide information according their recycling strategy concerning the tested product. Additionally the applicant shall provide a declaration concerning recyclability of housing parts/chassis.

5.3.2.4 Design Optimised for Recycling

The product 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

Product should utilize commonly used fasteners for joining components, subassemblies, chassis and enclosures; an exception shall be provided for special fasteners needed for safety and/or anti-theft reasons.

The variety of types of fasteners shall be kept to a minimum so only a single tool or limited number of tools are needed for disassembly.

Non-separable connections (e.g., glued, welded) between different materials shall be avoided unless they are compatible for recycling or technically or legally required or utilized for safety purposes or in an anti-theft application.

Methodology for assessing and demonstrating compliance:

The applicant shall provide a description of disassembly (e.g. as part of the recycling strategy).

5.3.2.5 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:

Requirement	Regulation	Limit
Types of plastic	DE-UZ 160	• Only the plastic types ABS, PC, HIPS, PE and PP are approved for the individual plastic parts. Furthermore, the use of plastic composites of PC and ABS is permissible, provided that these consist of post-consumer recycled materials. • The plastic housings must be recyclable by material.
Marking	DE-UZ 160	• Plastic parts with a mass greater than 25 grams each and an even surface area of more than 200 mm² shall 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.
Coatings	DE-UZ 160	• Galvanic coatings and other metallic coatings of plastic housing parts shall not be permitted.

Methodology for assessing and demonstrating compliance:

The applicant shall provide a declaration according to the above mentioned requirements.

Marking will be tested on the product.

5.3.2.6 Take Back

The applicant shall meet the following requirements concerning product take back.

Requirement	Regulation	Limit
Take Back	DE-UZ 160	• The applicant undertakes to take back ecolabelled and own-manufactured products after use in order to channel them with preference to reuse or to material recycling. • 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.

Methodology for assessing and demonstrating compliance:

The applicant shall declare compliance with the requirements and provide information concerning product take back (e.g. as part of the recycling strategy, name of the take-back system, extended producer responsibility schemes used in each country).

5.4 Product Climate Resilience

The producer shall quantify/assess the life cycle carbon emissions of products using life cycle assessment techniques, i.e. by describing the inputs and their associated emissions attributed to the delivery of a specified amount of the product functional unit.

Total life cycle carbon footprint and carbon footprint of the product's life cycle stages(at a minimum, raw material, manufacturing, use, distribution, and end-of-life).

Methodology for assessing and demonstrating compliance:

The applicant shall provide a report of Product Carbon Footprint (PCF) using ISO 14067, or Life Cycle Assessment using ISO 14040 & ISO 14044 or ITU-T L.1410. The report shall be issued by, or verified/critical reviewed by TÜV Rheinland.

TÜV Rheinland encourages applicants to disclose their carbon footprint reports and to continuously plan the carbon reduction path of their products. If possible, it is advisable to re-evaluate the carbon reduction of the product during the annual renewal of the Green Product Mark certificate.

6 Product function characteristics

6.1 Durability, Repair and Reuse

Requirement	Regulation	Limit
Warranty	DE-UZ 160	• The applicant undertakes to offer a two-year warranty on the product, at no extra cost.
Software Updates	DE-UZ 160	• The applicant undertakes to make functional and 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 product documents shall provide information on how to implement software updates.
Repair and Spare Parts Availability	DE-UZ 160	• 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 product documents shall provide information on the assembly of components, spare parts supply and repair services.
Replaceability of Rechargeable Batteries	DE-UZ 160	• Rechargeable batteries shall be replaceable by the user without the need for any special tools and without the risk of damage. • Rechargeable batteries must meet the current requirements of DIN EN IEC 62133 and DIN EN IEC 61951-2.
Replaceability of Hard Disk Drives and Mass Storage Devices	DE-UZ 160	• 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. • Instructions on how to remove the mass storage device shall be made available to the user.
Data Deletion	DE-UZ 160	• The user shall be able to completely and securely delete all personal data without the help of pay software. • The device shall provide a software function that resets

		the device to its factory settings.

Methodology for assessing and demonstrating compliance:

The applicant shall declare compliance with the requirements.

6.2 Longevity

The product shall comply with the following requirement.

Requirement	Regulation	Limit
Longevity (For CPE and external power supply)	-	Electrolytic capacitors in their particular application for temperature and ripple current, the lifetime shall achieve more than 55000 hours (approx. 6 years).

Methodology for assessing and demonstrating compliance:

The applicant shall provide an evaluation report and TÜV Rheinland carries out a verification of the reports.

6.3 User Guide Information

The router shall come with a short guide and operating instructions including at least the following user information.

Requirement	Regulation	Limit
Operating Instructions and Short Guide	DE-UZ 160	• Instructions for analogously displaying the status of the operating states of the product or individual interfaces on the device (e.g. LED displays). • Instructions for digitally displaying the status of the operating states of the product 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. • Instructions for energy efficient use of the product, including instructions for automatic and manual power management as well as for an optimal positioning of the product in a room.

		• Instructions for battery removal (if any). • Instructions for mass storage module removal (if any).
Operating Instructions and Short Guide of a product equipped with one or more radio transmitters	DE-UZ 160	• Operating Instructions and Short Guide of a product 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 product.

Methodology for assessing and demonstrating compliance:

The applicant shall provide the operating instructions and short guide demonstrating that the information listed above is available.

The short guide shall be enclosed with the device on paper. It is not required that all the set of operating instructions is also provided on paper, but they can also be on electronic or other data storage format, and the access method for user shall be provided.