TÜVRheinland®

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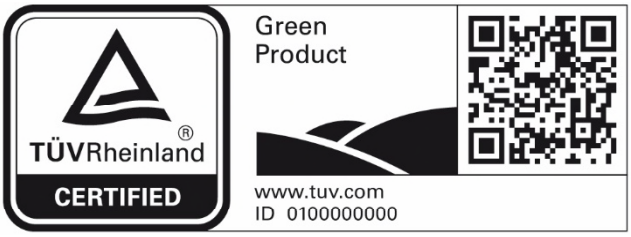
Criteria for the Award of Green Product Mark

Set-Top Boxes



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 Set-Top Boxes shall comply with, in order to get awarded with Green Product Mark.

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*
- ISO 14040, *Environmental management -- Life cycle assessment – Principles and framework*
- ISO 14044, *Environmental management – Life cycle assessment – Requirements and guidelines*
- Product Environmental Footprint (PEF) Guide
- 2001/95/EC General Product Safety Directive
- ISO/TS 14067, Carbon footprint of products – Requirements and guidelines for quantification and communication
- PAS2050:2011, Specification for the assessment of the life cycle greenhouse gas emissions of goods and services
- ISO 14021, Environmental labels and declarations–Self-declared environmental claims (Type II environmental labelling)
- WEEE Directive 2012/19/EU
- RoHS Directive 2011/65/EU
- REACH Regulation (EU) No 1907/2006
- ISO 11469, Generic identification and marking of plastics products
- Packaging and packaging waste Directive 94/62/EC
- POP Regulation (EU) No 2019/1021
- RED Directive 2014/53/EC
- (EC) No. 1275/2008, (EC) No. 801/2013, (EC) No. 2019/1782
- RAL-UZ 196

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 launched 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 Simple set-top boxes (SSTB)

A simple set-top box means a stand-alone device which, irrespective of the interfaces used, has the primary function of converting standard-definition (SD) or high-definition (HD), free-to-air digital broadcast signals to analogue broadcast signals suitable for analogue television or radio; has no 'conditional access' (CA) function; offers no recording function based on removable media in a standard library format.
An SSTB can be equipped with the following additional functions and/or components which do not belong to the minimum specifications of an SSTB:

- time-shift and recording functions using an integrated hard disk
- conversion of HD broadcast signal reception to SD or HD video output
- a second tuner

3.3 Complex set-top boxes (CSTB)

A complex set-top box (CSTB) means a device equipped with a conditional access technology that uses a dynamically allocated key for decoding signals; its main functions are to receive, decode and process data from digital broadcasting streams and related services. The device can have the capability to decode and output audio and video signals and/or the capability to supply content via a home network to one or more thin-client/remote CSTBs. The term "complex set-top box" covers the base functionality of receiving cable, satellite, IP, terrestrial or thin-client/remote signals.

3.4 Prerequisites

Preconditions that a product shall comply with to be awarded TÜV Rheinland's Green Product Mark, which in principle are comprised 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: 1999, definition 3.4]

3.6 Product function characteristics

Attribute or characteristic in the performance and use of a product. In the context of environmental labelling, fitness for purpose implies that a product satisfies health, safety and consumer performance needs. [SOURCE: ISO 14024: 1999, 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

- shall fulfil the requirements of SA 8000 (Evidence with a valid SA 8000 certificates or SA 8000 audit reports by TÜV Rheinland), or
- are a full member of Responsible Business Alliance (RBA) and can provide documented proof of third party audits reports, or
- submits a report according to the GRI standards.

The documented proof/report mentioned in any of the above 3 options shall be a maximum of 12 months old at the time of application for Green Product Mark certification as stipulated in EN ISO/IEC 17021.

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 Protection of human and environmental health: 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, with reference to 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. In addition, 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 % for 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 and XVII	Refers to 0.1 % for each homogenous material of the product
Alkylphenols and Alkylphenolethoxylates	With reference to Regulation (EC) No 1907/2006	100 mg/kg each (NP/OP) / 100 mg/kg each (NPEO/OPEO)
Organotin Compounds	With reference to Regulation (EC) No 1907/2006	0.1 mg/kg :TBT; 1 mg/kg: MBT, DBT, DOT
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)	Reference to Regulation (EC) No 1907/2006	1000 mg/kg (All materials except metals, glass, ceramic and wood)
Cadmium	Regulation (EC) No 1907/2006	100 mg (materials not covered by RoHS)
Lead	Regulation (EC) No 1907/2006	90 mg/kg (accessible materials not covered by RoHS)
PAH (Polycyclic Aromatic Hydrocarbons)	15 PAH according to AfPS GS 2019:01 PAK	Requirements set by AfPS
Halogen	IEC 61249-2-21 and IPC-4101B	Cl, Br: 1000 mg/kg (in each material)

Requirement	Regulation	Limit
		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 a 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
Packaging testing	Directive 94/62/EC and amendments	Pb+ Hg+ Cd+ Cr(VI) < 100 mg/kg Use of recyclable fiber-based packaging materials: minimum percentage of overall packaging: 70% Post-consumer recycled plastic packaging: minimum percentage: 5%.
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.
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.
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)
Hexabromocyclododecane (HBCDD)	Regulation (EU) No 2019/1021 on persistent organic pollutants (POP) Annex I	Refers to 0.01 % in each finished material of the article and each packaging (made of EPS and PS foams)
Packaging testing	Directive 94/62/EC	Pb+ Hg+ Cd+ Cr(VI) < 100 mg/kg

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.

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

5.2 Sustainable use of resources

5.2.1 Energy Efficiency

5.2.1.1 General requirements

The product shall comply with the following general requirements (in accordance with DE-UZ 196).

- Set-top boxes must feature at least one standby mode and be capable of being switched to a standby mode upon user command.

- The STBs must feature an automatic switch-off function ("auto-power down", APD) that has been activated as default in the factory

  User APD: The device switches into a standby mode after a certain period of time without user interaction; the APD time must be set as default by the manufacturer to a maximum of 4 hours. Before the device switches into the APD standby mode, a graphical user interface can request that the user confirms whether the device is still being used; in this case, the device shall only switch over to standby mode when the user has not responded within an (additional) specified period of time.

  System APD: Devices with network standby functionality must be capable of switching to standby mode after a certain period of time with no request for service. The APD time must be set as default to 20 minutes.

- The device must be capable of exiting the standby mode with the aid of an integrated timer in order to download content, search for programme, system or scheduling information or to perform other maintenance tasks. Following the completion of these tasks, the device must switch back to the original standby mode within a maximum of 15 minutes.

- The devices must be designed in such a way that they can be disconnected from the mains power supply from time to time by the user. The device should function without any problems after it is reconnected to the mains power supply.

- In the case of those devices supplied by service providers that feature a "speculative recording" function (automatic recording based on user preferences), they must have a user-accessible menu option enabling the user to deactivate this function where desired.

Methodology for assessing and demonstrating compliance:
The applicant shall provide a declaration according the above mentioned requirements. Additionally the applicant provide test reports issued by TÜV Rheinland, or by a laboratory accredited by one of ILAC MRA signatories according to ISO/IEC 17025. Testing reports are deemed valid for a period of 18 month from date of test sample submission up to the date of review. Additional spot checks may be carried out by TÜV Rheinland in a risk based approach.

5.2.1.2 Energy consumption

The product shall comply with the following general requirements.

CSTB:

Requirement	Regulation	Limit
Annual energy consumption -	RAL-UZ 196*	The total annual energy consumption for the relevant base and additional functionalities on complex set-top boxes must fall below the allowances defined in the "Voluntary Industry Agreement to improve the energy consumption of Complex Set Top Boxes within the EU", Version 6.0 (2018-04-02) that have been effective since 1 July 2018 (Tier 4) by at least 50 percent.

SSTB:
The STB shall comply with the requirements of directive (EU) 107/2009.

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. Testing reports are deemed valid for a period of 18 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.

5.2.2 Recycle Design

5.2.2.1 WEEE

Requirement	Regulation	Limit
WEEE	Directive 2012/19/EU and amendments	Recycling content ≥ 80%.

Methodology for assessing and demonstrating compliance:

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

5.2.2.2 Recycled (poster consumer) plastic material content

Requirement	Regulation	Limit
Recycled (post-consumer) plastic material content	Verification ISO14021:1999, National Green Schemes (Eco Label, IEEE 1680:2006, etc.)	≥ 50% post-consumer recycled material content of plastic parts (Enclosure and stand, excluding PCB, cable, label and electronic components) of the product. Applicable for products tested after 31.12.2019.

Methodology for assessing and demonstrating compliance:

The applicant shall provide the declaration that states post-consumer recycled material content of plastic part (Enclosure, frame, excluding PCB, cable, label and electronic components) of the product shall not less than 50%.

5.2.2.3 Recycling strategy

The applicant has to provide a recycling strategy:

- Devices must be designed so that they are easy to dismantle for recycling purposes in order to ensure that housings, hard drives and printed circuit boards can be separated as fractions from materials of other functional units and, if possible, recycled by material type.

- It must be possible for the device to be dismantled manually by a specialist company with the aid of universal tools15 and for this process to be carried out by a single person.

- Electrical/electronic components must be easy to remove from the housing.

- 90% of the mass of the plastics and of the metals used for the housing parts and chassis must be recyclable by type of material (this does not include 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. The applicant shall provide a description of disassembly (e.g. as part of the recycling strategy).

5.2.2.4 Material Selection

The applicant shall meet the following requirements concerning product material selection (in accordance with DE-UZ 196).

- The following is valid for plastic parts with a mass greater than 25 grams: A maximum of 4 types of plastic may be used for these parts. The plastic housings may only consist of a maximum of two separable polymers or polymer blends.

- Plastic parts with a mass greater than 25 grams and an even surface area of more than 200 square millimetres shall be permanently marked in accordance with ISO 11469, while taking ISO 1043, Parts 1 to 4, into consideration. Transparent plastic parts whose function requires transparency (e.g. visible displays) shall be exempt from labelling according to ISO 11469.

- It is not permitted to apply metallic coatings to plastic housing parts.

- The use of (post-consumer) recycled materials is permitted in the housing parts and chassis. They may be used on a percentage basis.

Methodology for assessing and demonstrating compliance:

The applicant shall provide a declaration according the above mentioned requirements. Marking will be tested at the product.

5.2.2.5 Take Back

The applicant shall meet the following requirements concerning product take back (in accordance with DE-UZ 196).

- 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.
- 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 provides information concerning product take back (e.g. as part of the recycling strategy).

5.3 Evaluation of product climate resilience

The producer shall quantify/assess the life cycle greenhouse gas 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.

Methodology for assessing and demonstrating compliance:

Option 1: The applicant shall provide a report of Product Carbon Footprint based on PAS 2050 or ISO/TS 14067. The report shall be verified by an independent third-party.

Option 2: The applicant shall provide a report of Life Cycle Assessment using ISO 14040 and ISO 14044. The report shall at least include the environmental impact category Global Warming Potential and shall be reviewed by an independent third-party.

The critical review process shall ensure that (source: ISO 14044:2006):

- the methods used to carry out the LCA are consistent with this international standard,
- the methods used to carry out the LCA are scientifically and technically valid,
- the data used are appropriate and reasonable in relation to the goal of the study,
- the interpretations reflect the limitations identified and the goal of the study, and
- the study report is transparent and consistent.

The minimum necessary score to qualify as a reviewer or a review team is six points, including at least one point for each of the three mandatory criteria (i.e. verification and audit practice, LCA methodology and practice, and knowledge of technologies or other activities relevant to the study).

Table 1: Scoring system for eligible reviewers/review teams (source: Product Environmental Footprint Guide)

Topic		Criteria	Score (points)				
			0	1	2	3	4
Mandatory criteria	Review, verification and audit practice	**Years of experience**	0 – 2	3 – 4	5 – 8	9 – 14	> 14
		Number of reviews	0 – 2	3 – 5	6– 15	16 – 30	> 30
	LCA Methodology and practice	**Years of Experience**	0 – 2	3 – 4	5 – 8	9 – 14	> 14
		Experiences of participation in LCA work	0 – 4	5– 8	9 – 15	16 – 30	> 30
	Technologies or other activities relevant to the study	**Years of experience in private sector**	0 – 2 (within the past 10 years)	3 – 5 (within the past 10 years)	6 – 10 (within the past 20 years)	11 – 20	> 20
		Years of experience in public sector	0 – 2 (within the past 10 years)	3 – 5 (within the past 10 years)	6 – 10 (within the past 20 years)	11 – 20	> 20
Other	Review, verification and audit practice	Optional scores relating to audit	▪ 2 points: Accreditation as third party reviewer for at least one EPD Scheme, ISO 14001, or other EMS. ▪ 1 point: Attended courses on environmental audits (at least 40 hours). ▪ 1 point: Chair of at least one review panel (for LCA studies or other environmental applications). ▪ 1 point: Qualified trainer in environmental audit course.				

6 Product function characteristics

6.1 Durability, Repair and Reuse

The applicant shall meet the following requirements concerning Software Updates (in accordance with DE-UZ 196).

- It must be possible to update the software on the set-top boxes via the device menu.
- The applicant undertakes to make functional and security-related software updates for at least four years from the time that production ceases.
- The product documents shall provide information on how to implement software updates.

The applicant shall meet the following requirements concerning Repair and Spare Parts Availability (in accordance with DE-UZ 196).

- The applicant undertakes to make sure that the provision of spare parts for the repair of the devices and the repair of the required infrastructure is guaranteed for at least 3 years following the termination of production and that the customer is informed about this guaranteed availability of spare parts.

- Spare parts are those parts, which typically, may break down within the scope of the ordinary use of a product. Whereas those parts which normally exceed the life of the product are not to be considered as spare parts.

Methodology for assessing and demonstrating compliance:

The applicant shall declare compliance with the requirements

6.2 Longevity

The applicant shall meet the following requirements concerning longevity.

- Electrolytic capacitors in their particular application for temperature and rippel current, the life time 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 documentation included with the devices shall include both the technical specifications and also environmentally-relevant consumer information. The documentation shall thus include at least the following user information ((in accordance with DE-UZ 196):

a) Total annual energy consumption (TEC) in kilowatt hours (kWh/year) in accordance with Paragraph 5.2.1.2 for CSTB, as well as the power consumption in the different operating modes. In addition, information must be provided to explain how to switch the device to the energy-saving modes.

b) Information that the device also consumes electricity in standby mode, even if in some cases the display has been deactivated.

c) Information that lengthening the preset time for the automatic switch-off function (APD) or deactivating the APD function altogether can lead to an increase in energy consumption.

d) Information that reducing energy consumption is directly linked to lower operating costs and that energy consumption can be reduced to zero if the device is completely disconnected from the mains socket outlet; additional information to confirm that completely disconnecting the device from the mains socket outlet will not lead to any deterioration in the performance of the device for the user.

e) Instructions that enable the user to deactivate the "speculative recording function" – if available.

f) Information on the possibilities for adapting the device to technical changes in accordance with Paragraph 6.1.

g) Information on repairability in accordance with Paragraph 6.1.

h) Information on the possibility of returning used devices to the applicant for the purposes of repair or recycling in accordance with Paragraph 5.2.2.5.

i) Information on environmentally-friendly disposal at the end of the device's service life.

Methodology for assessing and demonstrating compliance:

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