LONGTIME®

Certification standard

Over-ear headphones

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I. GENERAL INFORMATION

Based on the EN45550 series of standards, and consistent with EN45552 and EN45554, the LONGTIME® specific standards specify elements relating to the study of the robustness, reliability and repairability of the associated product family.
All qualitative, semi-quantitative and quantitative data are derived from a research and consultation process, as required by current standards, and take into account bibliographical references (scientific studies, regulations, standards, etc.) and all stakeholders involved.) and all stakeholders, i.e.: marketers (manufacturers, importers, distributors), their suppliers and/or subcontractors, product experts (repairers, installers, professional testers), spare parts professionals, reconditioners, consumers, consumer associations, environmental associations and any other stakeholder who can contribute, subject to added value and the availability of networks and information.

LONGTIME® vision

This project is part of a dynamic social movement, with the aim of moving ahead of regulations. This label is made by citizens, for citizens. It provides the certainty that the product bearing the label is manufactured for long-term use, as desired by the majority of consumers, and that it is economically repairable.
LONGTIME® is a simple, powerful and effective tool, designed to inform consumers who are concerned about the overall impact of their purchases, as well as those who wish to acquire a product with a fair longevity/price ratio. It also aims to put the spotlight on manufacturers keen to offer products with an optimized lifespan.

Label objectives

The aim is to encourage a different kind of consumption, with a view to producing differently. Virtually all citizens would like to see a transformation of the consumer society, with a real paradigm shift in technical and economic thinking, in order to consume better and more sustainably.
As studies « Modélisation et évaluation environnementale de produits de consommation et biens d'équipement » and « Évaluation environnementale et économique de l'allongement de la durée d'usage de biens d'équipements électriques et électroniques a l'échelle d'un foyer » from the Agence De l'Environnement et de la Maîtrise de l'Énergie Française (ADEME) show, the ecological interest is major: in the space of a few decades, we have multiplied our consumption of raw materials to over 60 billion tonnes a year.
The label helps to preserve the planet's resources by making better use of them and reducing waste.

Intuitively, then, buying a product with an optimized lifespan encourages the rational use of our planet's resources, reduces over-consumption and helps us to move away from disposable and wasteful products. It's not a question of looking for "immortal" products, but rather of fighting against the short lifespan of products.

Impact of durability of over-hear headphones

The life cycle analysis of a wireless over-ear headphone reveals that the manufacturing phase accounts for the majority of its environmental impacts. This is primarily due to the presence of miniaturized electronic components, complex printed circuit boards, and lithium-ion batteries. The extraction of critical raw materials such as cobalt, lithium, copper, and rare earth elements generates significant impacts in terms of climate change, depletion of mineral and fossil resources, and acidification of ecosystems. The manufacturing of these components, often located in regions with carbon-intensive energy mixes, further exacerbates these impacts. Over the product's life cycle, the use phase has a moderate impact, mainly related to electricity consumption for recharging, while the end-of-life stage offers limited avoided impacts due to low recyclability of rare materials and the lack of optimal recycling infrastructures.

In this context, extending the product lifespan of headphones significantly contributes to reducing their overall environmental footprint. A prolonged use helps to amortize the fixed impacts of production over a longer functional period. This shift improves environmental efficiency per unit of use. Thus, a durable, repairable headphone that remains in operation for several years helps to reduce pressure on abiotic resources and limits greenhouse gas emissions. This effect is especially relevant in a market where products are often replaced due to perceived rather than technical obsolescence.

Maintaining the product in working condition, enabling replacement of key components (battery, earpads, headband, etc.), and ensuring mechanical and electronic robustness are essential levers. Designing for repairability, modularity, and durability is therefore crucial to managing the environmental impacts of this product category.

Fields of application

The label is applicable to various product families as long as there is an assembly of parts. LONGTIME® aims to cover domestic appliances, electronics, hand-held electrical appliances, furniture, leisure equipment, professional equipment, etc. The range of products is therefore very broad, but excludes automotive, textile (excluding leather goods), food, cosmetics and chemical products.

Reference system organization

The criteria are broken down into 3 main families and grouped into 9 categories. The criteria are presented as follows:

Criteria category

Criteria subcategory

1. Criteria number and name

Each criterion is identified by a number and a name corresponding to its specific theme. In all, there are 38 criteria.

Time marker (Associated with each criterion Cf table below)

Criteria **TO**	These criteria must be met to qualify for certification after the initial audit (year N).
Criteria **T1**	These criteria must be met by at least 70% at the time of the audit. Corrective action will be taken to achieve 100% compliance by year N+1.

CROSS-CUTTING CRITERIA
Criterion applicable to all product categories

- Product Specific Requirement (PSR)
  - Specific criterion whose scope is adapted to the product category of the standard.

Means of proof: Details of the means of proof required and/or relevant to the assessment of the criterion and its PSR.

Control system

Compliance with the standard's criteria is assessed by an independent, accredited inspection body.
Each criterion is assessed according to a compliant/non-compliant approach. Assessment of compliance with the criteria is carried out by an approved, independent inspection body, using auditors who must be qualified by the label manager and who have received initial training in the entire LONGTIME® programme in order to ensure efficient control.
For more details on the control system used in the labeling process, click here:
https://www.longtimelabel.com/conditionslongtime

Standards and regulations

The standards and regulations cited in the standard are based on the most recent versions and/or equivalents published in the Official Journal of the European Union.

General mode of proof

A series of documents and administrative procedures are useful for establishing proof of compliance with various criteria:

- Visual inspection by mandated third-party auditor during in-situ audit
- All European legislation applicable to the product family, in particular: technical specifications referred to in article 12, paragraph 5 of the REGULATION (UE) 2017/1369 present in the European Commission's product conformity database (CE marking database), EMC, ROHS, WEEE, machine safety directives
- Technical specifications for components, materials, coatings and internal or supplier processes
- Quality certification and type 1 or 2 label (Iso 9001, Iso 14001)
- Quality assurance
- Test data
- After-sales service data
- Any documentation/software to support compliance, such as :
  - Internal product data sheet
  - Functional analysis tool

        - Design study (function, materials, usage constraints)
        - Performance and endurance testing
        - Qualification phase and test
        - Failure rate study
        - Operating instructions
        - Maintenance manual
- Terms and conditions of sale

II. PRODUCT SCOPE DEFINITION

This sector-specific standard applies to over-ear headphones designed for personal audio playback. These products are primarily intended for private or semi-professional use (e.g., music listening, phone calls, online conferencing), and include integrated electromechanical systems such as speakers, Bluetooth modules, batteries, and user interface controls (e.g., buttons, wheels, touchpads).

The products concerned feature rechargeable batteries and are mainly operated wirelessly via Bluetooth or similar short-range transmission technologies. They often include wired backup options (e.g., 3.5 mm jack) for extended compatibility. Many models integrate smart functionalities, including active noise cancellation, microphones, or voice assistants.

The scope of this standard focuses exclusively on audio headphones that are placed over the ears and include electronic components enabling powered operation.

Product scope

- Wireless over-ear (or on-ear) headphones with integrated rechargeable batteries.
- Over-ear headphones with wired connectivity (audio jack or USB-C).
- Foldable over-ear headphones

Outside product scope

- In-ear headphones and earbuds (wired or wireless).
- Hearing aids or audio-enhancement devices for medical use.
- Smart glasses or wearables with integrated audio features.

In the rest of the standard, **"over-ear headphones"** is replaced by "**headphones**".

III. NOMENCLATURE OF PARTS

This chapter details a typical nomenclature, representative of the target product group but not exhaustive. The various parts present in the BOM will then be prioritized by type of part.

- **Headband and Structure**
  - Outer headband (rigid structure)
  - Headband cover
  - Hinges and articulation joints
  - Headband slider mechanism (ratchet or rail)
  - Internal cabling (between earcups)

- **Earcups**
  - Outer ear cup shell
  - Ear cushions
  - Inner speaker mesh cover
  - Speaker driver
  - Internal earcup cabling

- **Audio and Connectivity**
  - Bluetooth module
  - Main PCB
  - Wired audio port (USB-C or jack)
  - Integrated microphone(s)
  - Detachable audio cable (jack / USB-C) / Fixed audio cable (integrated into earcup)

- **Battery and Power Supply**
  - Lithium-ion battery
  - Battery management system (BMS)
  - Charging port (USB-C)

- **User Interface**
  - Control buttons (volume, power, play/pause, scroll wheel or touchpad)
  - Status LED's)

- **Sealing and stabilization of mechanical connections**
  - Sealing mechanism (O-rings, rings, lips, silicone, etc.)
  - Holding mechanism (screws, bolts, circlips, washers, adhesives, etc.)

IV. PRIORITIZATION BY PARTY CATEGORY

Product housing

This covers all the parts used to protect the product's internal components from the outside world.

- **Headband and Structure**
  - Outer headband (rigid structure)
- **Earcups**
  - Outer ear cup shell

Functional parts

Parts related to the operation or use of the product without additional features.

- **Headband and Structure**
  - Headband slider mechanism (ratchet or rail)
  - Internal cabling (between earcups)
- **Earcups**
  - Internal earcup cabling
  - Inner speaker mesh cover
- **Audio and Connectivity**
  - Wired audio port (USB-C or jack)
- **Sealing and stabilization of mechanical connections**
  - Sealing mechanism (O-rings, rings, lips, silicone, etc.)
  - Holding mechanism (screws, bolts, circlips, washers, adhesives, etc.)

Priority parts

Parts that are functional but critical in the event of malfunction or breakdown (sometimes called critical parts).

- **Earcups**
  - Speaker driver
- **Audio and Connectivity**
  - Bluetooth module
  - Main PCB
  - Integrated microphone(s)
- **Battery and Power Supply**

    - Lithium-ion battery
    - Battery management system (BMS)
    - Charging port (USB-C)

- **User Interface**
    - Control buttons (volume, power, play/pause, scroll wheel or touchpad)

Vulnerable parts

Parts exposed to a high rate of accidental user breakage.

- **Headband and Structure**
    - Hinges and articulation joints

- **Audio and Connectivity**
    - Detachable audio cable (jack / USB-C) / Fixed audio cable (integrated into earcup)

Consumable or maintenance parts

Consumable parts are those parts that need to be replaced more or less frequently, depending on the pattern of deterioration over the product's lifetime. Maintenance parts require regular servicing to keep the product in optimum working order.

- **Earcups**
    - Ear cushions

- **Headband and Structure**
    - Headband cover

Aesthetic parts or accessories

Aesthetic parts that do not interfere with product operation. Elements that may be useful for the operation of an object or for adding additional functions without being part of it.

- **User Interface**
    - Status LED's
    -

V. CLASS OF REPARABILITY CRITERIA

1. Class system

The criteria in the "Repairability" family use a system of classes to prioritize the level of requirement for each type of part.
These classes range from A to E.
Class A represents best practice in reparability. The lower classes (B, C, up to D or E) reflect a decreasing level of relevance of practices, but should always be considered in relation to market practices.

The definition of classes is the subject of a study for each repository, in order to identify best market practices.

2. Disassembly depth of parts

The dismantling step count starts when the safety conditions for the user are met. A step is an operation leading to the removal of a part or a tool change. Example:

- Remove cover by sliding with hand = 1 step
- Remove cover by unscrewing 4 Phillips screws = 1 step
- Remove cover by unscrewing 2 Phillips and 2 Torx screws = 2 steps

VI. EXPOSURE TO EXOGENOUS FAILURES

Definition

An exogenous failure refers to a defect or problem in the manufactured product that occurs due to external factors or conditions beyond the control of the manufacturer or producer.
As opposed to an endogenous failure, which is linked to internal problems (design, manufacturing, quality), an exogenous failure is generally the result of unforeseeable external circumstances (e.g. extreme environmental conditions, transport accidents, inappropriate handling by the end-user, component failures from third-party suppliers, etc.).
Managing exogenous failures in product manufacturing may involve implementing quality control measures, rigorous testing, supply chain management, warranties and return policies to deal with problems that may arise due to these external factors.

Exogenous failure criteria

User risk:

Reflects the ability to respect conditions of use in the face of the weight of the constraints of use.
Associated levels:

- Low: the user scrupulously respects the product's rules of use, particularly for quality and safety reasons.
- Medium: the user generally respects the product's rules of use
- High: the user rarely respects the product's rules of use

Product handling:

Reflects the possibility of false handling, shocks, falls.
Associated levels :

- Low: Not handled
- Medium: Handling without moving or dismantling
- High: Handling with moving or dismantling

Weather exposure:

Refers to exposure to rain, hail, frost, wind, sand, lightning, dust, salt spray...
Associated levels:

- Low: No exposure (indoors)
- Medium: Indirect exposure (hold, station concourse)
- High: Direct exposure (outdoors)

Definition of the different phases

- Inactivity / Standby : The headset is turned off or not connected to an audio source. For wireless models, it may remain powered on but idle, in a standby state, awaiting connection.

- Usage Phase : The headset is actively used, connected to a device (smartphone, computer, tablet…), with audio playing (music, calls, gaming…). This phase includes repeated user handling, wearing/removing, and control interactions.

- Charging Phase : For wireless models, the headset is plugged into a power source to recharge the battery. Charging may occur during or outside of use.

- Transport / Storage Phase : The headset is being carried, stored in a bag or case, or hung on a support. This includes mobile phases where it may experience shocks, folding stress, or mechanical pressure.

Phase	User risk	Product handling	Weather exposure	Overall risk
Inactivity / Standby / Storage Phase	Medium	Low	Low	Low
Usage Phase	High	High	Medium	High
Charging Phase	Medium	Medium	Low	Medium
Transport / Storage Phase	Medium	Low	Low	Low

Assessment of the overall risk of exogenous failure: MEDIUM

This product category is subject to medium risk of exogenous failure. The main exogenous failure risks for product are as follows:

Inactivity / Standby / Storage phase

- Main risk: Deep battery discharge when the product is left unused for long periods, especially if not fully powered off or if the battery slowly drains in standby.
- Risk of cushion material degradation (drying, cracking) if stored in inappropriate environmental conditions (humidity, UV, dust), though this is less frequent.
- External exposure risks (e.g. weather, dust) are limited if proper storage is respected.
- Overall risk: Low, but battery longevity and user awareness are key issues in this phase.

Usage phase

- Repeated mechanical stress (folding, headband adjustment) can lead to fatigue failures or cracks.
- Potential for fall or shock during user movement or while wearing the product.
- Sweat, dust or humidity ingress in long usage periods may affect electronic or acoustic parts.
- High user interaction increases probability of misuse (e.g. twisting joints, pressing buttons too hard).
- Overall risk: High, this is the phase with the greatest mechanical and electrical stress.

Charging phase

- Damage to the charging port due to improper cable insertion or unstable connectors.
- Potential for improper charging habits (leaving plugged in too long, charging in unsuitable conditions).
- Risk of battery degradation due to repeated poor charging practices.
- Overall risk: Medium, critical for battery health and component integrity.

Transport phase

- Moderate user risk if the headset is transported without a case or is compressed in a bag.
- Most failures in this phase come from physical deformation or breakage under pressure.
- Overall risk: Low, provided basic precautions are taken.

Although over-ear headsets are not exposed to extreme environmental hazards by default, mechanical stress, battery care, and user behavior remain key exogenous risk factors. The label should ensure:

- Clear guidance on long-term storage and battery preservation
- Documentation that promotes correct handling, charging, and cleaning practices
- Durable and repairable construction for wear-prone parts (pads, cables, battery)
- Availability of protective accessories (e.g. transport case) to mitigate transport-related damage

VII. LABEL CRITERIA

Reliability

Conception

1. Stress resistance

T0 Criteria

The producer identifies the functions of the product and its components, as well as the associated critical use constraints. He demonstrates sustainable design choices, optimized by reliability and/or repairability strategies.

Mode of proof : General mode of proof supplemented by a set of data appropriate to the sub-criteria, including the application of product-related test standards: (This list of proof methods is representative but not exhaustive. It is not required to have all these modes of proof in order to comply with the criteria; they are merely indications)

- *In-warranty and out-of-warranty failure rates: The product must demonstrate failure rates below the industry average.*
- *Accelerated life testing. As the duration of the test is limited, scientific and robust projection calculations (acceleration factor) are used to extrapolate the results to the product's maximum total lifetime, demonstrating resistance to stress above the market sector average.*
- *The methodologies used can be based on general standards, on mandatory standards linked to safety directives and including elements of resistance to stress in use, or on voluntary standards.*
  - *EN 45552: General method for assessing the durability of energy-related products*
  - *EN 60721 : Classification of environmental conditions*
  - *IEC 60605 : Reliability testing of equipment*
  - *IEC 61123 : Reliability testing - Compliance test plans for pass rate*
  - *EN 61124 : Reliability testing - Compliance test plans for constant failure rate and constant failure intensity*
  - *EN 61649: Weibull analysis*
  - *EN 62506: Accelerated product test methods.*
  - *EN 61842: Microphones and headphones for voice communications*

- *Instruments used for testing: all instruments used for testing must be calibrated and a valid calibration report must be available. Calibration must be carried out prior to testing. Calibrations must be traceable to national standards.*

❖ **Resistance to mechanical stress**

- Shock and drop resistance :
  - Free fall test : resistance to falls from a height of 1.8 metres in 6 different positions, two for each position.

Mode of proof: IEC 60068-2-31 - Environmental testing - Part 2-31: Tests - Test Ec: impact due to rough handling, test primarily intended for equipment. No components come loose or break. The correct functioning of the product is maintained

- Abrasion resistance
  - The product must show good abrasion resistance on surfaces exposed to daily use (earphones, headband, visible external surfaces), with no peeling, cracking or significant loss of appearance after testing.

Mode of proof: ASTM D4060 – Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser. Taber test with CS-10 wheel, 500 g load, 500 cycles minimum, Mass loss ≤ 50 mg or no peeling, cracking or significant visual alteration of the painted surface or raw material. The surface remains homogeneous to the touch and to the naked eye.

- Resistance of critical parts to disassembly:
  - Product resistance, specifically of the component that hold the part, to 50 disassemblies and reassemblies for battery and slide arm, and 100 for earmuffs

- Vibration resistance:
  - Resistant to a vibration frequency of 200Hz for 60 minutes along 3 axes

Mode of proof: ASTM D 4169 - part no.12.4 - Standard Practice for Performance Testing of Shipping Containers and Systems

- Mechanical resistance of cables and connectors (audio / load): cables and their connectors must withstand repeated mechanical stress (torsion, bending, traction, impact, rotation) without breakage, major deformation or loss of functionality. Tests are carried out on the cable, the cable/plug junction (SR), and the connector plug.
  - Torsion : resistance to 5000 cycles at ±45° with a 500g load
  - Bending : resistance to 5000 cycles at ±45° with a 500g load
  - Traction : resistance to 5 Kg pull applied for 60 seconds
  - Cyclic plug-in test : resistance to 10000 cycles jack insertion/removal

Mode of proof:
- *IEC 60884 - Plugs and socket-outlets for household and similar purposes*
- *EN ISO 62680-1-3/EIA-364-09D - Insertion/extraction cycle resistance*
- *Lifting distance: 40cm～50cm and swing speed: 30 cycles/min*
- *The product is considered compliant if it shows no breakage, major visible degradation or loss of electrical continuity after testing.*

- Resistance of buttons and connectors
  - Resistance of buttons and controls to wear and repeated use : resistance to 50 000 cycles

Mode of proof:
- *Contact closure cycle Resistance ASTM-F1578-07*

- Crushing resistance (accidental compression)
  - Resistance to 5 total 180° headband flappings

Mode of proof: Static compression test according to ISO 12048. Headband no break or any damage. The difference in distance between the two earpieces before and after the test is less than 10mm.

- Product resistance mechanical movements (bending, extension, pulling, clamping, adjustments)
  - Resistance to 8000 opening/closing cycles earphone folding mechanism (for foldable headphones)
  - Resistance to 8000 cycles of 200mm helmet extension and evaluation of the clamping test for helmet wearer comfort over time.
  - Resistance to 8000 sliding arm adjustment cycles

Mode of proof: IEC 60068-2-21 - Mechanical cycling, repeated mechanical stress tests. Rate : 20 times/min. Acceptance criteria: no breakage, no blockage, play < 1 mm after test, no loss of mobility or abnormal mechanical noise.

- Earcap and earmuff wear resistance
  - Resistance to accelerated test 3000 cycles at a rate of 20 times per minute, simulating placing and removing the helmet from a user's head.

Mode of proof: IEC 60068-2-21 - Mechanical cycling, repeated mechanical stress tests. Rate : 20 times/min. No visible degradation or delamination good functioning : earcap and earmuff can not be separated, joint on earcap should not be broken

- Microphone mechanical wear resistance (if applicable)
  - Resistance to articulation fatigue (for boom or pivoting microphones) : Microphones mounted on adjustable arms (e.g., boom mics, swivel or folding systems) must withstand repeated movement and repositioning without damage or loss of functionality.

Mode of proof:

IEC 60068-2-21 – Environmental testing – Part 2-21: Repeated mechanical stress (Test U). Conditions: 10,000 adjustment cycles (opening, pivoting, or folding depending on the mic type). Test rate: 20 cycles/min. Acceptance criteria: no breakage, no abnormal play or stiffness, no loss of positioning ability or audio performance.

  - Cable or connector pull-out resistance (for detachable or wired microphones - if applicable) : Wired microphones or detachable mic modules must resist repeated connection/disconnection and accidental tugs on the cable without breakage or electrical failure.

Mode of proof:

EIA-364-09D – Electrical Connector Durability Test. Conditions: Pull test: 50 N axial force for 60 seconds applied to mic cable/connector. Insertion/extraction resistance: 5000 cycles minimum. Acceptance criteria: No visible damage, no disconnection, stable signal transmission post-test

❖ **Resistance to thermal stress**

- Resistance to high or very low outdoor temperatures for both the product itself and the product in its packaging
  - High-temperature resistance : storage for at least 48h at >= 60° and <= -30°.

    - Operating temperature for at least 4h >= 40° and <= -10°
    - After this thermal exposure, the headband is strongly bent in the opposite direction to its natural curvature three times to check that it has retained its flexibility (not become brittle or deformed) and to check that it does not break or crack under stress.
- Resistance to thermal shock and cycling: resistance to 20 cycles from -30 to 60 degrees at a minimum temperature change rate of 0.3℃/min

Mode of proof: Test report with conclusive results

- *MIL-STD-810H - Method 501.7 - Hot Base (A2) and Basic cold (C1)*
- *IEC 60068-2-2:B and IEC 60068-2-1:Ab/e*

❖ **Resistance to sealing stress and humidity**

- Resistance to dust and foreign bodies and liquids (use in the rain) : protection class IP54
- Resistance to humidity : resistance to 40℃ (60°C if inside its packaging) and 90% humidity for 72h, with the product running in normal conditions 1h afterwards

Mode of proof: Protection against ingress of particles and moisture must be indicated in the form of an IP code, corresponding to the levels defined in IEC 60529 - Degrees of protection provided by enclosures (IP code). Tests must be carried out without protective cover

❖ **Resistance to electrical stress**

- Compliance with safety and Electromagnetic Compatibility regulation standards
- Capacitors : Class B minimum (10,000 hours) or the applicant can demonstrate that the capacitors are designed for long-term operation in the conditions of use expected for the product.

Mode of proof: EC/EN 301489-1 and -17 : Electromagnetic Compatibility (EMC) standard for radio equipment and services

- The battery endurance in cycles achieves a minimum of 500 full charge with a remaining capacity of at least 80 % of the rated capacity

Mode of proof:

- *IEC 61508 (functional safety of electrical/electronic/programmable electronic)*
- *IEC 61960-3 (Li batteries for portable applications)*

- Stable Bluetooth connection

Mode of proof:

- *Bluetooth stability (smartphone-product distance/obstacles, smartphone compatibility, etc.) is analyzed and tested in accordance with the latest industry standards of Bluetooth SIG (Special Interest Group).*

- Resistance to over 150 hours of continuous listening at maximum volume

Mode of proof: Verification of no significant degradation of audio performance after 150 hours of continuous listening at maximum volume, using a before-and-after comparative method

- **Resistance to chemical stress**
  - Resistance of headphones to products likely to come into contact with them: engine oil, olive oil, hand cream, sunscreen SPF50, edible peanut oil, 75% alcohol, lipstick, liquid foundation, Artificial sweat - pH value 4.7.

Mode of proof: No damage must be visible. The paint resists, and the ink used for the inscriptions remains readable.

  - Resistance to corrosion - salt spray

Mode of proof: ISO 9227 - Corrosion tests in artificial atmospheres – Salt spray tests

- **Resistance to UV stress**
  - Resistance to UV exposure conditions likely to affect products:
    - UVA-340; Power: 0.89 W/m2/nm; Wavelength: 340nm
    - One cycle: 60℃, 8 hours of irradiation; then 50℃, 4 hours of condensation;
    - Total test 24 hours, 2 cycles

Mode of proof: IEC 60068-2-5 - Environmental testing - Part 2-5: Tests - Test S: simulated solar radiation at ground level and recommendations for solar radiation and ageing tests

Production

2. Production line

T0 Criteria

The manufacturer has the processes in place to control and maintain consistently high manufacturing and assembly quality during the production phase.

- The main site(s) involved in the production of the product is/are certified to an international quality management standard.
  - Site involved in electronic boards manufacturing ISO 9001
  - Site involved in speaker driver manufacturing ISO 9001
  - Site involved in microphone manufacturing ISO 9001 (if microphone is mounted on adjustable arm)
  - Site involved in battery manufacturing ISO 9001

Mode of proof: For companies with more than 250 employees and for subsystems identified in PSR (in the case of subcontracting), ISO9001 certification is in place, issued by an accredited 3rd party. If not, annual inspection demonstrating compliance with ISO 9001 principles by verification of quality procedures or equivalence with other certifications is needed.

3. Logistics

T0 Criteria

The manufacturer reduces risks to the reliability of components and assemblies through efficient quality processes for managing supply, packaging, storage, handling and transport conditions.

- Inventory control and management
  - The condition of products in stock and processable materials is regularly monitored, with dedicated processes to check and estimate unloading time, the date of manufacture and mode of transport (unique identifier).
  - Periodic inventories are carried out, and in the event of non-compliance, a reminder is systematically sent out. The conformity of items and materials in stock is clearly identified, and non-compliant products are placed in dedicated areas.

- Handling and transport procedures
  - Specific handling procedures are defined and controlled to avoid any deterioration of the product during delivery, handling and transport.
  - Handling, storage, packaging and preservation conditions are codified, including considerations of shelf life, sensitivity to stress, and product hazard.

- Product traceability and protection
  - Exhaustive traceability makes it possible to identify and know the history of the product, including the components and documentation associated with its life cycle.
  - Genuine conformity checks on finished products are carried out before they are put into storage, and are formally described and validated by an independent authority.

General mode of proof

4. Supply chain

T0 Criteria

Within its value chain, the producer details the performance of its quality management linked to the reliability of its suppliers' goods or services in direct relation to its manufacturing phases.

- Particular attention will be paid to the following elements:
  - Battery
  - Electronic boards
  - Speaker driver

- For companies with more than 250 employees and for subsystems identified in PSR (in the case of subcontracting), ISO 9001 certification issued by an accredited third-party inspection body.

Mode of proof: For companies with more than 250 employees and for subsystems identified in PSR (in the case of subcontracting), ISO9001 certification is in place, issued by an accredited 3rd party. If not, annual inspection demonstrating compliance with ISO 9001

principles by verification of quality procedures or equivalence with other certifications is needed.

Quality control

5. Reliability plan

T0 Criteria

The producer provides a history of product versions and identifies the changes implemented to improve product durability.

- The manufacturer is able to demonstrate the following points:
  - Identification and monitoring of failures by the technical departments of the manufacturer or its subsidiaries, with supporting statistics
  - Documented reporting of failures according to structured and systematic processes to central departments (Technical/Quality/R&D)
  - Handling and processing of reports by R&D departments, with concrete modifications made to products to constantly improve their reliability and durability.
  - Tracking of modifications made, and for major modifications involving the product's primary function : statistical measurement of their impact to attest to the effectiveness of the improvements made.

Mode of proof: demonstration of quality management to the appointed inspection body during the on-site audit.

6. Breakthrough technology

T0 Criteria

The manufacturer provides information on the share of breakthrough technology embodied in the product, and identifies the functions associated with it. He demonstrates the reliability of this technology, all the more so if it concerns a primary function. This applies to both hardware and software innovations.

General mode of proof

7. Breakdown rate

T1 Criteria

The producer tracks actual failure rates and/or indicators by product part in order to monitor product reliability at least until the last unit of the model concerned has been put on the market.

- Particular attention will be paid to failures in the following parts:
  - Battery degradation
  - User interface (e.g. buttons) not working
  - Bluetooth not connecting
  - Loose cable connector
  - Headband breakage

General mode of proof

User information

8. Product identification

T0 Criteria

The producer uses a method that allows unequivocal identification of the product and its version by interested parties in order to maximize maintenance and failure management processes.

General mode of proof

9. Completeness of usage information

T0 Criteria

The manufacturer publishes a manual detailing the product's use and care instructions, and provides the user with a maintenance plan. This information, which is also available online, must be exhaustive and relevant in order to reduce exogenous failure rates and encourage responsible use.

- The manufacturer clearly informs the user of the scenario(s) of use that will enable the energy consumption of the electrical appliance to be reduced as much as possible and explains the differences in consumption between the different modes of operation if necessary (ready for use, deep standby, complete shutdown, etc.).

- The manufacturer clearly informs the user how to properly maintain his product, providing the following information:
  - Use of suitable protection
  - Information on battery charging
  - Maintain/clean parts which touch the body

General mode of proof

10. Usage information format

T1 Criteria

The manufacturer publishes a clear, simple and accessible user and maintenance manual (font size, vocabulary, language and print quality), so that it can be easily understood by end-users.

- The service manual should be available for anyone to read, free of charge.
- Instructions on how to replace the different spare parts and specifically the battery must be available to anyone, free of charge, online for 10 years.

General mode of proof

11. Prolonged immobilization

T0 Criteria

The manufacturer identifies the risks of failure associated with prolonged product downtime. He informs the end user of the conditions of use necessary to prevent these risks.

- Applicable: Product family sensitive to non-use in the event of prolonged immobilization: risk of battery degradation.
- Consistent duration of non-use: 6 months.

General mode of proof

Repairability

Technical repairability

12. Disassembly of parts

T0 Criteria

The disassembly depth is adapted to the category of product parts and the disassembly time is consistent with the type of profile normally capable of carrying out the process.

- Class A : ≤ 3 steps and < 5 minutes
- Class B : between 3 and 6 steps and < 10 minutes
- Class C : between 6 and 10 steps and < 15 minutes
- Class D : between 10 and 15 steps and <= 20 minutes
- Class E : > 15 steps and > 20 minutes

Types of parts	Class
Product housing	B
Functional	B
Priority	B
Vulnerable	A
Consumable	A

General mode of proof

13. Part fasteners and connectors

T0 Criteria

Fasteners and connectors have removability and reusability characteristics appropriate to the category of product parts. A system is in place for locating these non-visible fasteners.

- Class A : Removable and reusable
- Class B : Removable but non reusable
- Class C : Neither removable nor reusable

Types of parts	Class
Product housing	A
Functional	B
Priority	B
Vulnerable	A
Consumable	A

- If fasteners are in class B, then the spare part must be delivered with the new fasteners needed.

- Battery fasteners are removable and reusable, or are supplied with the new battery. More generally, in the event that the fastening system cannot be reused, it must be supplied with the replacement part to enable the failure or maintenance scenario to be resolved.

General mode of proof

14. Tools

T0 Criteria

The tools required for repair and/or disassembly must be suitable for the category of product parts.

- Class A: repairs feasible without the use of tools, with tools supplied or with General-purpose tools
- Class B: repairs feasible with tools specific to the product family
- Class C: repairs feasible with other commercially available tools
- Class D: repairs feasible with proprietary tools
- Class E: repair not feasible with any existing tool

Types of parts	Class
Product housing	A
Functional	A
Priority	A
Vulnerable	A
Consumable	A

- Tolerance allowed for proprietary tools supplied or loaned on request, at no extra cost, with spare parts.

- The battery is removable. It is considered removable when it can be removed individually from the equipment, without tools or with the help of common commercially available tools, or with tools supplied free of charge with the equipment or battery.

General mode of proof

15. Working environment

T0 Criteria

Product-specific repair scenarios are carried out in a working environment adapted to the product part category.

- Class A: use environment
- Class B: workshop environment
- Class C: production environment

Types of parts	Class
Product housing	A
Functional	A
Priority	A
Vulnerable	A
Consumable	A

General mode of proof

16. Competence level

T1 Criteria

The level of technical skill required to carry out a repair is consistent with the category of parties involved.

- Class A: Novice skills
- Class B: Generalist skills
- Class C: Expert skills
- Class D: Manufacturer or approved expert
- Class E: Impossible to achieve with existing skills

Types of parts	Class
Product housing	A
Functional	B
Priority	B
Vulnerable	B
Consumable	A

❖ In particular, the battery is replaceable by end-users with novice repair skills.

General mode of proof

17. Spare parts interface

T0 Criteria

The various parts of the product and their connection interfaces are standardized to meet the repairability expectations of the product family.

- Class A: Standard part with standard interface
- Class B: Standard or proprietary part with standard interface
- Class C: Proprietary part with non-standard interface

Types of parts	Class
Product housing	B
Functional	B
Priority	B
Vulnerable	B
Consumable	B

❖ Part pairing practices are prohibited.

❖ Replacement parts need to be compatible from a technological specification perspective to function properly and it must not play a role if the part is new or reused and if it is from the original manufacturer or a 3rd party.

General mode of proof

Organizational reparability

18. Spare parts availability time

T0 Criteria

The availability time for spare parts is at least equal to the expected service life of the product category and its individual parts. The availability period is measured from the time the last unit of the model concerned is put on the market.

- Class A: Long-term accessibility - minimum 7 years
- Class B: Medium-term accessibility - between 3 and 7 years
- Class C: Accessibilité à court terme - maximum 3 years
- Class D: No information on duration of accessibility

Types of parts	Class
Product housing	A
Functional	A
Priority	A
Vulnerable	A
Consumable	A

❖ In the event that a replacement part is not available from the manufacturer or his distribution network, the manufacturer shall clearly provide the user, via the documentation made available to him, with the information and/or characteristics of the parts enabling him to use instead an adaptable or compatible replacement part available on the market for a period at least equal to that specified in the above table.

General mode of proof

19. Accessibility of spare parts to target audiences

T1 Criteria

The producer ensures the availability of spare parts for the target groups normally suited to the category of parts..

- Class A: Accessible to end users
- Class B: Accessible to independent repair service providers
- Class C: Accessible to service providers approved by the manufacturer
- Class D: Accessible only to the manufacturer

Types of parts	Class
Product housing	A
Functional	A
Priority	A
Vulnerable	A
Consumable	A

- The spare parts and the procedure for ordering them shall be publicly available on the free access website of the manufacturer, until the end of the period of availability of these spare parts.

General mode of proof

20. Terms and conditions for the sale of spare parts

T1 Criteria

The manufacturer details the terms of sale of its spare parts. They reflect the product nomenclature and are not sold as a group, unless justified by coherent and verifiable design, calibration and/or economic reasons.

- Particular attention will be paid to items in the following categories:
  - Priority parts
  - Vulnerable parts
  - Consumable parts

General mode of proof

21. Spare parts prices

T1 Criteria

The value of a spare part may not exceed a maximum percentage of the recommended selling price excluding VAT. A tolerance is allowed for parts whose PRU and pre-sales logistics costs (packaging, shipping to the sales market..) exceeds the specified percentage.

- Maximum percentage of the price of one of the parts in relation to the price of the product : 25%.

- The manufacturer studies and clearly proposes to the user, through the information medium of his choice, repair scenarios enabling repair costs to be limited to 30%, including VAT, potential shipping costs, spare part and working time of the repairer.
  These scenarios apply in the event of the failure of a single part.

General mode of proof

22. Shipping costs for spare parts

T1 Criteria

The producer delivers the spare parts at the actual cost of shipping and preparation, or offers alternative solutions that reduce the cost of receiving the parts.

General mode of proof

23. Spare parts delivery times

T1 Criteria

The manufacturer demonstrates its ability to supply spare parts to interested parties within 5 working days.

General mode of proof

24. Documentation of failure scenarios

T1 Criteria

The manufacturer makes available relevant information and instructions for resolving failure scenarios and/or implementing the maintenance plan.

These are also adapted to the product category and target audience groups. The minimum duration of information availability is specified below.

- Class A = Accessible to all without restriction
- Class B = Accessible to independent repair service providers
- Class C = Accessible to repair service providers authorised by the manufacturer
- Class D = Accessible to the manufacturer only

Documentation	Class	Documentation availability time
Disassembly diagrams, reassembly if necessary or exploded views	A	10 years
Wiring and connection diagrams	A	10 years
Circuit diagrams	C	10 years
Instructions on how to replace the battery	B	10 years
Technical manual with instructions for resolving failure scenarios	A	10 years

Documentation	Class	Documentation availability time
List of repair and test equipment required, and information on where to obtain all necessary tools for non-basic tools	A	10 years
Error and diagnostic codes (if applicable)	A	10 years
Software instructions, including reset	A	10 years
Access to incidents reported and recorded in the equipment	A	10 years
Technical bulletins	B	10 years
Instructions on how to contact customer service and specific contacts associated	A	10 years
Information on the price of spare parts	A	7 years

General mode of proof

25. Support for fault diagnosis

T0 Criteria

The producer communicates information and/or deploys diagnostic support mechanisms to help identify failure scenarios.

- Class A = Intuitive interface
- Class B = Coded interface with public reference table
- Class C = publicly accessible hardware/software interface
- Class D = Proprietary interface
- Class E = Impossible, whatever the type of interface

❖ Class A :
Diagnostic support system with intuitive or coded interface and public access to the reference table.
OR
The sales website of the product's manufacturer or distribution partners features a fault-tree diagnostic interface.

General mode of proof

Scalability

26. Reset settings and passwords

T0 Criteria

In the event of repair or transfer to a third party, the product's user data management processes enable secure, high-performance reuse.

- Class A = Integrated reset
- Class B = External reset
- Class C = Service reset
- Class D = No reset

❖ Class A : Factory settings can be restored via a built-in function.

General mode of proof

27. Software

T0 Criteria

The manufacturer ensures that the original performance of its product is maintained when updating the operating system and/or firmware, and differentiates between evolutionary and corrective updates. Users are informed of the consequences of updates, and their consent is required.

❖ The minimum availability time for updates is 7 years for products equipped with IOT functionalities.

General mode of proof

Quality of after-sales service

28. Internal failure resolution policy

T1 Criteria

In the event of product failure, the manufacturer pursues a policy of repair or reconditioning rather than replacement, unless repair is more expensive than replacement, taking into account the wishes of users.

General mode of proof

29. Service contact

T1 Criteria

The producer demonstrates that the opening of an after-sales service file does not exceed 2 working days and that the average time taken to resolve the file encourages repairs.

General mode of proof

30. Return services

T0 Criteria

The manufacturer provides end-users with return services adapted to the product category and consistent with its distribution network, regardless of the status of warranties.

- Class A = Complete return options

- Class B = Basic return options
- Class C = No return option

❖ Class B: Basic return service with minimum return conditions by post or distribution/collection point

General mode of proof

31. Return condition

T0 Criteria

The return of the original packaging cannot be demanded for the repair of the product, as long as it is packaged and protected as much as it could have been at the time of purchase.

General mode of proof

32. Useful product

T1 Criteria

In its network, and for product categories considered "highly useful", the manufacturer minimizes the repair process time until the product is returned to the end-user.

❖ Not applicable

General mode of proof

33. Warranty time

T0 Criteria

The warranty period with presumed anteriority of defect may not be less than 24 months.

General mode of proof

34. Warranty exclusions

T0 Criteria

In its general warranty conditions, the manufacturer does not introduce any abusive exclusion(s) with regard to the normal use of the product.

Examples of abusive exclusions identified:

❖ Surface micro-scratches
❖ Dust marks

General mode of proof

Lifecycle

Sustainability

By having a type 1 ecolabel certification for its product, the manufacturer automatically validates compliance with all the Life cycle category criteria.

Mode of proof: Type 1 certification to ISO 14024 from the list below

- *TCO certified*

35. Health, safety and environmental protection

T0 Criteria

With regard to human health, the safety of people and installations, and environmental protection, the manufacturer proves that it is taking action at a level that complies at least with the requirements of European directives 2011/65/EU and (EC) No 1907/2006 on the restriction of the use of certain hazardous substances in equipment, and/or action to preserve the ecosystems that are most affected.

Mode of proof: For products distributed in geographical areas potentially covered by regulatory prerogatives establishing requirements similar to the European market in terms of limiting the use of certain hazardous substances in EEE, proof of compliance with these regulatory requirements will be used as a method of proof in compliance with the RSPs of this criterion if necessary.

General mode of proof

- Excessive acoustic exposure (user safety) :
  - Maximum sound pressure level must not exceed 95 dB(A) on standard test signal, and no continuous exposure beyond 80 dB(A) RMS over 8 hours.

Mode of proof: In vivo test according to ISO 11904-2:2004.

- The final assembly manufacturer of the product is certified to an international environmental management standard.

Mode of proof: ISO 14001 certification issued by an accredited third-party inspection body.

- Life Cycle Assessment (LCA) : The characteristics of the product and the manufacturer's practices result in a minimum **class B** among the classes listed below.

Requirements	Class					
	A	B	C	D	E	F
The product's LCA is critically reviewed by a third party. The review report must include at least : - The number of years of experience in the field of LCA/PCF - Number of carbon footprints reviewed - Number of carbon footprints completed	x					
The product LCA is based on the specific product mode.	x	x				
The product LCA is based on the product's family of models, but not the specific product model			x	x	x	
The full LCA report including all assumptions is publicly available and at least partially based on real material data (Full Material Declarations)	x	x	x			

Concrete actions are taken to reduce the impact of the most impacting phase(s) of the life cycle	x	x	x	x		

Mode of proof: LCA report produced by a qualified consultancy.

- Fair mined material and/or recycled material : The characteristics of the product and the manufacturer's practices result in a minimum **class C** among the classes listed below.
  - Class A : 50% minimum of weight
  - Class B : 45% minimum of weight
  - Class C : 40% minimum of weight
  - Class D : 35% minimum of weight
  - Class E : 30% minimum of weight
  - Class F : <20% minimum of weight

With Precise recycling rates by type :

- Aluminium ≥ 90% recycled (structure/hulls)
- Plastics ≥ 50% recycled (excluding critical electronic parts)

Mode of proof: proof of origin of materials used to make the product

- The batteries comply with the limit values of EU regulation 2023/1542 .
  - If batteries contain cobalt, it must be sourced from non-conflict zones, with mandatory traceability.

Mode of proof: for product groups and geographic distribution sectors potentially covered by regulatory prerogatives establishing requirements for limiting the use of certain hazardous substances in electrical and electronic equipment, proof of compliance with these regulatory requirements will be used as evidence in meeting the SPRs of this criterion where necessary.

36. Energy and/or environmental performance

T0 Criteria

To reduce the impact of energy consumption or pollution emissions, the manufacturer demonstrates the environmental and/or energy performance of its products.
It proves that it is taking action at a level that complies, as a minimum, with the prerogatives of European directives and/or regulations :

- (EU) 2009/125/EC (including its implementing measures) on the eco-design of energy-related products
- (EU) 2017/1369 (including delegated regulations) on the energy labeling of products if the product claiming the LONGTIME® label is concerned
- ESPR - The Ecodesign for Sustainable Products Regulation (EU) 2024/1781

Mode of proof: for products distributed in geographical areas potentially covered by regulatory prerogatives establishing requirements for energy efficiency, eco-design and energy labelling similar to the European market, proof of compliance with these regulatory requirements will be used as a method of proof in compliance with the RSPs of this criterion if necessary.

General mode of proof

- The manufacturer calculates the average operating energy consumption E (W). The characteristics of the product and the manufacturer's practices result in a minimum **class A** among the classes listed below.
  - Class A : E ≤ 0.05 W
  - Class B : 0,05 < E ≤ 0,10 W
  - Class C : 0,10 < E ≤ 0,15 W
  - Class D : 0,15 < E ≤ 0,20 W

- The manufacturer calculates the standby consumption ST (W). The characteristics of the product and the manufacturer's practices result in a minimum **class B** among the classes listed below.
  - Class A : ST ≤ 5 mW
  - Class B : 5 < ST ≤ 10 mW
  - Class C : 10 < ST ≤ 15 mW
  - Class D : 15 < ST ≤ 20 mW

- The manufacturer calculates autonomy AUT (h). The characteristics of the product and the manufacturer's practices result in a minimum **class B** among the classes listed below.
  - Class A : AUT ≥ 30h
  - Class B : AUT ≥ 25h
  - Class C : AUT ≥ 20h
  - Class D : AUT ≥ 15h

Mode of proof: test method based on REGULATION (EU) 2017/1369

- Each final assembly plant manufacturing the product with an annual energy consumption exceeding 1 GWh is certified to ISO 50001.
  Or
  The company presents a greenhouse gas (GHG) emissions reduction strategy enabling a reduction of at least 35% in absolute scope 1 & 2 emissions by 2030, and deploys concrete measures focusing on energy efficiency, sobriety and the use of renewable energies.

Mode of proof:
  - *ISO 50001 certification by a third party*
  - *GHG score of 1, 2, or 3, compliant with ISO 14064 (e.g., Bilan Carbone®, GHG Protocol) less than 3 years old.*

- The manufacturer implements a modality on the central parts of the product corresponding to a **class B** to ensure compatibility over time between old and new models and/or within a similar product range.
  - Class A: More than 50% of the central parts are modular
  - Class B: More than 30% of the central parts are modular
  - Class C: Less than 30% of the central parts are modular

- Class D: None of the parts are modular

Mode of proof: study of the compatibility of spare parts sold between different models. Central parts :

- *Battery*
- *USB-C cable linking the two earphones*
- *Speakers*
- *Ear cushions*
- *Outer shells (capsules)*
- *Headband (headband)*

37. Equipment end-of-life management

T0 Criteria

As part of the management of end-of-life equipment, the manufacturer proves that it deploys actions for the collection, recovery and effective treatment of used products according to a level of requirement that complies at least with the prerogatives of European directives 2012/19/EU of July 4, 2012 on waste prevention and treatment depending on the target product group.

❖ Identification of the materials of product parts that are mainly made of plastic and weigh more than 5 grams.

Mode of proof: compliance with ISO 11469 and ISO 1043-1-2-3-4 standards.

❖ Extended Producer Responsibility (EPR) and reuse, refurbishment and/or recycling of parts and products : the characteristics of the product and the manufacturer's practices result in a minimum **class B** among the classes listed below.

Class A	For the main markets (> 10% of sales of certified product) where certified products are sold, the brand owner provides a take back scheme which demonstrably promotes and puts into practice reuse and/or refurbishment of parts and products, as opposed to recycling only, while being legally compliant with applicable EPR regulations
Class B	For all markets where certified products are sold and where EPR regulations apply, the brand owner participates in accredited EPR schemes or provides a reuse/recycling scheme which fulfills the requirements to be exempted from participation in EPR schemes. In all markets without EPR regulations, the brand owner provides voluntarily a take back possibility involving accredited reuse/recycling facilities
Class C	For all markets where certified products are sold and where EPR regulations apply, the manufacturer participates in accredited EPR schemes or operates a reuse/recycling scheme which fulfills the requirements to be exempted from participation in EPR schemes (legal compliance)

❖ The brand owner must annually prove that:

- At least 80% of all certified products sold are covered by product take-back systems.
- At least 40% of all first-tier reuse- and recycling facilities used by non-EPR take-back

systems are certified according to R2, e-Stewards, WEEELABEX, EN50625, or equivalent.

Mode of proof: In geographic distribution areas covered by regulatory prerogatives establishing product collection and recycling requirements, proof of compliance with these regulatory requirements will be used as a method of proof in compliance with the RSPs of this criterion if necessary. Use of EPR and/or reuse/recycling facilities certified to internationally accredited standards (R2, e-Stewards, EN50625 or equivalent)

38. Packaging management

T1 Criteria

As part of the fight against waste production, the manufacturer is making efforts to eliminate the proportion of non-recyclable plastic waste from its packaging through :

- At least 95% of the weight of packaging waste consists of recycled and/or recyclable and/or reusable materials
- Manual separability of non-reusable and non-valorizable packaging components weighing more than 25 grams in a single component
- Product packaging must not contain lead (Pb), cadmium (Cd), mercury (Hg) or hexavalent chromium (Cr6).
- Plastic packaging material must not contain halogens bound to organic substances

Mode of proof: Composition and characterization of packaging.

VIII. TERMS, DEFINITIONS, CLARIFICATIONS

Depending on the sector, specific definitions for different product categories (parts, functions, etc.) may be added to the recurring definitions below.

Actual failure
Failure that is effectively linked to a malfunction of the product and not to an exogenous problem (e.g. unpowered socket, incorrectly connected power cable, poorly locked lid, etc.).

Adaptable or compatible spare part
These are parts that can be adapted to several models and brands of the same product, more or less faithful copies of original parts that are not manufactured to the original manufacturer's specifications and are not sold in the original manufacturers' packaging.

After-sales service file
An After Sales Service File is a record documenting the handling of a customer request or issue following the purchase of a product. It includes all relevant information about the customer interaction, the issue reported, steps taken to resolve it, and any communication between the customer and the company. In cases where customer support teams manage the initial contact, the file may be passed on to the after-sales service team for further handling when needed, ensuring that all necessary actions are taken to resolve the issue.

The response time for handling such requests does not exceed an average of duration described in criteria 29. There may be flexibility for periods of high demand (e.g., during product launches or holidays) that are justifiable in relation to market practices.

An automated email confirming receipt of the request is not considered sufficient for compliance to criteria 29.

AMDEC / FMEA
Tools for Failure Mode and Effect Analysis / Analyse des Modes de Défaillance, de leurs Effets et de leur Criticité.

Breakthrough technology
A technology that introduces a major advance over existing solutions or practices. It is distinguished by its significant impact on performance, functionality or efficiency, and can change standards or redefine an industry. Unlike incremental improvements, a breakthrough technology often disrupts the market or the field of application, offering substantial benefits or opening up new possibilities. This can apply to both hardware and software innovations.

Circular economy part (CEP)
PIEC are second-hand goods within the meaning of art. L. 321-1 of the French Commercial Code, and cannot be universally defined, but are defined on a case-by-case, sector-by-sector basis.
For the time being, CEIPs are defined in consumer law for the following sectors: automobiles, household appliances, electronics, motorized DIY and gardening tools, sports and leisure equipment and motorized personal transport devices.

For household electrical and electronic equipment, art. R. 224-30 code de la consommation states: "For the application of article L. 224-109, parts from the circular economy are understood to be components and elements resulting from an operation of preparation with a view to their reuse" where article 541.1.1 defines "preparation with a view to reuse" as any operation of control, cleaning or repair with a view to recovery by which substances, materials or products that have become waste are prepared in such a way as to be reused without any further operation.

Competence level

Solving a failure scenario may require skills such as the ability to identify and locate the failure, access the affected area in the product, handle the appropriate tools, and manage any risks associated with the product, the environment and the operator. Depending on the level of technical skill required to carry out the repair, several levels are defined:

- **Novice:** When no specific repair experience or qualifications are required to carry out the failure scenario resolution process.

- **Generalist:** When the resolution of a scenario is not achievable by a novice, but can be achieved by a person with general knowledge of basic repair techniques and necessary safety measures

- **Expert:** When a scenario cannot be solved by a novice or generalist, but can be solved by people with specific expertise or experience related to the product group in question.

- **Manufacturer:** When the resolution of a scenario is not feasible by a novice, generalist or expert, but can be performed by the manufacturer or a person specifically trained and accredited by the manufacturer.

- **Unfeasible:** When a scenario cannot be solved by any of the defined profiles.

Compostable packaging

Container designed with materials capable of decomposing naturally under the action of micro-organisms present in the composter to become a natural or organic component of the substrate.

Corrective update :

A corrective software update is a modification or set of modifications made to a software or operating system or functionality in order to correct defects, errors or malfunctions identified after it has been put into service. These corrections aim to restore or improve the correct operation of the product or system without introducing major new functionalities. It may include corrections relating to :

- Technical errors (bugs) in software
- Design errors or user biases
- Security flaws identified after deployment

This type of update is often distinct from an evolutionary update (which adds functionality) or a preventive update (which aims to anticipate future problems).

Criticality

The criticality of a failure refers to the importance or impact of this failure on the correct operation of a product. It is assessed on the basis of the severity of the consequences the failure could have, particularly in terms of safety/costs, and the frequency of occurrence.

Data management process
Refers to the set of practices and procedures put in place by an organization to collect, store, process, protect and manage the personal information of individuals using their products.

Disassembly depth
Corresponds to the sum of the steps required to access each part individually and to separate it from the equipment, with a view to its replacement.

Electrodomestic
Product powered by electrical energy and intended for domestic use only.

EOS
An acronym for Electrical Overstress, meaning an undesirable state of electrical overload that could lead to product damage or failure.

Expected service life
Period during which the user expects the product to perform as intended.This expected lifetime is defined on the basis of scientific literature and/or consumer surveys. When the data is not available or is insufficiently robust, the expected lifetime is defined by the author of the standard, based on the expertise of the LONGTIME® teams and its network.

Experienced tools
Tools that require skill to use and whose cost can be a barrier (torque wrench, soldering iron, etc.).

External source parts
Parts external to the manufacturer's production facility, sourced from an identified supplier.

Fair Mined Material
Fair Mined Material refers to raw materials used in the device for which the manufacturer can credibly demonstrate active efforts to improve at least one of the following aspects during the extraction stage: working conditions, workers' income, or environmental protection. This means that the manufacturer is committed to ethical practices by ensuring better labor conditions, fair compensation for workers, and/or implementing measures to minimize environmental impact in the sourcing of these materials.

Full Material Declarations
Full Material Declarations (FMD) in the context of a Product Life Cycle Assessment (LCA) refer to comprehensive and detailed disclosures of all materials and substances used in a product. This includes a complete list of every material, chemical, and component that makes up the product, along with relevant information about their quantities, sources, and potential environmental or health impacts.

General-purpose tools
Common, general-purpose tools available to the general public in standard distribution and as specified in the EN 45554 tool list: screwdrivers (slotted head, cross-head, 6-lobe internal screws), wrenches (hexagon socket, combination wrenches), pliers (universal, half-round nose, diagonal cutting, multi-socket, vice, for stripping and crimping terminals), pry bar, tweezers, steel-headed hammer, universal knife (cutting pliers with retractable blade), multimeter, voltage tester, soldering iron, glue gun, magnifying glass.

High-utility product
A product that is used very frequently and which, in the event of failure, causes a significant disruption to day-to-day management: refrigerator, washing machine, boiler/water heater, telephone, computer, hob, etc.

HS
Out of order; corresponds to the end of the functional state.

IOT
Internet of Things; this function refers to the ability to connect a product to the Internet for additional remote control and/or regulation functions.

Manual
Comprehensive guide or instructional resource that provides detailed information on how to use, operate, maintain, or assemble a product, system, or process. It can take various forms, including printed booklets, digital documents (such as PDFs), illustrated tutorials, or video instructions. Its purpose is to offer clear, step-by-step guidance to users, ensuring they can correctly and efficiently engage with the product or service it accompanies.

No use
Corresponds to a state of non-operation of the device.

Non-recyclable packaging
Packaging that cannot be effectively recovered, recycled or reused after use.

Non-recoverable packaging
Refers to a type of packaging that cannot be effectively recovered, recycled or reused after use.

O.S
Operating System is a set of programs that direct the use of a computer's resources by application software.

Permanent assembly
This is an assembly of components forming a single part or component of a product, which cannot be disassembled without destroying or altering its intended use.
To remove the connection between two assemblies or parts, it is necessary to deform, degrade or destroy at least one of the parts forming the assembly. Examples: welding, crimping, clinching, stamping, gluing and adhesives.

Primary data or information
Information directly measured or collected by the professional in one or more installations representative of the professional's activities.

Product/part unit cost price (PRU)
Understood as the sum of the price of the parts making up a product/of the components of a part.

Professional tools
Tools requiring special knowledge or conditions of use, and whose acquisition cost represents an investment.

Professional user
Means any natural or legal person, to whom a product has been made available for use in the course
of their industrial or professional activities

Proprietary tool
A specific tool, not commercially available, belonging exclusively to one party or company, by virtue of which its use by another party (end user, customer, repairer) involves copyright, a license and/or a cost.

PSR
"Product Specific Requirement, corresponds to the criterion specifications applicable to the types of equipment specified within the scope of the standard.

Reconditioned part
A second-hand product or spare part, within the meaning of Article L. 321-1 of the French Commercial Code, may be qualified as a "reconditioned product" or be accompanied by the term "reconditioned", provided the following conditions are met:

- The product or spare part has undergone tests on all its functionalities in order to establish that it complies with legal safety requirements and the use to which the consumer can legitimately expect it to be put.
- If necessary, the product or spare part has undergone one or more operations to restore its functionality. This intervention includes the deletion of all data recorded or stored in connection with a previous use or a previous user, before the product or part changes ownership."

Recyclable material or product
Characteristics of a product, packaging or associated component that can be taken from the waste stream by available processes and programs, and which can be collected, processed and put back into use as raw materials or products.(based on ISO 14021).

Recycled material or product
Product or material that is manufactured entirely or partially from recovered or reused materials, diverted from the waste stream after their initial use. These materials have

undergone a transformation process, such as mechanical, chemical, or other forms of recycling, to be reintroduced into the production chain for creating new products or materials.

Recycling excludes the direct reuse of products or components without prior transformation and focuses on reducing the use of new raw materials.

Regular maintenance
Maintenance recommended by the manufacturer to keep the product in optimum working order.

Removable fastener
Corresponds to an original fastening system which can be removed during disassembly without damaging the product, but which cannot be reused during reassembly (e.g. plastic clamp, rivet).

Replacement or spare part
A replacement part is a separate part intended to replace a defective or degraded part having the same or a similar function of a good in operation; (Source: Annexes to the European Regulations laying down ecodesign requirements in accordance with Directive 2009/125/EC).

Return conditions for a repair process

- Complete returns conditions: special arrangements are in place to encourage the return of the product for a repair process, whether to the manufacturer, a partner or a repairer: free shipping, home pick-up, free replacement product during the repair process, free repair. These special arrangements are available both under warranty and out-of-warranty.
- Basic return conditions: users wishing to repair their product have the option of returning it for repair, but there are no special arrangements in place to facilitate this process (charges, etc.).
- No return solution: the end-user has no way of returning the product to the manufacturer or one of its partners for repair.

Reusable packaging
Container designed to be used over and over again, reducing the need for disposable packaging.

Reusable fastener
Corresponds to an original fastening system removed during disassembly without altering the product, and which can be reused during reassembly (e.g. screws, clips).

Reused parts
To date, there is no official definition of "re-use parts", but a definition of "re-use" provided in Article L. 541-1-1 of the French Environment Code, which defines it as follows:
Reuse: "an operation by which products or components that are not waste, are used again for a use identical to that for which they were designed".

Selling price of a spare part
Deduction of delivery costs: The principle adopted is to calculate without including transport or delivery costs. If these costs are included in the pricing of the general sales conditions, it is the responsibility of the producer or importer to deduct them for the calculation of the ratio. Specifically, for the price of spare parts, two methods are possible for deducting transport or delivery costs: individually for each part on list 2 or as a flat rate (in absolute value or as a percentage). The same applies to the price of new equipment.

Spare part(s) included in a set: If one or more parts are included in a set offered for sale or any other inseparable sub-assembly of parts, the price of the relevant part is the price of that sub-assembly.

Parts not managed by the producer or importer: If parts are not managed by the producer or importer, the price of the parts to be considered is the price listed in the supplier's general sales conditions at the time of the index calculation.

Product options with the same reference: If options are offered for the same reference and do not affect the technical characteristics, then the price ratio calculation should be based on the price of the spare parts and the price of the most common version of the product concerned.

Criterion 21 is established by calculating the ratio between: the ex-tax price of the spare part and the ex-tax price of the relevant equipment model, where each price is understood as the ex-tax price from the current price list at the time of the certification process and listed in the general sales conditions of the manufacturer or importer, or in any other relevant contractual document if not available.

If a manufacturer or importer has, for the parts or equipment concerned, several price lists depending on the different categories of distributors or sellers, the prices used for the index calculation are those from the price list that accounted for the highest share of the manufacturer’s or importer’s turnover for the type of parts or equipment concerned during the last closed fiscal year.

Serialization
Practice by which the manufacturer limits the use of spare parts to only those original parts that it approves, in particular by means of software.
Example: associating the serial numbers of a product's components with the product's overall serial number.

Spare part
A spare part is a distinct part that is an integral part of a product, essential to fulfill its primary function. It is not supposed to be replaced as part of normal use of the product, but may be replaced following accidental damage, long-term wear and tear, premature wear due to incorrect use or maintenance, or misplacement. In such cases, the spare part is exchanged for a replacement part.

Spare parts interface

Refers to the way in which parts connect or integrate with the existing components of a product. Depending on the type of part and the type of interface used to connect them, a classification is established: A standard part is a component, a part, manufactured to recognized specifications and standards, commonly used and compatible with various products or systems.

- **Standard part with standard interface:** Designates a standard part, manufactured according to recognized specifications and standards, commonly used and compatible with various products or systems, and whose connection or interaction with other components, devices or systems is based on standardized or widely used and accepted specifications.
- **Standard part with proprietary interface:** Refers to a standard part, manufactured according to recognized specifications and standards, commonly used and compatible with various products or systems, and whose connection or interaction with other components, devices or systems is based on specifications specific to a particular manufacturer or company.
- **Proprietary part with non-standard interface:** Refers to a non-standard part, exclusive to a product or company, usually produced in-house or under license. This type of part may have unique specifications that make it incompatible with other products or brands. In addition, it may be designed with a specific connection to other components, devices or systems, also based on specifications specific to a particular manufacturer or company.

Step (disassembly)
Operation leading to part removal or tool change.

Sub-assembly
A set of inseparably connected components that form a block and perform a function. The sub-assembly may be separate from the product.
Example: Soldered motor and electronic board

Usage stress
This corresponds to the forces applied to the part.

Used parts
Used goods are goods which, at any stage of production or distribution, have come into the possession of a person for his or her own use, by the effect of any act for valuable consideration or free of charge, or have undergone alterations which do not allow them to be offered for sale as new (Source: Article L321-1 of the French Commercial Code).

Waste
Any substance or object, or more generally any movable asset, which the holder discards or intends or is required to discard. (Source: Directive n°2008/98/CE of November 19, 2008 on waste)

Working environment

When solving failure scenarios, a number of different working environments can be identified.

- **Operating environment:** Corresponds to the environment in which the product is used and does not express any specific requirements relating to the working environment for the resolution of failure scenarios.
- **Workshop environment:** Corresponds to an environment which does not require a production environment (class C), but where failure resolution scenarios cannot be carried out in the operating environment.
- **Production environment:** Corresponds to an environment necessary for the resolution of failure scenarios which is comparable to that in which the product was manufactured.

IX. BIBLIOGRAPHICAL RESOURCES

This paragraph lists the main bibliographical resources used to draw up the sector reference guide, which are likely to evolve according to the target product groups.

NF EN 60335-1 COMPIL 15 Appareils électrodomestiques et analogues - Sécurité - Partie 1 : exigences générales

EN 60384-14 Condensateurs fixes utilisés dans les équipements électroniques - Partie 14 : spécification intermédiaire - Condensateurs fixes d'antiparasitage et raccordement à l'alimentation

Norme EN 45552 Méthode générale pour l'évaluation de la durabilité des produits liés à l'énergie

Norme EN 45554 Méthodes générales pour l'évaluation de la capacité de réparation, réutilisation et
amélioration des produits liés à l'énergie

DIRECTIVE 2011/65/UE relative à la limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques

Règlement (CE) no 1907/2006 concernant l'enregistrement, l'évaluation et l'autorisation des substances chimiques, ainsi que les restrictions applicables à ces substances (REACH)

DIRECTIVE 2012/19/UE relative aux déchets d'équipements électriques et électroniques (DEEE)
Règlement Délégué(UE) 2019/2015 complétant le règlement (UE) 2017/1369 en ce qui concerne l'étiquetage énergétique des sources lumineuses et abrogeant le règlement délégué (UE) no 874/2012

DIRECTIVE 2012/19/UE DU PARLEMENT EUROPÉEN ET DU CONSEIL du 4 juillet 2012 relative aux déchets d'équipements électriques et électroniques (DEEE)

https://publications.jrc.ec.europa.eu/repository/handle/JRC128672

X. VERSION UPDATE

Implemented in 2025, the LONGTIME V2 base reference system is scheduled to be valid for 5 years before its next revision in 2030, with the exception of minor changes.

Version number	Date of release	Summary of action	Editor
Référentiel Casque audio V2	05/2025	Opening of the sectoral reference framework edition	François Belin
Référentiel Casque audio V2	07/2025	Distribution of the draft	François Belin

XI. ACKNOWLEDGEMENTS

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