LONGTIME®

Certification PSR

LITHIUM-ION BATTERIES

Summary

I. INTRODUCTION

Based on the standards of the EN 45550 series and consistent with the EN 45552 and EN 45554 standards, the specific LONGTIME® standards specify elements relating to the study of the robustness, reliability and reparability of the associated product family.
All qualitative, semi-quantitative or quantitative data comes from a research and consultation process, as required by current standards, and takes into account bibliographic references (scientific studies, regulations, standards, etc.). .) and all stakeholders; namely: 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 all stakeholders able to provide assistance subject to added value and the availability of networks and information.
The definition of prerequisites in terms of quality, energy thresholds, pollutant emission thresholds, classification of parts as well as the definition of the thresholds present in the accessibility scales come from the analysis of the consultations carried out and taking into account the best eco-design practices available on the market.
The specific LONGTIME® standards are revised every 3 years at the latest.

Vision of LONGTIME®

This project is part of a dynamic of societal movement with the desire to move ahead of regulations. This label is made by citizens, for citizens. It provides certainty that the product carrying the label is manufactured for long-term use, as desired by 80% of consumers, and that it is economically repairable.

LONGTIME® is a simple, strong and effective tool, created to inform the consumer actor concerned about the overall impact of their purchases, but also the consumer wishing to acquire a product with a fair longevity/price ratio. It also tends to bring to the forefront manufacturers keen to offer products with an optimized lifespan.

Label objectives

This approach involves encouraging different consumption, therefore aiming to produce differently. Almost all citizens want a transformation of the consumer society with a real change in the technical-economic paradigm in order to consume better and more sustainably.

The ecological interest is of course major, on a global scale we have increased our consumption of raw materials in just a few decades to now exceed 60 billion tonnes per year. The label influences the preservation of planetary resources, through better use of them and the reduction of waste.

Intuitively, therefore, obtaining a good with an optimized lifespan promotes reasoned use of our planet's resources, reduces overconsumption and allows us to move away from disposable items and waste. It is not a question of looking for “immortal” products but of fighting against the too short lifespan of products.
European scientific literature confirms that, when it comes to battery life-cycle inventories, the phases upstream of the use phase, in particular the acquisition and processing of materials, are the phases with the greatest impact on life-cycle analysis.

Extending battery life is therefore seen as an effective eco-design lever, making it possible to act on the most important phase of the life cycle, resulting in efficient resource management and a reduction in negative environmental externalities.

Fields of application

The label is applicable to different product families as long as there is an assembly of parts. LONGTIME® tends to cover domestic, electronic, portable power appliances, furniture, leisure equipment, professional equipment, etc. The range of products is therefore very vast but excludes automobiles, textile products (excluding leather goods), food, cosmetics and chemicals.

Organization of the certification PSR

The criteria are broken down into several categories and the presentation of the criteria follows the following diagram:

Criteria category

The criteria are grouped into 11 main categories

Criterion number and name

Each criterion has an identification number in I.X.X format and a name allowing its theme to be defined.

Requirement level (KO/Major/Minor)

See table below

TRANSVERSE CRITERION

Criterion applicable to all product categories

- Spécification ou Product Specific Requirement (PSR)

Specific criterion whose scope is adapted to the product category of the framework.

Means of proof

Details of the means of proof required and/or relevant for the evaluation of the criterion and its PSRs

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A level of requirement is assigned to each label criterion according to the classification indicated in the table below:

KO	These criteria must be respected to qualify for labeling after the initial audit (year N).
Major	These criteria must be respected at least 80% during the audit. They will lead to the implementation of corrective actions to reach 100% by year N+1.
Minor	These criteria must be respected at least 50% during the audit. They will lead to the implementation of corrective actions to reach 80% by year N+1 and 100% by year N+2.

Control system

The assessment of compliance with the benchmark criteria is carried out by an approved and independent inspection body.
Each criterion is assessed using a compliant/non-compliant approach
More details on the control system in the labeling process available on the LONGTIME® labeling conditions online.

Standards and regulations

The standards or regulations cited in the reference system use the most recent versions and/or equivalences published in the official journal of the European Union.

II. DEFINITION OF THE PRODUCT SCOPE

A battery is an electrochemical system capable of storing electrical energy in chemical form for subsequent release as electrical energy for various electrical applications. The industry standard focuses solely on secondary batteries for portable applications. The present standard focuses solely on batteries included in product scope II.1. In the remainder of the standard, “Lithium-ion battery for portable power tools” is replaced by “battery”.

Product scope

- Remote lithium-ion battery for hand-held power tools

Outside the product scope

- Lithium-ion batteries for applications other than power tools Other battery technologies (Lead, Nickel, etc.)
- Primary batteries
- Automotive batteries
- Industrial batteries

III. NOMENCLATURE OF PARTS

List of parts representative of the target product group but not-exhaustive.

- **Cover and protection kit**
  - Handle
  - Hoods (including ventilation system or not, depending on technology)
  - Charging connector cap
  - Fixing system

- **Cell pack**
  - Cell mechanical and electrical connection components (magnets, springs, soldering…)
  - Cell matrix
  - Cells

- **HMI assembly**
  - Indicators (diode type...)
  - HMI navigation buttons
  - Lock button(s)
  - ON/OFF button
  - Display

- **Electrical and electronic assembly**
  - Electronic control module
  - Electronic display card
  - Electronic display module
  - EEPROM read-only memory
  - DC/DC converter
  - Switch, changeover switch
  - Connection layers
  - Phase terminal block
  - Electronic control board (BMS)
  - Power electronics board
  - Electronic safety card
  - Thermal fuse/circuit breaker
  - Thermal sensors & regulation
  - Thermal fuses
  - Electromechanical safety thermostat (Klixon type)
  - Sensors or contactors (positions, Hall effect sensor type safety, microswitch, etc.)
  - Power cord (to tool or mains)
  - Battery connector or socket

- **Sealing and stabilisation assembly for mechanical connections (solid, flexible)**
  - Sealing mechanism (O-ring, ring, lips, silicone)
  - Holding mechanism (screws, bolts, circlips, washers, etc.)
  - Stabilisation mechanism (spring, spacer, rings, bearing...)

IV. ACCESSIBILITY SCALE

The accessibility scale has 3 levels and aggregates data related to repairability; notably :

- The dismantling depth of the part in number of steps
- Dismantling time in minutes
- The level of skill required to complete the task
- The tools needed for the process

A	≤ 3 steps | ≤ 10 mins | any user | consumer tools
B	≤ 10 steps | ≤ 15 mins | experienced user or repairer | general public tools, experienced public tools
C	≤ 20 steps | ≤ 20 mins | experienced user or repairer | general public tools, experienced public tools, professional tools

The scales indicated in the table above are orders of magnitude not to be exceeded but these thresholds can be limited more precisely in the criteria calling for accessibility scales.

By respecting all the appropriate safety instructions, the count of the disassembly steps starts when the product is still connected to the networks.

V. ELIGIBILITY

Candidate commitment

The candidate's eligibility in a quality certification process must be consistent with their existing values and strategies.
The company has not been accused or found responsible (information/material evidence, subpoena), of ethical violation, of commercial practices clearly contrary to quality and ethics (practice of planned obsolescence, industrial espionage, fraud -tax) or major environmental impact over the last 10 years where considerable and appropriate efforts have been put in place to: repair the damage caused, prevent it from happening again, reduce their impacts.
The manufacturer has all the necessary rights over the products and is the sole holder of property rights of any kind over the products, including in particular the designs, patents and trademarks relating thereto.
The products are not subject to any dispute of any nature whatsoever from any third party.
The products are not likely to harm public order or good morals, to provoke protests from third parties, or to contravene the legal provisions in force.
For the marketing of the products, the manufacturer agrees to its obligations and strictly complies with all legal provisions (directives, regulations, standards, laws) relating to the protection of human health, safety and the protection of the environment prevailing in the geographic areas of product distribution and in relation to its product categories. For the European Economic Area, products must therefore obey European legislation and be in compliance with the “CE” marking for the products concerned.

VI. LABEL CRITERIA

Environmental performance and/or energy mandate

PR.1. Protection of health, safety and environment

Criterion Prerequisites

Within the framework of respect for human health, the safety of people, installations and protection of the environment, the producer proves that he deploys actions according to a level of requirements compliant at least with the prerogatives of the European directives 2011/65/EU and (EC) No 1907/2006 relating to the limitation of the use of certain dangerous substances in electrical and electronic equipment where necessary.

- The producer also proves its compliance with the following regulatory texts:
  - Regulation on the transport of batteries (ECE/TRANS/257)
  - European battery directive (2006/66/EC)
  - Regulation on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) chemical substances (REACH) (EC 1907/2006)

Method 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 dangerous substances in the EEA, proof of compliance with these regulatory requirements will be used. method of proof in compliance with the PSR of this criterion if necessary.

- For large companies (workforce > 5,000 people), the main site(s) involved in the production of the product have(s) a certification linked to an international environmental management standard.

Method of proof: ISO 14001 certification delivered by an accredited third-party inspection body.

PR.2. Energy and/or environmental performance

Criterion Prerequisites

As part of reducing the impacts linked to energy consumption or pollution emissions, the producer demonstrates the environmental and/or energy performance of its products.
It proves that it deploys actions according to a level of requirements consistent, at a minimum, with the prerogatives of the European (EU) directives and/or regulations 2009/125/EC (including its implementing measures) on the ecodesign of energy-related products and (EU) 2017/1369 (including delegated regulations) on energy labeling of products if the product claiming the LONGTIME® label is concerned.

- Efficient energy management
  - The manufacturer should conduct a thorough study to measure the key elements of high-performance battery energy management, including:
    - State Of Health (SOH)
    - Estimated end of life (EoL)
    - Energy efficiency
  - Optimization of the state of health (SOH) as a function of the number of cycles and external conditions, particularly temperature. After 1300 cycles, tests carried out by the manufacturer show that the remaining capacity is greater than or equal to 80%.
  - Increased resistance to external temperatures by thermal regulation system to maintain energy performance.

Method of proof: For products distributed only outside the area of the European Union establishing requirements similar to those of the European market, proof of compliance with these regulatory requirements will serve as the method of proof. Test methods described in IEC 61960-3:2017

PR.3. End of life management of equipment

Criterion Prerequisites

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

Method of proof: In geographic distribution areas covered by regulatory prerogatives establishing product collection and recycling requirements, proof of compliance with these regulatory requirements will serve as a mode of proof in compliance with the PSRs of this criterion if necessary.

Conception

I.1.1. State of the art and technical solutions

Criterion KO

The manufacturer identifies and records in a technical sheet the constraints on the use of the product and its different parts. It justifies reliable and qualitative design choices and technical solutions with regard to these constraints.

General methods of proof of the criterion: All of the following methods of proof can be used to validate the sectoral sub-criteria identified in this criterion.

Visual inspection by a third-party auditor mandated during the on-site audit supplemented by a set of data appropriate to the sub-criteria:

- *Wear and endurance tests*
- *Supplier quality data*
- *External/internal test data for qualification, performance, aging, wear, endurance, resistance to boundary conditions*
- *Any documentary evidence/software... to support compliance with the elements described in this criterion :*
  - *Internal product data sheet*
  - *Functional analysis tool*
  - *Design study (operation, materials, usage constraints) ‣ Performance test endurance*
  - *Qualifying phase and test*
  - *Failure rate study*
- *Application of product-related test standards :*
  - *IEC 61508 (functional safety of electrical/electronic/electronic systems)*
  - *IEC 61960-3:2017 (Li batteries for portable applications, test methodologies methodologies)*

❖ **General resistance to operating and environmental conditions:**

‣ Protection of internal components against external aggression (leaves, pollen, dust, water...)

- Protection of electrical or electronic components
- Dimensioning and choice of materials adapted to environmental and usage constraints (resistance to impact and perforation, good fire resistance)
- Product design and/or selection of components that are waterproof or resistant to aggressions (watertight compartment, tropicalization...)
- HMI durability: display screen, diodes and/or control buttons (depending on the model) robust and sized to withstand boundary conditions.

- Conclusive durability of ferrous, non-ferrous materials to climatic conditions particularly for casings, handles and batteries:
  - Dry heat
  - Corrosion
  - UV radiation
  - Humidity, rain

- Durability and resistance of coatings for covering and finishing ferrous materials:
  - Galvanizing
  - Cataphoresis
  - Powder coating (primer and finish)
  - Passivation
  - Zinc plating

Method of proof: Characterization of processes and coatings using technical data, wear and ageing tests.

❖ **Durability of electronic components**

- Resistance of components to environmental and operating conditions
- Thermal regulation (ventilation & cooling) and effective protection against overheating (ventilation, spacing, heat sink...) of components.
- Robustness of the electrical connection system between cells.
  - Connection system adapted to battery sizing.
  - Linking system resistant to applicable mechanical stresses (micro shocks, vibrations). Preferred magnetic connection between cells. If another technology is used (springs, welding), it will have to be justifiable by concrete elements.

Mode of proof : Characterization parts and processes by technical data, wear and aging tests.

❖ **Durability of battery cells**

- Enhanced reliability through electronic management (BMS) and cell balancing mandatory piloting of the following data by the BMS:
  - Resistance, current, internal voltage
  - Remaining capacity
  - Date of manufacture and start of service
  - Energy and capacity throughput
  - Number of loads/cycles
  - Errors and negative events during service life (overvoltage, undervoltage, overheating, long period of empty battery)
  - Cell temperature values

- Avoidance of the deep discharge phenomenon when the battery is not used. The battery must be functional despite 1 year of non-use.

- Optimization of the connection between BMS board and cell pack (link as direct and short as possible).

Method of proof: Evaluated by the appointed Inspection Body during the In-situ audit. Application of product-related test standards, e.g. IEC 61508 (functional safety of electrical/electronic/programmable electronic systems), IEC 61960-3:2017 (Li batteries for portable applications, test methodologies).

❖ **Management of exogenous failures**

- Resistance of the power cord to damage (friction, torsion) and to pull-out
- Optimized cord positioning to combat friction or pull/tear
- Use of a cord with a sheath adapted to resist friction and repeated bending
- Resistance of ports and connectors to pulling, tearing and the effects
- High number of cycles (connection/disconnection), enabling connector longevity than the product's maximum service life

- Tool protection against permanent or intermittent storage conditions
  - Design elements or product design facilitating storage

Method of proof: Evaluated by the inspection body appointed during the in-situ audit. Technical characteristics of materials, resistance and wear tests, design review.

❖ **Specific measure in favor of repair**

- Prohibited serialization practices
- Intuitive failure mode diagnostic interface if existing

Method of proof: Evaluated by the Inspection Body commissioned during the In-situ audit for equipment such as repair assistance software, diagnostic interfaces... Documentary audit for all repair-facilitating documents and related declarations.

I.1.2. Production

Major criterion

The manufacturer has processes enabling it to control and maintain constant quality of manufacturing and assembly in production.

Method of proof: ISO 9001 certification or equivalent certification. For companies with more than 250 employees, ISO 9001 certification is delivered by an accredited third-party inspection body. Demonstration of compliance with the principles of ISO 9001 by verification of quality procedures or by equivalence in other certifications.

I.1.3. Consumable parts and accessories

Major criterion

Consumable parts, accessories and parts requiring regular maintenance comply with accessibility scale A.

❖ Accessibility scale limited to 5 steps and 10 minutes

- Not identified according to the LONGTIME® standard definition

Method of proof: Visual inspection and real-time demonstration to the inspection body mandated during the on-site audit.

I.1.4. Security elements

Criterion KO

The replacement and/or rearming of product and/or user safety elements is provided by the manufacturer. These elements respect accessibility scale B.
These are all the active and passive parts necessary to protect against risks associated with the use of the product.

- Accessibility scale limited to 5 steps and 10 minutes

  - Electrical and electronic assembly :
    - Protection PCB
    - Thermal fuse/circuit breaker
    - Thermal sensors & regulation
    - Thermal fuses
    - Electromechanical safety thermostat (Klixon type)
    - Sensors or contactors (positions, Hall effect sensor type safety,microswitch...)

Method of proof: Visual inspection and real-time demonstration to the inspection body mandated during the on-site audit.

I.1.5. Vulnerable parts

Criterion KO

Vulnerable parts include parts exposed to a high rate of accidental user breakage. The replacement of these parts complies with accessibility scale B.

- Accessibility scale limited to 10 steps and 15 minutes

  - Electrical and electronic assembly :
    - Power cord (to tool or mains)
    - Battery connector or socket

  - HMI assembly
    - HMI navigation buttons ‣ Lock button(s)
    - ON/OFF button
    - Lock button(s)
    - Display

Method of proof: Visual inspection and real-time demonstration to the inspection body mandated during the on-site audit.

I.1.6. Non usage

Minor criterion

The manufacturer identifies the consequences of non-use of the product and must inform the consumer in the recommendations for use of the minimum use necessary for the proper functioning of the product.

- Applicable: Risk of deep discharge.
  Consistent duration of non-use: 1 year

I.1.7. Unproven technology

Criterion KO

The manufacturer provides information on the unproven technology in its product. It must provide the means implemented to guarantee its reliability or ensure that the normal use of the product does not depend on this technology.

Method of proof: Real-time demonstration to the inspection body mandated during the on-site audit.

I.1.8. External source parts

Minor criterion

The manufacturer records external source parts purchased and/or subprocessed. It must provide information relating to their origin and quality.

Method of proof: Supplier certification and demonstration of quality management to the inspection body mandated during the on-site audit or 10-year manufacturer quality commitment.

I.1.9. Reliability plan

Minor criterion

The manufacturer provides its own FMEA, FMEA or internal audit and identifies the changes implemented to improve the reliability and/or repairability of the product. Corrections or improvements already made to the product are indicated.

I.1.10. sub-assembly

Major criterion

The product design must only use subassemblies on technical justification or proof of reliability.
Without technical justification, the subassemblies must be subject to a standard reconditioning and/or exchange route where the manufacturer demonstrates the economic interest for the user.

Scalability

I.2.1. Software

Major criterion

The manufacturer ensures that the original performance of its product is maintained during OS updates. without a time limit. The manufacturer identifies and records the means it uses to monitor the maintenance of these post-upgrade performances.

- Corrective and evolutionary updates must be dissociated
- Availability of security updates 7 years minimum
- Availability of operating system evolutionary updates 6 years minimum

Traceability

I.3.1. Study and failure rate

Minor criterion

The manufacturer provides breakdown rates and/or indicators enabling the reliability of the product to be monitored at least until the last unit of the model concerned is placed on the market.

- Particular attention will be paid to the following failures:

  - Electronic board failure : Electronic board HS : broken component type MOS, Capa, Self, ... (due to overcurrent, overheating…), Fuse/switch H.S
    - Element (cell) or row H.S.
    - Dendrite (electrochemical perforation of cell layers)
  - Charge port alteration (failure or breakage)
  - Water ingress into the pack
  - Broken plastic shells from drops or misuse
  - Faulty back fastening system

I.3.2. Identification number

Minor criterion

The manufacturer uses an identification number or method on each product.

Method of proof: In geographic distribution areas covered by regulatory pre-rotations establishing identification requirements, proof of compliance with these regulatory requirements will serve as a mode of proof in compliance with the PSRs of this criterion if necessary.

Disassembly

II.1.1. Product packaging

Criterion KO

Brings together all the product's covering parts (cover type) to protect the internal components from the outside.
The body of the product is removable and allows access to internal elements while respecting accessibility scale B. Permanent assemblies are prohibited unless the nature or use of the product justifies it.

- Accessibility scale limited to 5 steps and 10 minutes
  - **Cover and protection assembly**
    - Handle
    - Hoods (including ventilation system or not depending on technology)
    - Charging connector cap
    - Fixing system

- Non-justifiable, unauthorized permanent assembly.
- In case of assembly by clips, verification of the quality of the clips and the availability of location information.

Method of proof: Visual inspection and real-time demonstration to the inspection body mandated during the on-site audit.

II.1.2. Access to functional parts

Major criterion

Parts related to the operation or use of the product.
Access to functional parts cannot exceed accessibility scale C.

- Accessibility scale limited to 5 steps and 10 minutes

  - **Ensemble pack cellules**
    - Cell mechanical and electrical connection components (magnets, springs, soldering depending on the technology used)
    - Cell matrix
  - **Cladding and protection assembly**
    - Handle
  - **HMI assembly**
    - Indicators (diode type...)
  - **Electrical and electronic assembly**
    - Power electronics board
    - Electronic control module
    - Electronic display card
    - Display electronics module
    - EEPROM read-only memory

- DC/DC converter
- Switches
- Connection cables
- Phase terminal block

- **Sealing assembly and mechanical link stabilizations (solid, flexible)**
  - Holding mechanism (screws, bolts, circlips, washers...)
  - Stabilizing mechanism (spring, spacer, rings, bearing...)
  - Sealing mechanism (O-ring, ring, lips, silicone)

Method of proof: Visual inspection and real-time demonstration to the inspection body mandated during the on-site audit.

II.1.3. Access to priority parts

Major criterion

Functional parts but characterized by proven criticality in the event of a malfunction or breakdown (sometimes called critical parts).
Access to priority rooms complies with accessibility scale B or has been the subject of a reliability plan.

❖ Accessibility scale limited to 5 steps and 10 minutes

- **Cell pack**
  - Cells
- **Electrical and electronic assembly**
  - Electronic control board (BMS)

Method of proof: Visual inspection and real-time demonstration to the inspection body mandated during the on-site audit.

II.1.4. Sub-assembly connectors (internal parts)

Major criterion

The connectors of the replacement subassemblies must not interfere with the repair of the product.

❖ All connector fixing elements must be at least removable (class B standard EN 45554).

Method of proof: Visual inspection and real-time demonstration to the inspection body mandated during the on-site audit.

II.1.5. Batteries

Criterion KO

The manufacturer provides a solution for replacing the batteries of autonomously operating devices.

❖ Not applicable

II.1.6. Disassembly tools

Major criterion

Disassembly of the product does not require a proprietary tool, apart from regulatory justification.

- No regulatory justification identified
- List of tools in accordance with the list in table A2 of standard EN 45554 and supplemented with basic tools specific to the target product group
  - Joint extractor
- Tolerance allowed for proprietary tools provided on request at no cost additional with the spare part.

Method of proof: Visual inspection and real-time demonstration to the inspection body mandated during the on-site audit.

Documentation

II.2.1. Exploded diagram

Major criterion

The manufacturer makes available to users, directly or indirectly via its partners or its network, diagram(s) or exploded view(s) of the product as well as a nomenclature of the parts and subassemblies of the product.

II.2.2. Exploded diagram

Minor criterion

The manufacturer references and delivers more specific exploded views to help identify and name a part.

II.2.3. Fault code

Major criterion

User and repairer fault codes must be present in the respective documentation and/or accessible on the manufacturer's website.

II.2.4. Repair Manual

Minor criterion

The manufacturer makes the information necessary for repairing the product accessible to repairers OR must justify economically viable alternatives for the end user.

- All documents necessary for resolving failure scenarios must be exhaustive and accessible (Class A Table A.10 of standard EN 45554) for all professionals in the sector and as a priority:
    - A disassembly diagram or exploded view
    - A technical instruction manual for resolving failure scenarios
    - A list of necessary repair and testing equipment
    - Component and diagnostic information (such as theoretical minimum and maximum values for measurements)
    - Wiring and connection diagrams
    - Error and diagnostic codes (including manufacturer-specific codes, if applicable)
    - Instructions for installing relevant software and firmware, including reset software
    - Information on how to access data relating to failure incidents if they are recorded in the product

Method of proof: Visual inspection and real-time demonstration to the mandated inspection body during the documentary audit or on-site audit.

II.2.5. Troubleshooting software packages

Minor criterion

The fault diagnosis software packages must be free of rights after the full warranty period with regard to the end date of manufacture of the product.

Spare parts

II.3.1. Nomenclature

Major criterion

All spare parts or subassemblies are uniquely named and coded to facilitate identification and ordering of parts.

II.3.2. Availability time

Criterion KO

The manufacturer commits in its General Terms and Conditions or via commercial communication to the availability of spare parts or replacement parts for the product for a minimum of 5 to 10 years from the placing on the market of the last unit of the model concerned. The minimum availability time required is determined in the sectoral appendix.

- Availability of spare parts 10 years minimum (Class A - Long-term accessibility; Table A9 according to standard EN 45554)

Method of proof: Mode of proof: Demonstration to the mandated inspection body during the documentary audit or on-site audit (general conditions of sale).

II.3.3. Supply time

Minor criterion

For functional parts or sub-assembly, the manufacturer has a minimum reserve to meet the probability of demand for said part OR justification for a procurement process within identical deadlines.

II.3.4. Price of spare parts

Major criterion

The terms and conditions for purchasing spare parts are detailed (average price, distribution network, etc.). The manufacturer makes every effort to limit the total price of functional parts to the maximum recommended selling price excluding tax of the product.
The value of one of these functional parts cannot exceed the set percentage of the maximum recommended selling price excluding tax of the product.

- Percentage set at 25%. A tolerance is allowed for parts whose PRU would exceed 25%.
- All replacement parts must be accessible.

Method of proof: Visual inspection and real-time demonstration to the mandated inspection body during the documentary audit or on-site audit.

II.3.5. Price of delivery costs

Minor criterion

The manufacturer delivers the spare parts at actual shipping and preparation costs or offers alternative solutions reducing the cost of receiving the spare parts.

After-sales service under warranty

II.4.1. Contact du SAV

Minor criterion

The maximum time for opening an after-sales service file must not exceed 2 working days.

II.4.2. Support

Major criterion

The manufacturer provides the end user with an after-sales service network in line with its direct distribution network.

II.4.3. Repair policy

Major criterion

Repair must take precedence over replacement.

Out-of-warranty after-sales service

II.5.1. After-sales service network

Minor criterion

The user is provided with the means to facilitate the repair of his product outside of warranty. To support the product to be repaired, the manufacturer must provide the user with the benefit of its distribution and repair network.

Free long-term warranty

III.1.1. Warranty time

Criterion KO

The warranty period with presumption of prior history of the defect is determined in the sectoral annex. This time cannot be less than 24 months.

- 24 months minimum

Method of proof: Demonstration to the mandated inspection body during the documentary audit or on-site audit (general conditions of sale).

III.1.2. Warranty conditions (beyond the legal conformity period)

Major criterion

For product categories considered to be “highly useful”, the manufacturer provides for the provision of a replacement item to the user during the period of downtime of the product for repair.

- Considered a very useful product

III.1.3. Disclaimer of warranty

Major criterion

The warranty exclusions must not be excessive with regard to the normal conditions of use of the product. They will be defined in the sectoral annex.

- No abusive warranty exclusions identified

Method of proof: Demonstration to the mandated inspection body during the documentary audit or on-site audit (general conditions of sale).

III.1.4. Assignment of Warranty

Major criterion

The manufacturer sets up a transferable guarantee system.

III.1.5. Original package

Minor criterion

Return of the original packaging cannot be required for warranty coverage.

Use and care instructions

III.2.1. Usage information provided

Major criterion

The manufacturer delivers with the product a notice with advice on use and maintenance of the product. This information must be exhaustive and relevant in order to reduce the exogenous failure rate.

- The manufacturer clearly makes the user aware, via the instructions and/or its website, of responsible use of the device.
  - Maintenance with particular emphasis on the concept and importance of descaling
  - Use
  - Valorization of consumables
  - Repair

Method of proof: Visual inspection and real-time demonstration to the mandated inspection body during the documentary audit or on-site audit (physical and/or digital instructions for use).

III.2.2. Usage information provided

Major criterion

The use and maintenance advice booklet is clear, simple and accessible (adapted font size, vocabulary, language and print quality), so as to be easily understandable by end users.

III.2.3. Access to information

Minor criterion

Information relating to the use and maintenance of the property must be available in digital version on simple request or freely accessible on the manufacturer's website.

VII. TERMS AND DEFINITIONS

Depending on sectoral standards, definitions specific to different product categories (parts, functions, etc.) can be added to the recurring definitions below.

Actual failure
Failure which is actually linked to a malfunction of the product and not to an exogenous problem. (e.g. power outlet not powered, power cable not properly connected, lid not properly locked, etc.)

AMDEC / FMEA
Tools allowing the Analysis of Failure Modes, their Effects and their Criticality / Failure Mode and Effect Analysis.

BMS card
Battery Management System. Electronic system incorporating an electronic board for managing battery status and ensuring safe operation.

Capacity (Ah)
Capacity indicates the amount of energy that a battery, accumulator or cell can store. It is measured in Ampere-hours (Ah).

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

Compostable packaging
Container designed with materials capable of decomposing naturally under the action of microorganisms present in the composter to become a natural or organic element of the substrate.

Constraint of use
It corresponds to the forces which apply to the part.

Criticality
The criticality of a failure refers to the importance or impact of this failure on the proper functioning of a product. It is evaluated according to the severity of the consequences that the failure could cause, particularly in terms of safety/costs, and the frequency of occurrence.

Data management process
Refers to all the 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 allowing individual access to each part and detaching it from the equipment, with a view to its replacement.

Disruptive technology
Technology whose operation brings an innovation or a major technological advance compared to previous ones and whose reliability has not yet been fully proven over time.

EOS
Acronym for Electrical Overstress reflecting a state of undesirable electrical overload likely to lead to damage or failure of the product.

“Experienced Audience” tools
Tools requiring skills to use and whose cost can represent a barrier (torque wrench, soldering iron, etc.).

Expected lifespan
Period during which the user expects their product to perform as intended.

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

“General public” tools
Common tools, for general use, available to the general public in traditional distribution and as specified in the EN 45554 standard tools list: screwdriver (slotted head screw, cruciform, 6 internal lobes, wrench (hexagon socket screw, mixed), pliers (universal, half-round nose, diagonal cutting, power strip, vice, for stripping and crimping terminals), pry bar, tweezers, hammer with steel head, utility knife (cutting pliers with retractable blade), multimeter, voltage tester , soldering iron, glue gun, magnifying glass.

“Great utility” product
A very frequently used product which, in the event of a breakdown, causes a significant disruption in day-to-day management: refrigerator, washing machine, boiler/water heater, telephone, computer, hob, etc.

HS
Out of service ; corresponds to exiting the functional state.

IOT
Internet of Things or internet of objects; This function corresponds to the fact of being able to connect your product to the internet in order to obtain additional remote control and/or regulation functionalities.

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

Non usage
It corresponds to a non-operating state of the device.

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

Permanent assembly
It is a set of components forming a single piece or part of a product and cannot be dismantled without destruction or alteration of the use for which it is intended.
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, bonding and adhesives.

“Professional” tools
Tools requiring specific knowledge or conditions of use and whose acquisition cost represents an investment.

Proprietary tool
Specific tool, not commercially available, belonging exclusively to a party or a company, and by virtue of which, its use by another party (end user, customer, repairer) implies 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 framework.

Reusable packaging
Container designed to be used multiple times, reducing the need for disposable packaging.

Regular maintenance
Maintenance recommended by the manufacturer to keep the product in optimal operating condition.

Reusable attachment
Corresponds to an original fixing system removed during disassembly without altering the product and which is reusable during reassembly (e.g. screws, clips).

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

Seasonal energy efficiency for space heating
The ratio (Ns), expressed as a %, between the space heating demand for a designated heating season, covered by a heating device, and the annual energy consumption required to meet this demand.

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

Spare parts interface
Refers to how parts connect or integrate with 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 according to recognized specifications and standards, commonly used and compatible with various products or systems.

Serialization
Practice by which the producer limits the use of spare parts to only original parts that he approves, in particular by software means.
Example: associate the serial numbers of the components of a product with the overall serial number of the product.

Subset
Set of connected components inseparable from each other which form a block and provide a function. The subassembly can be separated from the product.
Example: Motor and welded electronic card

Unit cost price "PRU" of a product/part
Understood as the sum of the price of the parts making up a product/components of a part.

Working environment
When resolving failure scenarios, several working environments may be listed.

VIII. THANKS

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IEC 61960-3:2017 (Li batteries for portable applications, test methods)

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