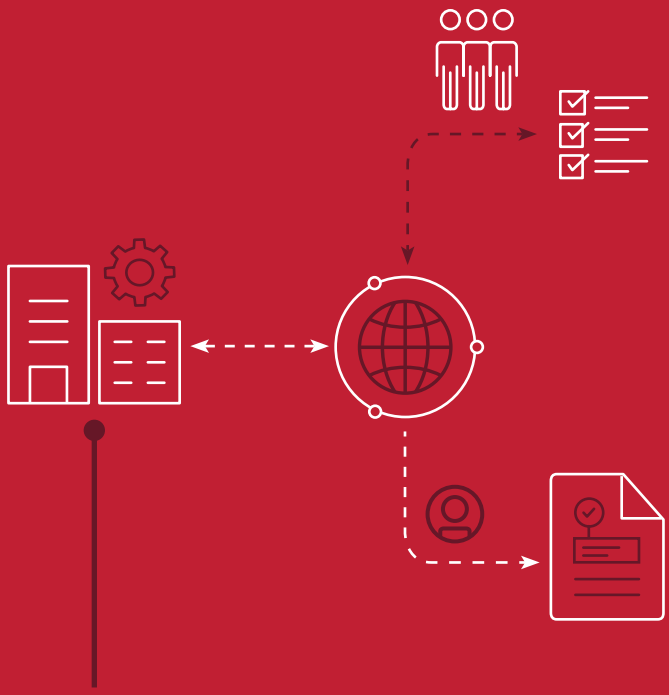


Technical documentation guide

Empowering Trust™

Table of Contents

1. Introduction

UL is a well-established company in the assessment and certification of medical devices and medical device manufacturers. Drawing upon this experience, we have developed the following guide to support an efficient review process for the technical documentation supplied by manufacturers in regulatory submissions for CE-marking.

The content of the technical documentation supplied by the manufacturer plays a vital role in the approval of the medical device in question. This guide provides further information on the type of information expected to be supplied for review.

Additionally, consideration of interlinked factors can facilitate a predictable and speedy review by the certification body, thereby reducing certification cost and increasing the speed to market:

Arranging your submission in advance
Use inform.regulatory@UL.com and our change request form to notify us of your planned submissions. We will get in contact with any questions and the associated quote.

Format
Documentation should be supplied electronically, searchable and bookmarked, ideally in a single PDF with Optical Character Recognition (OCR) applied to all pages.

Introduction
Supply the reviewer with an introduction to the file as a whole and areas of changes, where the review covers changes to already certified products.

2. Technical documentation content

Technical documentations can exist in different formats and a number of different guidance documents are available to aid manufacturers to optimize this structure (International Medical Device Regulators Forum (IMDRF): http://www.imdrf.org/documents/documents.asp). A well laid out index file does not have to follow the structure mentioned here, but would significantly aid the review process. The sections below detail the information that is required to be supplied for review.

It should also be noted that the technical documentation is expected to be provided in English with all documents signed as required by the manufacturer's quality management system. Documents may be digitally signed or scanned and a version of the signature page can be inserted into the electronic document.

2.1 Device description and specification, including variants and accessories

- Product or trade name and a general description of the device including its intended purpose and intended users
- The intended patient population and medical conditions to be diagnosed, treated and/or monitored and other considerations such as patient selection criteria, indications, contraindications or warnings
- Principles of operation of the device and its mode of action, scientifically demonstrated if necessary
- The rationale for the qualification of the product as a medical device
- The risk class of the device and the justification for the classification rule(s) applied
  (Guidance: Classification of Medical Devices - MEDDEV 2.4/1 - https://ec.europa.eu/docsroom/documents/10337/attachments/1/translations)
- An explanation of any novel features
- A description of the accessories for a device, other devices and other products that are not devices, which are intended to be used in combination with it (Note: It is important to classify accessories in their own right. Depending on their classification, a separate route to conformity may apply and an additional review may be required. Devices and accessories intended to be used in combination with other devices, must contain documentation to demonstrate the mutual compatibility of all devices involved.)
- A description or complete list of the various configurations/variants of the device that are intended to be made available on the market
- A general description of the key functional elements, e.g. its parts/components (including software if appropriate), its formulation, its composition, its functionality and, where relevant, its qualitative and quantitative composition. Where appropriate, this shall include labelled pictorial representations (e.g. diagrams, photographs, and drawings), clearly indicating key parts/components, including sufficient explanation to understand the drawings and diagrams

- A description of the raw materials incorporated into key functional elements and those making either direct contact with the human body or indirect contact with the body, e.g., during extracorporeal circulation of body fluids
- Technical specifications, such as features, dimensions and performance attributes. This includes any variants, configurations or accessories that would typically appear in the product specifications, brochures, catalogs or similar publications
- Reference to previous and similar generations of the device:
  - An overview of the previous generation or generations of the device produced by the manufacturer, where such devices exist
  - An overview of identified similar devices available on the EU or international markets, where such devices exist

2.2 Information to be supplied by the manufacturer

A complete set of:

- Labels on the device and on its packaging such as single unit packaging, sales packaging, transport packaging in case of specific management conditions, in the languages accepted in the Member States where the device is envisaged to be sold
- Instructions for use in the languages accepted in the Member States where the device is envisaged to be sold
- The Declaration of Conformity for the device, or a draft declaration of conformity for products not yet placed on the market

2.3 Design and manufacturing information

- Key device materials/components — BOM (bill of materials)
- Information to allow the design stages applied to the device to be understood (process flow chart, assembly instruction)
- Complete information and specifications, including the key manufacturing processes and their validation, their adjuvants, the continuous monitoring and the final product testing. Data must be fully included in the technical documentation.
- Identification of all sites, including suppliers and subcontractors, where design and manufacturing activities are performed (provide their valid ISO 13485 certificate if available)
  (Note: Subcontractors involved in key stages of the manufacturing process must hold a valid ISO 13485 certificate with an appropriate scope for the activities they are carrying out. In lieu appropriate of certification, a subcontractor audit may have to be carried out by the notified body. Significant subcontractors may also be subject to unannounced audits by their notified body and the legal manufacturer must have a process to control the output of its subcontractors and the associated audits carried out by their notified body.)

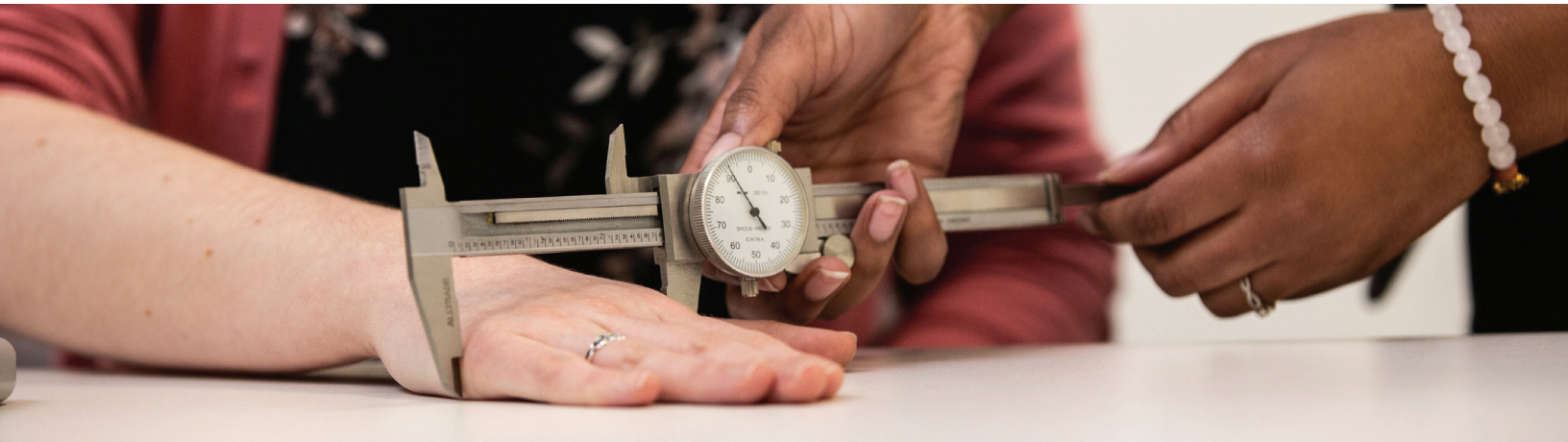
2.4 General safety and performance requirements

The technical documentation must contain information that demonstrates conformity with the general safety and performance requirements (also referred to as essential requirements) that are applicable to the device in question. This must take in to account its intended purpose, and must also include a justification, validation and verification of the solutions adopted to meet those applicable requirements. The demonstration of conformity should include:

- General safety and performance requirements that apply to the device and an explanation as to why others do not apply
- Method or methods used to demonstrate conformity with each applicable general safety and performance requirement
- Harmonized standards (rationale is required for using a non-harmonized standards), common specifications (CS) or other solutions applied
- Precise identity of the controlled documents offering evidence of conformity with each harmonized standard, CS or other method applied to demonstrate conformity with the general safety and performance requirements. The information referred to under this point should incorporate a cross-reference to the location of such evidence within the full technical documentation and, if applicable, the summary technical documentation
- List or reference to standards used and whether full or partial compliance claimed

2.5 Benefit-risk analysis and risk management

The documentation shall contain information on the benefit-risk analysis and the solutions adopted and the results of the risk management, as defined by the applicable international standard for risk management. The assessment should be conducted for the life-cycle of the device, from the intial design to its disposal, and continually updated as a result of experienced gained. The documentation must allow the assessment of the controls applied to all risk and that the benefits outweigh all residual risks. Overall, the analysis has to demonstrate the reduction of all risk as far as possible.

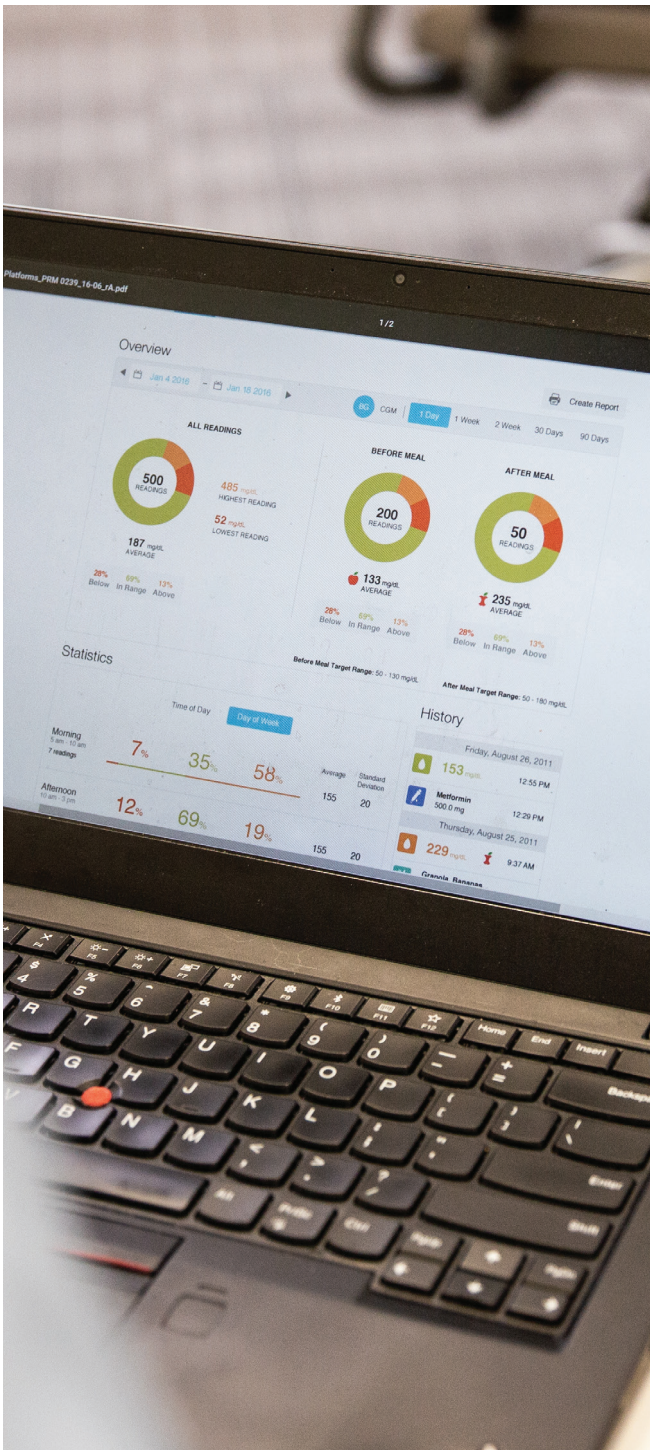


2.6 Preclinical, clinical and postmarket surveillance data

The product verification and validation documentation must contain the results and critical analyses of all verifications and validation tests and/or studies undertaken to demonstrate conformity of the device with the applicable regulatory requirements and in particular the applicable general safety and performance requirements. These include:

- Results of tests (safety and performance test data and reports), such as engineering, laboratory, simulated use and animal tests, and evaluation of published literature applicable to the device, taking into account its intended purpose, or to similar devices, regarding the pre-clinical safety of the device and its conformity with the specifications;
- Detailed information regarding test design, complete test or study protocols, methods of data analysis, in addition to data summaries and test conclusions regarding in particular:
  - Biocompatibility of the device including the identification of all materials in direct or indirect contact with the patient or user
  - Physical, chemical and microbiological characterization
  - Electrical safety and electromagnetic compatibility
  - Software verification and validation as used in the finished device. This information should typically include the summary results of all verification, validation and testing performed both in-house and in a simulated or actual user environment prior to final release. It should also address all of the different hardware configurations and, where applicable, operating systems identified in the information supplied by the manufacturer.
  - Software classification and justification for the classification class
  - Software risk assessment documentation (e.g. software hazard analysis, software failure mode and effects analysis, fault tree analysis, traceability)
  - Stability, including shelf life and transport validation (Note: Where accelerated shelf life testing is provided, the documentation must also include a detailed plan to generate real time shelf life data or a rationale to demonstrate why its characteristics are not expected to degrade over the claimed life time. Life time and shelf life are not the same, where lifetime is a combination of shelf life and service life.)
  - Performance and safety

Where applicable, conformity with the provisions of Directive 2004/10/EC of the European Parliament and of the Council must be demonstrated.



Where no new testing has been undertaken, the documentation shall incorporate a rationale for that decision. An example of such a rationale would be that biocompatibility testing on identical materials was conducted when those materials were incorporated in a previous version of the device that has been legally placed on the market or put into service.

Confirmation of conformity with relevant general safety and performance requirements under the normal conditions of the intended use of the device, and the evaluation of the undesirable side-effects and of the acceptability of the benefit-risk ratio must be based on clinical data. The clinical data presented must show sufficient clinical evidence, which should be appropriate in view of the characteristics of the device and its intended purpose. The clinical evaluation, its results and the clinical evidence derived from it shall be documented in a clinical evaluation report.

The following are required as evidence to support the clinical evaluation and post-market surveillance:

- Clinical evaluation report and its updates and the clinical evaluation plan.
    - The clinical evaluation of the data presented shall follow a defined and methodologically sound procedure based on a critical evaluation of the data obtained from clinical investigation or, a critical evaluation of the relevant scientific literature. The evaluation shall be related to the subject device or on an equivalent device (equivalence to the subject device must be demonstrated).
    - Where applicable, the critical evaluation of the clinical data must include data obtained from any post-market surveillance clinical follow-up activities on the subject device.
    - Where a clinical investigation has not been performed, then a justification must be provided.

  (Guidance: Clinical evaluation: A Guide for manufacturers and Notified Bodies - MEDDEV 2.7.1- https://ec.europa.eu/docsroom/documents/17522/attachments/1/translations/en/renditions/native)
- Post Market Clinical Follow-Up (PMCF) and PMCF evaluation report, specific to the device or group of devices, or a justification why a PMCF is not applicable. (Guidance: Post market clinical follow-up studies – MEDDEV 2.12/2 - https://ec.europa.eu/docsroom/documents/10334/attachments/1/translations)
- Post-market surveillance plan must address the collection and utilization of available information, in particular:
    - Information concerning serious incidents and field safety corrective actions
    - Records referring to non-serious incidents and data on any undesirable side-effects
    - Information from trend reporting
    - Relevant specialist or technical literature, databases and/or registers
    - Information, including feedbacks and complaints, provided by users, distributors and importers
    - Publicly available information about similar medical devices
- The post-market surveillance plan must cover at least:
    - Proactive and systematic process to collect any information referred to in point (a). The process must allow a correct characterization of the performance of the devices and must also allow a comparison to be made between the device and similar products available on the market
    - Effective and appropriate methods and processes to assess the collected data
    - Suitable indicators and threshold values that must be used in the continuous reassessment of the benefit- risk analysis and of the risk management
    - Effective and appropriate methods and tools to investigate complaints and analyze market-related experience collected in the field
    - Methods and protocols to manage the events subject to the trend report, including the methods and protocols to be used to establish any statistically significant increase in the frequency or severity of incidents as well as the observation period
    - Methods and protocols to communicate effectively with competent authorities, Notified Bodies, economic operators and users
    - Systematic procedures to identify and initiate appropriate measures including corrective actions
    - Effective tools to trace and identify devices for which corrective actions might be necessary
    - PMCF plan or a justification as to why a PMCF is not applicable

2.7 Additional information required in specific cases

- Where a device incorporates, as an integral part, a substance which, if used separately, may be considered to be a medicinal product within the meaning of point 2 of Article 1 of Directive 2001/83/EC, including a medicinal product derived from human blood or human plasma, a statement indicating this fact. In this case, the documentation must identify the source of that substance and contain the data of the tests conducted to assess its safety, quality and usefulness, taking account of the intended purpose of the device.
- The documentation must identify all materials of human or animal origin used and provide detailed information concerning the conformity.
- In the case of devices placed on the market in a sterile or defined microbiological condition, a description of the environmental conditions and controls for the relevant manufacturing steps. In the case of devices placed on the market in a sterile condition, a description of the methods used, including the validation reports, with respect to packaging, sterilization and maintenance of sterility (including packaging integrity for duration of claimed shelf life and transportation). The validation report shall address bio burden testing, pyrogen testing and, if applicable, testing for sterilant residues.
- In the case of devices placed on the market with a measuring function, a description of the methods used in order to help provide the accuracy as given in the specifications.
- In the case of devices placed on the market intended for re-use or with intention of being sterilized or subject to high level disinfection before use ; the instructions for cleaning, disinfection/sterilization of the device , and the validation reports for the processes described.

UL.com/healthcare

BNG-080619