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IVDR Documentation Submission

Best Practice Guidelines

Contents

Introduction

Prior to placing a device on the market, manufacturers shall undertake an assessment of the conformity of that device, in accordance with the applicable conformity assessment procedures set out in Annexe IX to XI of (EU) 2017/746, hereafter referred to as the In Vitro Diagnostic Regulation (IVDR). Subject to classification, most devices will need their Technical Documentation assessed by a Notified Body.

The Technical Documentation submission guidance is aligned to the requirements of the IVDR, described in detail in Annex II and III.

Notified Body BSI Group The Netherlands B.V. (2797) and IVD manufacturers both have an interest in speeding up the review of Technical Documentation and reducing the time to certificate decision.

The most common reasons for delays in technical documentation reviews are:

- **Incomplete Submissions**
  BSI has not been provided with all the information needed for the review.

- **Poor structuring of Technical Documentation**
  The information is present within the technical documentation but is difficult to locate.

To reduce the frequency of the above issues, BSI Medical Devices proposes the present Best Practice Guidelines for IVDR Documentation Submission.

Get in touch

Whether you are starting the certification process, looking to transfer or need to discuss your options, we can guide you through the process.

Request a quote

Submission and Technical Documentation content

Requirements for any technical documentation review:

- Context (i.e., an explanation of what is being requested and why).

- The Technical Documentation (i.e., objective evidence to demonstrate compliance).

- Authorisation for BSI to carry out the work.

The submission should therefore contain:

1 Cover letter

The cover letter should contain an executive summary containing at least the following details.

- Certificate # reference(s) (if known).

- The type of review (new product, design change, shelf-life extension, etc.).

- Brief product description, including classification (with Rule according to Annex VIII).

- Conformity assessment route requested, analytes and technology involved.

- BSI Ref. number (Service Management Order (SMO) #) for any other relevant submissions (e.g., concurrent applications that may affect the submission).

- An explanation of what has been submitted and how it demonstrates compliace

  For surveillance reviews:
  - A detailed list of all changes since the last review, along with a justification for whether the changes are considered to be significant or not.

  For changes to existing certification:
  - What is affected (packaging, material change, life, etc.).
  - What is not affected (along with appropriate justification).

Note: a possible format could be a table based on the sections of the Technical Documentation, as below:

Technical Documentation section	A/NA?	Description of evidence submitted; for changes, impact on compliance or rationale for why this section is not affected

2 The technical documentation

The IVDR is a new legislation. For initial approvals, a complete submission with all the relevant Technical Documentation included is required even if the device was previously certified under the IVDD.

To assist in determining the correct information to provide to BSI, a comprehensive checklist (i.e., BSI Completeness Check Form - MDF9003) of the documents required to be submitted as part of Technical Documentation is provided to Manufacturers. Guidance on each of the items requested in the Completeness Check Form can be found in Appendix A of this document. Additional guidance may be found in reference documents listed in Appendix B.

For submissions in the context of scope extensions or substantial change approvals, as far as is practical, submissions should be standalone and not refer to previous submissions as evidence of compliance. The reviewer must be able to assess the documentation in the context of the intended submission and confirm it is still relevant within this context. If a submission draws on information previously submitted to BSI, please include the relevant report or document which demonstrates compliance, rather than directing the reviewer to an earlier review. Overall, this will save time (e.g., in finding the report, confirming that the correct report has been found, confirming whether there have been any changes affecting its relevance to the current application, etc.).

3 Authorisation for work to be conducted

A signed approved quote will be required before work can commence. If this is not already in place, please contact your BSI Scheme Manager or BSI Sales Team.

Verification of performance

For Class D devices (and others, if requested), IVD devices will be required for testing by an EU Reference Laboratory (EURL) to verify performance. Scientific Opinion of the EURL will be sought for the verification of performance claims made by the manufacturer (Article 48 (5)). A positive opinion from the EURL will be needed for certification of the device. This will be discussed in more detail upon application.

Information Required to Support Verification of Manufactured Product (Class D only)

Prior to the verification of performance, the EURL must first establish the performance criteria. This will be conducted in parallel to the Technical Documentation review. The following will be required:

- Batches of product must be sent to the EU Reference Laboratory to establish criteria.

- These batches must meet the manufacturers QC specification and be provided in the same configuration as the Technical Documentation submitted, with components clearly labelled with name, lot number, expiry date and final draft IFU.

On-going batch release will require, in addition to sending IVD devices to the EU Reference Laboratory as required, the following documentation:

- The final QC release testing for that batch performed by the manufacturer.

- Labelling (component and box labels as on the batch including lot number and expiry, as well as the IFU).

Submission Method

- The preferred route for submissions is via the secure **BSI Electronic Client Portal.** If you do not have access to the BSI document upload portal, please contact your Scheme Manager or their administrative support to request for this to be set up for your company.

- If the above method is not suitable or does not work, please contact your BSI representative to discuss alternate methods of document submission. Please note that documents submitted via any alternate methods will need to be uploaded to our electronic document management system by our administration team, which may add time and cost to the review.

- We **do not accept** hard copies of technical documentation.

Document format

Language

All submitted Technical Documentation and test results must be in the English language. Exceptions may be allowed in the case of voluntary change of Notified Body (Transfer from another Notified Body to BSI). Please contact the BSI Account Manager or your BSI Scheme Manager for further details in case of Transfers.

Electronic File Format

Format and file size limits

- Documents should ideally be provided as paginated, fully searchable bookmarked PDF files (see text below for further information on text recognition and bookmarks). Other software formats may be acceptable, but again, these files will need to be converted to PDF files with bookmarks, which will add time and cost to the review. Significant delays may result if files cannot be easily converted to this format.

- Manufacturers should submit one PDF for each part below (Table 1). If not possible, for example, for analytical verification, manufacturers are recommended to break it down into sub-sections.

- PDF files and attachments should not be file protected or locked as this prevents necessary access and file manipulation for archiving.

- File names should be logical and reflect the information covered within that part. The checklist should use the file names.

- Documents should be bookmarked to ensure ease of navigation (see section below for more information relating to bookmarking).

- **It is strongly recommended that one PDF file is submitted for each part specified in the table overleaf.** If this is not possible due to file size, consider breaking it down into the smallest number of logical sub-sections possible. Separate submissions will need to be indexed and consolidated, which may add to the time and cost of the review.

Parts	IVDR Cross-references	BSI Completeness Check Reference to Technical Documentation Checklist
Part A - Device Description and Specifications including variants and accessories	Annex II, Section 1	Section 4.2, Part 1
Part B - Information to be supplied by the manufacturer	Annex II, Section 2	Section 4.2, Part 2
Part C - Design and manufacturing Information	Annex II, Section 3	Section 4.2, Part 3
Part D - General safety and performance requirements	Annex II, Section 4	Section 4.2, Part 4
Part E - Benefit-Risk Analysis and Risk Management	Annex II, Section 5	Section 4.2, Part 5
Part F - Product verification and validation Information on analytical performance of the device	Annex II, Section 6.1	Section 4.2, Parts 6.1, 6.2.1 - 6.2.3, 6.2.6 – 6.2.9, 6.3, 6.4
Part G - Product verification and validation Information on clinical performance and clinical evidence. Performance evaluation report	Annex II, Section 6.2	Section 4.2, Parts 6.2.4, 6.2.5, 6.2.6 - 6.2.10
Part H - Product verification and validation Stability	Annex II, Section 6.3	Section 4.2, Parts 7.1 - 7.3
Part I - Product verification and validation Software verification and validation	Annex II, Section 6.4	Section 4.2, Parts 3.2, 4.7
Part J - Declaration of Conformity	Annex IV	Section 4.2, Part 7.4
Part K - Product verification and validation Additional information required in specific cases	Annex II, Section 6.5	N/A

Optical Character Recognition (searchable format)

- Manufacturers scanning directly from printed pages should utilise Optical Character Recognition (OCR) so that as much of the resultant PDF file is searchable as possible.

- Non-searchable submissions will be subjected to OCR conversion adding review time.

Bookmarks

- Bookmarks are requested to aid in locating major sections of the technical documents. As a minimum, sections in IVDR Annex II "Technical Documentation" should be bookmarked (as per recommendation in table above).

- Where possible, individual documents cited as supporting attachments should also be bookmarked.

- Sometimes random bookmarks based on document headings and subheadings are created when documents are converted to PDF format. These bookmarks should be edited to provide clear document references and to remove excessive, unnecessary or confusing bookmarks.

Clear organization and easy navigation will make it easier to find documents and will therefore reduce overall time required for the review.

Pagination

- Each page of the submission should have a separate, sequential page number. Each page should have a unique number irrespective of the total number of pages in the Technical Documentation.

- PDF files are automatically numbered. Where possible, please always provide reference to the pagination in the PDF file as this will aid the Technical Documentation review. Where this is not possible, please make it clear what the page number refers to.

- Pagination is not mandatory, as BSI can add this with our software. Formatting such as this will likely increase the time for review.
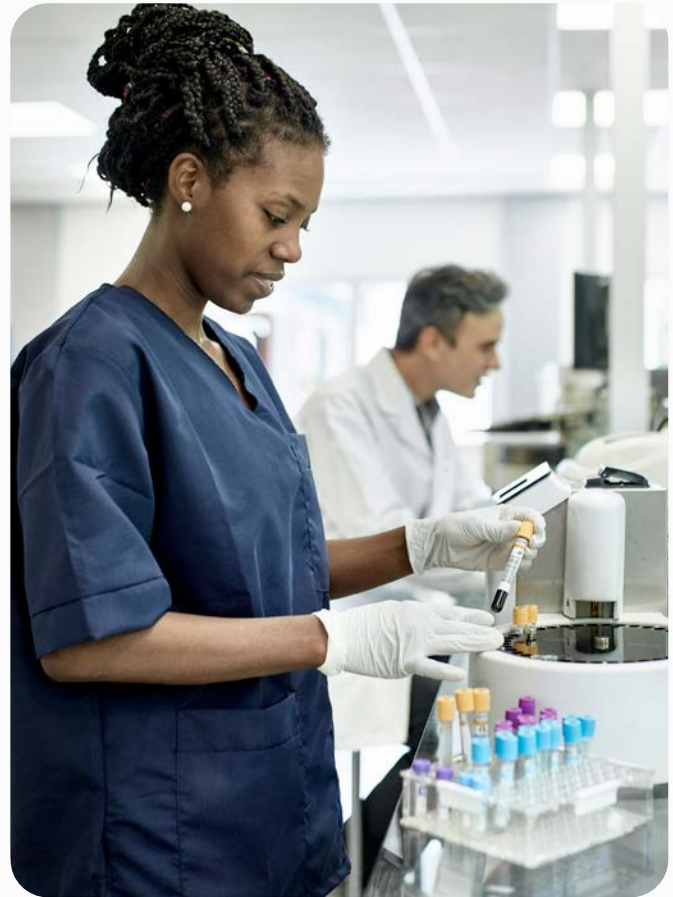
Signatures

Signatures are required for any signed document in the file, including signed quotes and BSI Work Authorisation Forms. Signatures can be handled in several ways:

- Documents may be digitally signed.

- Signature pages can be scanned in and inserted into the electronic document.

- A "marker page" can be inserted into the document indicating that the signatures have been provided separately to BSI electronically. BSI will scan and insert these pages into the file, logging the time to do so.

- All protocols/reports which require approval (as per the legislative requirements and manufacturer's own procedures and policies), except for the Declaration of Conformity, must have undergone those requisite approvals and be submitted with evidence of those approvals (typically through dated and signed reports, signed protocols, or evidence of approval in an electronic system etc.).

Submission process

The following is an overview of the submission process:

a Notify BSI that you have an application for review. For new clients, this will generally be via a member of the **sales team**. For existing clients, this will be your Scheme Manager, or a member of the administration team. Email and phone are the preferred means of contact.

b For initial IVDR work, a formal quotation will be required.

c Once the signed approved quote has been submitted, BSI will assign a reviewer. At that time BSI will assign the relevant certificate references and/or a unique identification number (i.e., Service Management Order Number) for your review and contact you with those references. We ask that you reference those numbers during document submission via the BSI portal or in any email correspondence with BSI during the review process.

d Manufacturers may be required to complete an IVDR Completeness Checklist prior to the start of the detailed review. This ensures all documents needed to initiate the review have been included as part of the Technical Documentation submission (Appendix A). This ensures much of the first round of questions is not used to ask for key missing information. The requirement for this will be discussed with your Scheme Manager following quote approval.

e The Conformity Assessment of the Technical Documentation review can be planned upon receipt of a signed quote together with all required application documentation (per Annex IX for initial submissions) and BSI acceptance of the IVDR completeness checklist, where appropriate.
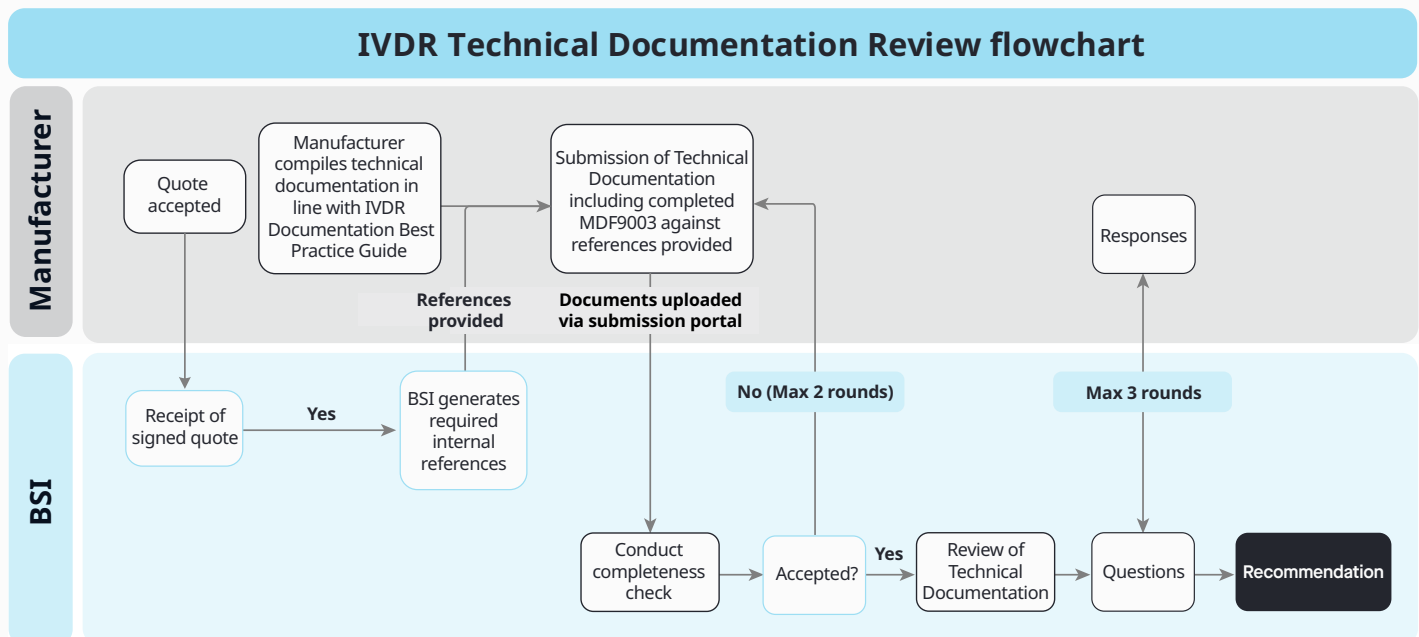

Figure 1: overview of the BSI submission process and individual responsibilities.

Note: manufacturers must submit the completed technical documentation completeness checklist and technical documentation to BSI at the same time.

Additional topics to consider when preparing Technical Documentation for submission

Manufacturer personnel support

Please ensure appropriate manufacturer resources (RA, QA, R&D, Manufacturing, etc.) are available during Technical Documentation review (standard or dedicated). The more quickly information is provided, the more quickly questions can be closed to progress towards certification.

Document availability

If a document includes hyperlinks or cross-references to other documents or embedded documents, ensure that these are functional, and all the documents are available. Where appropriate, relevant information must be provided in the IVDR Technical Documentation Completeness Check, to be completed by the manufacturer at the time of submission. If specific essential documents are not provided or incomplete, this may delay the start of Technical Documentation review. Please remember the reviewer must see the manufacturer's conclusions regarding compliance, as well as the objective evidence necessary to support those conclusions. It is possible the technical expert may need additional information and/or documents on initiation of the detailed Technical Documentation review.

Languages

As part of the quality system, or of the documents defining the manufacturing process, the manufacturer should have procedures for ensuring accurate translation of labelling, instructions for use, product claims in marketing materials, SSPs etc. These are especially important for user instructions where the safety and claimed performance of the device may be compromised through inadequate translation or the SSPs where inaccurate information may be presented to the end-users or patients through inadequate translation.

Certificate scope

Sometimes the addition of new products, or even changes to existing products, can affect the scope of the associated Quality Management System (QMS) certificate (e.g., Annex IX certificates). If the scope(s) of the existing certificate(s) does not cover the analyte, product or technology, additional work and time will be required to re-issue the affected certificates:

- Sufficient evidence must be reviewed to support scope change. This may require Quality System or Microbiology audits in addition to the Technical Documentation review requested

- If in doubt, discuss the scope with the BSI Scheme Manager prior to submitting. The Scheme Manager will coordinate the scope change activities
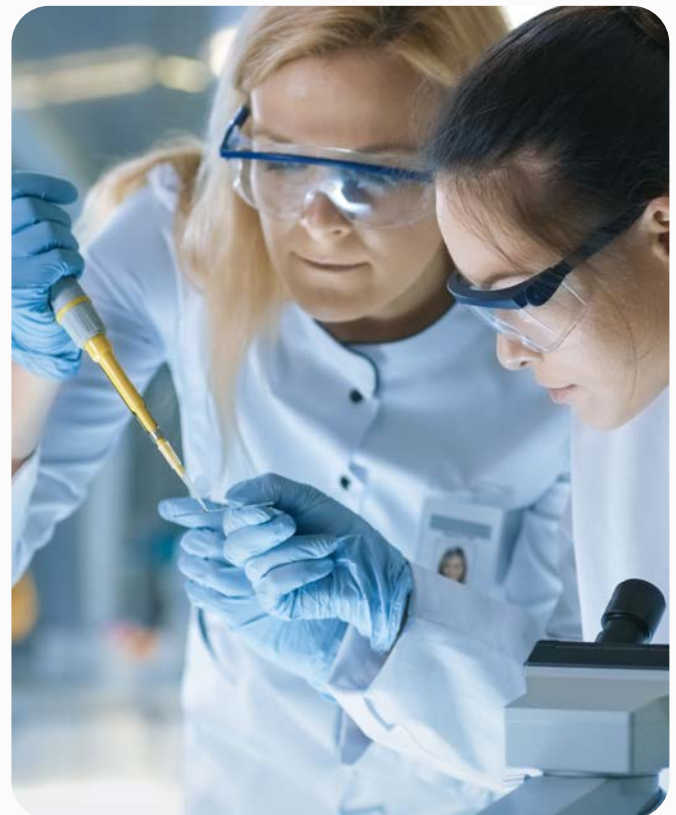
Subcontractors

BSI needs to be aware of any critical sub-contractors or crucial suppliers involved with the device. Depending on their activities and certification, BSI may need to perform verification visits at their sites.

Have there been any changes to sub-contractors or suppliers related to the application since it was made?

- All significant sub-contractors/crucial suppliers must be added to the Unannounced Audit Visit schedule. Please ensure that your Scheme Manager and reviewer are aware of any changes to critical sub-contractors or crucial suppliers. If you are unsure whether a sub-contractor/supplier is significant, discuss with your Scheme Manager or with the BSI Sales representative at the time of initial quotation

- Significant sub-contractors/crucial suppliers that do not hold a valid ISO 13485 certificate issued by an EU Notified Body or one of its direct subsidiaries may require a sub-contractor audit, depending on the scope of their activities and the verification activities undertaken by the manufacturer. There may be instances where a verification visit at the premises of the significant subcontractor/crucial supplier is needed, even if they hold ISO 13485 certification from a Notified Body. Please ensure that these details are made clear in the application

- If design is sub-contracted, control of this sub-contracted activity must be considered

Accessories

Please provide the following information for any accessories associated with your device:

- Brief description of the accessory(ies) and how they are used with the device(s).

- Classification of the accessories and rationale for classification.

- Technical Documentation references (file name, issue status, date).

Novelty

Are any new technologies (or analytes) associated with the IVD? If so, this may require additional time as consultation with an external expert may be required. BSI reviewers will still work within timescales indicated for the review process selected, but external consultations may not fall within these timescales. As a result, review timelines cannot be guaranteed. Please discuss with your Scheme Manager, to select the most appropriate review option.

Additional considerations for desktop audits

Surveillance audits will be remote (i.e., performed as a "desktop" audit). It is important that all necessary information is included to avoid delays once the reviewer has set aside time to review the file. Manufacturers should provide the following information:

- Main Technical Documentation body as well as key supporting documents or attachments. In general, if a document is listed as evidence in the General Safety & Performance Requirements checklist or equivalent document, the reviewer(s) may expect to review the corresponding document(s) as evidence of compliance with the relevant General Safety & Performance Requirements.

- A summary of any changes to the device since the last Technical Documentation audit.

- Information on engagement with any global regulatory bodies in respect of legal compliance or other issues.

- Information on any changes to the quality system or management.

Additional review time may be required in the following cases:

- Devices using electronic IFU per Regulation 207/2012.

- Class C software per EN 62304 (this requires additional audit time).

- Reviews requiring input from external expert(s).

- Technical Documentation with poor traceability, incomplete or missing information

Appendix A

Information to provide in a Technical Documentation Submission

Administrative information	
Overview of the submission	The application should clearly state if it is a new certification or scope extension (including changes to design, indications for use etc.) and list any previous related submissions. A summary of details to be included in the cover letter are highlighted in the Cover Letter Section. If a change is being requested, complete relevant information in MDF4900. The document index should include the title of the file and revision history. Individual documents should also indicate date, revision history and status. It is highly recommended for manufacturers to provide a summary of the Technical Documentation (sections in IVDR Annex II) to aid document review. Manufacturers must also indicate which regulation applies. If the device contains a medical device (e.g., lancet or swab), please confirm this has been reviewed under the medical device regulation.
Manufacturer name and address	The application should identify the name and location of the legal manufacturer who is placing the devices on the market. This should be consistent across the device labels, IFU and Declarations of Conformity. The Single Registration Number (SRN) of the legal manufacturer should be identified. Referred to in IVDR EU 2017/746, Article 10.
Single registration number (SRN)	A Single Registration Number (SRN) is a unique code that is assigned to manufacturers, authorised representatives or importers after they have registered in the European Database on Medical Devices (EUDAMED). Note: manufacturers are not expected to declare an SRN until the ACTOR module in EUDAMED becomes mandatory.
Device name(s)	State the name(s) of the device as it appears on the labelling and associated documents.
Basic UDI-DIs covered	The submission should include the basic UDI-DI assigned by the manufacturer to the device, as soon as identification of this device becomes based on a UDI system or otherwise a clear identification by means of product code, catalogue number or other unambiguous reference allowing traceability. Refer to IVDR EU 2017/746 Annex VI, part C.
Impacted BSI certificates	The certificate identifiers of all BSI certificates currently held by the manufacturer.
Date of submission	This should ideally be presented as DD-MMM-YYYY (e.g., 25-JAN-2023) or YYYY-MM-DD (e.g., 2023-01-25) to prevent any ambiguity.

Device description and specifications including variants and accessories

Intended purpose	The intended purpose should provide sufficient detail to explain: • What is to be detected and/or measured, and whether it is qualitative, quantitative or semi-quantitative. • Its function (i.e., screening, monitoring, diagnosis or aid to diagnosis, prognosis, prediction or companion diagnostic). • How the result relates to a diagnosis including any specific disorder, condition or risk factor of interest that it is intended to detect, define or differentiate. • It should include the basic principles of operation (i.e., intended users and environment, whether it is automated or not and the type of specimen(s) required). • The intended patient population of the device. • Intended user, as appropriate (e.g., self-testing, near-patient or laboratory professional use etc.). • For companion diagnostics also include the relevant target population and the associated medicinal product(s) (i.e., International nonproprietary name or INN). Please ensure the intended use is described consistently throughout the file (e.g., in the IFU, risk management documentation, performance evaluation report and design requirements, Declaration of Conformity and SSP (where applicable)). If the application includes a change to the intended use, all sections of the file should be reviewed for potential impact. For clarity it is suggested this should be separate from the device description. Refer to IVDR EU 2017/746 Annex I, 20.4.1. The submission should include the description of the principle of the assay method or the principles of operation of the instrument per Annex II, 1.1(d). For instruments of automated assays, the submission should include the description of the appropriate assay characteristics or dedicated assays per Annex II, 1.1(i). Additionally, devices with automated assays must include a description of the appropriate instrumentation characteristics or dedicated instrumentation (Annex II, 1.1(j)).
Devices covered by the Technical Documentation	The submission should include a description or complete list of the various configurations/ variants of the device that are intended to be made available on the market. Refer to IVDR EU 2017/746 Annex II, 1.1.
Qualification and classification	The submission should include the rationale for qualification of the product as an IVD device and classification of the device including the justification for the classification of all rule(s) applied or excluded. Please also include a confirmation and rationale for the device falling under the scope of the IVDR. Refer to IVDR EU 2017/746 Annex VIII and Annex II, 1.1. For additional guidance on device classification, refer to the MDCG documents published on the EU Commission website.

Device description and specification	The device description should enable understanding of the design, composition and presentation or other characteristics of the device and should include product or trade name. A general description of the device including its intended purpose and intended users should also be provided. Please also include a description of all accessories included, not included but required for proper functioning of the device, and other products that are not devices, which are intended to be used in combination with the device. Refer to IVDR EU 2017/746 Annex II, 1.1.
Reference to previous and similar generations of the device	The submission should include an overview of the previous generation(s) of the device produced by the manufacturer and an overview of identified similar devices available on the Union or international markets, where such devices exist. All submissions should be accompanied by a market history to enable an understanding of the context of device development. • If the device is new and has never been marketed by the manufacturer anywhere in the world, please state this explicitly. • For initial applications under the IVDR, please confirm whether the device has been previously marketed under the IVDD and whether any changes have been made in comparison to the device on the market under the IVDD. • Market history should include EU and approvals in other geographies. If the device is a system, ensure that the number of units sold is broken down by device component and per year. Refer to IVDR EU 2017/746 Annex II, 1.2.
Devices that are provided by distance sales	For devices that are provided by distance sales, the submission should include a description of how the device meets the requirements of article 6. This should include a description of: • How the device is ordered and how the results are presented to the user. Include examples of order forms and/or results reports where applicable. • Where the testing is performed (if applicable), including any relevant certification/accreditation held by the test site.

Information supplied by the manufacturer

Labels and instructions for use

Medical devices generally use multiple levels of labelling and it is recognized that not all devices may have the different levels of packaging specified in this section or different terms may be used than those specified here.

Legible versions of all applicable levels of labels should be provided (e.g., secondary pack, primary pack) and should be representative of the finished form, showing all included symbols.

If possible, provide drawings with the packaging configuration (showing placement of all labels) and label specifications.

The position of labels on the finished product should be clear. If the device has a sterile package, clearly identify the label for the sterile package. If any of the packaging is printed with information for the user (including pictures/schematics of the device) this should also be provided.

Please ensure that any specific requirements of relevant harmonised standards or Common Specifications are addressed in the labels and information for use. The submission should include a complete set of:

- Labels on the device and on its packaging, such as single unit packaging, sales packaging, transport packaging in the case of specific management conditions.

- Instructions for use (IFU) and any material in which claims are made (e.g., promotional material). These must be available in all languages for territories in which the product is intended for sale. As a minimum, manufacturers must submit the English IFUs and promotional material at the time of submission.

- For self-test and near-patient testing devices, manufacturers must provide a clear demonstration of conformity to the specific requirements.

Only marketing literature that mentions the device fulfils the requirements of CE marking or includes the CE mark itself is required to be provided. Supporting evidence should be provided in the relevant pre-clinical and clinical sections to substantiate any claims made in the labelling or marketing literature.

Refer to IVDR EU 2017/746 Annex I, Chapters II and III.

Design and manufacturing information

Materials and components

This shall include a description of the critical ingredients of the device such as antibodies, antigens, enzymes and nucleic acid primers provided or recommended for use with the device.

Refer to IVDR EU 2017/746 Annex II, 3.1.

System overview

The submission shall include the design stages applied to the device. This should allow the reviewer to understand how the different components/ systems fit together.

- For devices incorporating instruments and/or software, please provide an overview of the entire system. Please indicate the transition steps and whether manual handling/manipulation are required.

- For instruments, please provide a description of the major subsystems, analytical technology and any dedicated computer hardware and software.

System overview - continued	• Where the device uses software for objective data interpretation or the device is a software in itself, please provide a description of the data interpretation methodology (i.e., analysis algorithm). Please state whether this is automated or manual. • For devices intended for self-testing or near-patient testing, manufacturers must include a description of the design aspects that make them suitable for self-testing or near-patient testing. Refer to IVDR EU 2017/746 Annex II, 3.1.
Manufacturing information	The manufacturer shall include a detailed overview of the manufacturing processes to enable understanding of the finished device. Please note: BSI auditors will review more detailed information as part of the QMS audit. Please provide detailed information on: • In-process QC, including the acceptance criteria and a completed batch record from a sample batch. • Final release QC, including the acceptance criteria and a completed batch record from a sample batch. Refer to IVDR EU 2017/746 Annex II, 3.2. For Class D devices without EURL that have previously been on market provide the batch release trend data, include graphs, any analysis or trends and actions taken.
Sites involved in design and manufacturing activities	Please identify all sites involved in the manufacture of the finished device including crucial suppliers and significant sub-contractors, indicating which activity is performed at the corresponding site. The following must be clearly identified: • Legal manufacturer; • European representative, if applicable (Article 11); • Site with design responsibility; • Site(s) performing final release testing and; • Where sterilisation is performed (if applicable). Only one EU Representative should be identified, and this should be consistent across the device labels, IFU and Declaration of Conformity. If significant sub-contractors/crucial suppliers are used, provide copies of their ISO 13485 certificates, if not provided already. If a sub-contractor/ supplier does not have an ISO 13485 certificate from a Notified Body, additional supplier audits may need to be arranged and should be discussed during application. If they hold ISO 13485 certification from a Notified Body, there may be instances where BSI would still need to perform a verification visit.

General safety and performance requirements (GSPRs)

Demonstration of conformity with GSPRs	The submission should include information that demonstrates conformity with the general safety and performance requirements set out in Annex I applicable to the device taking into account its intended purpose, and shall include a justification, validation and verification of the solutions adopted to meet those requirements. It is helpful to provide a checklist against the GSPRs, or other documented method to provide evidence of conformity to each requirement. Where a requirement(s) is not applicable, this must be clearly shown, with justification. • Manufacturers must state the method(s) used to demonstrate conformity to the corresponding GSPR. • All applicable harmonised standards, guidelines, regulations and common specifications used must be clearly stated. Where compliance is demonstrated against specific clauses/sections, manufacturers must state specific clause(s)/section(s) where partial compliance is demonstrated. • A summary or gap analysis regarding ability to comply with associated general safety and performance requirements, a risk analysis and conclusion of acceptability of any compliance gaps should be provided. • Please indicate if there have been any changes to applicable standards since the Technical Documentation was last reviewed by BSI. The Technical Documentation should continue to demonstrate that the files meet the state of the art, including consideration of revised or replaced standards. This will not be applicable for initial applications. • The **precise** identity of manufacturer document(s) demonstrating evidence of conformity to the corresponding GSPR must be stipulated. The technical reviewer must be able to use this to review compliance in the Technical Documentation, and/or the summary Technical Documentation, if provided. Refer to IVDR EU 2017/746 Annex I and Annex II, (4).

Product and design specifications	Manufacturers should provide an overview of the design inputs and key outputs, as well as a design traceability matrix.
	For self-tests or near-patients tests, the submission should clearly demonstrate how the device meets the requirements and should include:
	
	• Data showing the suitability of the device in view of its intended purpose for self-testing or near patient- testing.
	
	• Test reports, including results of studies carried out with intended user.
	
	• Pictures of the device should be included. BSI may request to be provided with an example of the device.
	
	• The information to be provided with the device on its label and its instructions for use including:
	
	  - The type of specimen(s) required to perform the test (e.g., blood, urine or saliva).
	
	  - The need for additional materials for the test to function properly.
	
	  - Contact details for further advice and assistance.
	
	Refer to IVDR EU 2017/746 Annex I, (19) and (20.4.2).

Chemical, physical and biological properties	The manufacturer must demonstrate consideration of risk related to chemical and physical safety, including risk of accidental ingestion. The manufacture must demonstrate risk of infection and/or contamination is reduced as far as possible.
Devices intended to be connected to other devices to operate as intended	For devices used in combination with other devices and/or electrical equipment, the manufacturer must demonstrate safety of the entire combination, including safe calibration, maintenance and disposal. The submission should include a description of the total combination including proof this conforms to the requirements set out in GSPR 13 to maintain the specified characteristics.
Devices with a measuring function	In the case of devices placed on the market with a measuring function, the submission should include a description of the methods used in order to ensure the accuracy as given in the specifications. Units of measurements must conform to the provisions of Council Directive 80/181/EEC.
Protection against radiation	For devices emitting radiation, manufacturers must demonstrate evidence that exposure levels are appropriate for the intended purpose and have been reduced as far as possible. Where relevant, manufacturers must demonstrate control of hazardous levels by the intended user(s). Necessary detail must also be captured in the IFU especially guidance on user protection and avoidance of misuse.
Software - EN 62304 checklist	Appropriate documentation is required if the medical devices are either stand-alone software or rely upon software. Manufacturers should clearly state whether the device is a software in itself, or whether this is needed for the proper functioning of the device, as intended. The submission should include a description of any software to be used with the device, either as an integral part, or associated with the device in order for its safe use. Manufactures should include a checklist to demonstrate compliance with EN 62304. Refer to IVDR EU 2017/746 Annex II, 1.1. If the IVD medical device is a standalone software, guidance for the qualification and classification of the software can be found in MDCG 2019-11. Please include rationale for why the software is a medical device and its corresponding classification. If applicable, the software should be broken down into modules, some that have a medical purpose and some that do not. The modules with a medical purpose must comply with the requirements of the IVDR and must carry the CE mark. The non-medical device modules are not subject to the requirements for medical devices. Ensure all relevant harmonized and non-harmonised software standards have been considered. Ensure the software systems/modules/items have been assigned safety classifications based on the relevant standards.

Software - EN 62304 checklist - continued	Include documentation on the medical device software life-cycle processes implemented (e.g., software design/development, maintenance/change management, risk management, configuration management, problem resolution, verification, and validation processes). If software is intended to be used with mobile computing platforms, include information on specific features of mobile platforms demonstrating compliance with GSPR 16. The documentation shall contain evidence of software validation as used in the finished device. It shall also address all of the different hardware configurations and, where applicable, operating systems identified in the labelling. Include IVD software lifecycle documentation and related procedures (e.g., software development plan, software requirements specification, risk management and issue resolution). Refer to IVDR EU 2017/746 Annex II, (6.4).
Software development plan	Include software development procedures and the software development plan (SDP) detailing the activities completed as part of the software development lifecycle (e.g., software requirements specification, software architecture, software detailed design, software unit testing procedures/ reports, software integration testing procedures/reports, and software system testing procedures/reports). Documentation related to the software maintenance and software configuration management processes should also be provided (e.g., software maintenance plan, configuration management plan). **Note:** some documentation may or may not be required per the standards based on software system/module/item risk classification.
Software requirements analysis	Include the software requirements specification (SRS). An explanation regarding how the software requirements have been derived from higher level system requirements should be included and traceability to those higher-level requirements should be established. Risk controls implemented in software should also be included in the SRS. Software requirements should be clearly stated, be unambiguous, and should be readily translatable into verification acceptance criteria. **Note:** see EN 62304 Clause 5.2.2 for generally expected categories that should be covered in the software requirements specification.
Software architectural design	Include the software architectural design (SAD). The SAD is generally represented graphically (e.g., class diagrams, block diagrams, etc.) and shows how the software requirements are allocated to the **software items** that comprise the overall **software system**. The following major areas should be addressed in the software architectural design: • Internal and external interfaces of the software; • Inclusion of any Software of Unknown Provenance (SOUP) and; • Segregation measures that may be necessary for risk control purposes.

Software detailed design	For EN 62304 Software Safety Class 'B' and 'C' software, include the software detailed design (SDD). The software detailed design (SDD) represents a further refinement of the software architecture described in the SAD. The SDD should clearly identify the **software units** that are derived from the **software items** specified in the software architecture. The SDD should provide details regarding the function and expected inputs and outputs of the **software units**. In general, the SDD should provide enough detail to allow correct implementation of the **software units** and their expected interfaces.
Software unit implementation and verification	For EN 62304 Software Safety Class 'B' and 'C' software, include evidence of **software unit** verification. These may include unit test protocols/scripts and associated reports. Note that this type of testing is usually considered "white box" testing in that detailed knowledge of the underlying software code is usually required to properly design the unit verification tests. Where automated testing has been used to perform verification activities, include the test scripts and the test log results in the submission documentation.
Software integration and integration testing	For EN 62304 Software Safety Class 'B' and 'C' software, include evidence that software integration testing has been performed. Please note that this testing should be aimed at showing how the **software items** (which are internal to the **software system**) function as expected when integrated together. Areas to investigate can include, for example, expected timing, functioning of internal and external interfaces, and testing under abnormal conditions/foreseeable misuse. This testing is typically not conducted on the final, compiled code and will normally make use of a test/simulation environment where various combinations of **software items** can be tested in isolation. It is permissible to combine software integration testing with software system testing. Where this strategy has been employed to cover the requirement to perform software integration testing, this should be clearly explained in the submission documentation. Where automated testing has been used to perform verification activities, include the test scripts and the test log results in the submission documentation.
Software systems testing	Include the software system test protocol(s) and report(s). This testing should demonstrate that each of the software requirements have been verified. It is expected that traceability between the software requirements and the software test cases/test procedures should be established. This testing is typically conducted on the final, compiled **software system**. Input stimuli, expected outcomes, pass/fail criteria, and test procedures should be clearly established in the test documentation. Where test failures or deviations have been encountered, these should be clearly documented and justified in the provided reports. Where automated testing has been used to perform verification activities, include the test scripts and the test log results in the submission documentation.

Software release	Include the list of known residual anomalies. The following information on each remaining anomaly should be included: • Unique Identifier; • Brief description of the issue; • Severity/risk level and; • Justification for why it is acceptable to release the software with the anomaly. Also include documentation showing how the released software was created (e.g., procedure and environment used create the released software). The final released software version number should be identified in this documentation. Documentation explaining how the released software is archived and how it can be reliably delivered (e.g., to the manufacturing environment or to the user of the software) should be included.
Software risk assessment	Include software risk assessment documentation (e.g., software hazard analysis, software failure mode and effects analysis, fault tree analysis, traceability). **Note:** some documentation may or may not be required per the standards based on software system/module/item risk classification. Include documentation related to the design and maintenance of the cybersecurity features of the IVD medical device. Documentation should include the security risk management plan, security risk assessment, and verification/validation evidence for the identified security risk controls. Threats and the associated protections needed to ensure the **confidentiality**, **integrity,** and **availability** of the data, function and services of the medical device should be considered. Documentation showing how cybersecurity threats are monitored and responded to as part of the postmarket surveillance of the device should also be provided. Note: see MDCG 2019-16 Guidance on Cybersecurity for Medical Devices.
Electrical safety and electromagnetic compatibility	If the device incorporates or depends on an energy source, manufacturers must demonstrate due consideration for: • Single fault conditions; • Patient safety; • Electromagnetic interference and; • All risk associated with accidental electric shock. Refer to IVDR EU 2017/746 Annex I, (GSPR 17).
Protection against mechanical and thermal risks	For instruments, manufacturers must show evidence that the device is able to withstand stresses in the planned work environment(s). Any risks associated with moving parts, substance leakage, vibrations, noise and temperature of accessible parts must also be considered.

Benefit-risk analysis and risk management

Risk management

Manufacturers must provide their risk management procedure, plan detailing the scoring system used and a risk management report concluding whether the risk is un/acceptable. This must be iterative and continue for the lifetime of the device. Manufacturers must demonstrate systematic updates of the corresponding risk management documentation.

The risk management documentation should include:

- A risk management plan for each device or group of similar devices.
- A copy of the risk management procedures that include the definitions of any rating systems used for risk analysis and risk acceptability should also be provided.
- Identification and analysis of the known and foreseeable hazards associated with each device.
- Estimation and evaluation of the risks associated with, and occurring during, the intended use and during reasonably foreseeable misuse.
- Elimination or control of the risks identified (refer to IVDR EU 2017/746 Annex I, Section 4).
- Evaluation of the impact of information from the production phase and, in particular, from the post-market surveillance system, on hazards and the frequency of occurrence thereof, on estimates of their associated risks, as well as on the overall risk, the benefit-risk ratio and risk acceptability.
- Based on the evaluation of the impact of the information, if necessary, amend control measures in line with the requirements of (refer to IVDR EU 2017/746 Annex I, section 4.

The risk management documentation should provide a template for preparedness, indicating whether controls (i.e., process validations, performance evaluation, stability, usability or other key verification/validation tests) have reduced all risks as low as possible (vs. as low as reasonably practicable) to acceptable levels in light of state-of-the-art for the product(s) under review.

The assessment must demonstrate that all known and foreseeable risks, and any undesirable effects shall be minimised and be acceptable when weighed against the evaluated potential benefits to the patients and/or the user arising from the intended performance of the device during normal conditions of use.

For devices based upon existing devices, the manufacturer may conclude that pre-existing risk management documentation is applicable. However, there are always risks associated with even small changes, and a summary to demonstrate that these risks have been considered (and have been adequately mitigated) should be provided.

Guidance on the risk management process is available in EN ISO 14971 - Medical devices - application of risk management to medical devices.

Product verification and validation

Specimen type	Manufacturers must stipulate the specimen(s) to be used for the proper functioning of the device, (e.g., formalin fixed paraffin embedded tissue, first catch urine sample or plasma ctDNA). Representative data must be generated using all intended specimen types to demonstrate no loss in the functionality of the device. Any time-critical methods must be clearly defined in the IFU, with supporting data in the Technical Documentation. Where applicable, the submission should include a description of the specimen collection and transport materials provided with the device or descriptions of specifications recommended for use. Where more then one specimen type is intended to be used, a concordance study between thespecimen types is expected. Refer to IVDR EU 2017/746 Annex II, 1.1

Performance evaluation and clinical evidence

Performance evaluation and clinical evidence	The submission should include the following evidence of performance evaluation:
	
	• Performance evaluation plan and report (Annex XIII, section 1.1 and Annex VIII, section 1.3.2, respectively) – this must be maintained for the lifetime of the device.
	
	• Scientific validity (Annex XIII, Section 1.2.1) – used to demonstrate the usefulness of the marker(s) or analyte(s) in the context of the intended use.
	
	• Analytical performance plan(s) and report(s) (Annex XIII, Section 1.2.2) - see additional detail below.
	
	• Clinical performance plan(s) and report(s) (Annex XIII, Sections 1.3.1, 2.3.2 and 2.3.3) including, if applicable:
	
	  - Clinical performance studies – plan and report, if relevant (Annex XIII, 2);
	
	  - Scientific peer-reviewed articles and;
	
	  - For legacy devices, this could also be published experience gained by routine diagnostic testing and/or market data.
	
	The performance evaluation report will include the individual reports on:
	
	• Scientific validity;
	
	• Analytical performance and;
	
	• Clinical performance.
	
	These will be used to assess conformity of the device against the applicable GSPRs. The conclusions from these reports will also constitute the clinical evidence for the device.
	
	Refer to IVDR EU 2017/746 Annex XIII.
	
	Analytical performance must be demonstrated per the requirements of Annex I Section 9.1. The submission should include the results and critical analyses of all verification and validation studies undertaken to demonstrate conformity of the device with the requirements of the Regulation under the conditions of the devices intended use. Device claims may be made in the IFU, labelling or any other material (e.g., on websites).

Performance Evaluation and clinical evidence - continued

This should include studies to demonstrate:

- Analytical sensitivity;
- Analytical specificity;
- Trueness (bias);
- Precision (repeatability and reproducibility);
- Accuracy (analytical and clinical);
- Limits of detection and quantitation;
- linearity;
- Assay cut-off;
- Sample handling;
- Interfering substances (endogenous and exogenous) and;
- Cross-reactivity.

Where are of the analytical performance characteristics above are deemed by the manufacturer to be not applicable, an appropriate justification shall be provided in the technical documentation.

Refer to IVDR EU 2017/746 Annex I, Section 9.1 and Annex II, Section 6.

Clinical performance must be demonstrated in relation to the performance characteristics listed in Annex I Section 9.1 (b). Where any of the clinical performance characteristics are deemed by the manufacturer to be not applicable, an appropriate justification shall be provided in the technical documentation. This section must also include evidence the device performs as intended by the intended users (i.e., usability engineering).

Summary of safety and performance

For Class C and Class D devices the summary of safety and performance (SSP; Article 29) must also be provided. This should be written clearly and understandable to the intended user and patient (if relevant) and should contain all elements list in Article 29 (Section 2), as well as a revision history that details:

- The SSP revision number;
- The date issued;
- A description of any changes and;
- Whether or not the revision has been validated by the notified body and in which language.

There is also a MDCG guidance document that contains details of a template that should be used for preparing the SSP, MDCG 2022-9 Summary of Safety and Performance Template Under Regulation (EU) 2017/746. A draft document in English is acceptable at the time of submission.

Once the SSP has been finalised based on the BSI review, manufacturers should submit the final version of the English SSP, in printable PDF format and is printable, searchable before a certificate recommendation can be made.

The SSP shall be updated as indicated in Article 56, over the lifetime of the device as needed, and updates should be defined in the Post-Market Surveillance Plan.

Summary of safety and performance - continued	For Class C devices without a product specific certificate, the IVDR allows NBs to choose representative devices from the generic device group for the assessment of Technical Documentation. The SSPs for such devices chosen as the representative sample(s) will be validated by the NB as part of the Technical Documentation assessment for those device(s). NBs are also required to upload the unvalidated SSPs of the devices that were not chosen as representative devices (but are part of the same generic device group) to EUDAMED. Hence manufacturers may submit these unvalidated SSPs at any time during the certification process to BSI, but before a BSI Scheme Manager prepares and makes a recommendation for certification based on the completion of all the required conformity assessments (including Technical Documentation assessment) for the relevant generic device group(s).

Post-market surveillance and post-market performance follow-up

PMS	Please provide sales, complaints and vigilance data for your device from at least the last 2 years for Class B and C devices and 3 years for Class D devices. This should include but is not limited to: • Sales and complaints data should include sales outside of the EU. A breakdown should be provided to enable evaluation of sales and complaints by region. • Serious incident reports, including information from periodic safety update reports and/or field safety corrective actions in the context of total and EU sale. • Records referring to non-serious incidents and data on any undesirable side-effects. • Information from trend reporting. • Publicly-available information about similar medical devices. Complaints data should be evaluated rather than just listed. For example, why is the complaints rate considered acceptable? Have any trends been analysed and noted, or corrective actions taken? What is the status of these actions? Has a comparison of PMS data been made to the expected occurrence in the risk assessment? Full details of vigilance issues should be provided, including the status of any Field Safety Corrective Actions or Notices, the associated CAPAs and patient outcomes. This data should include FSCA or FSN outside the EU, if related to a device which is sold in the EU. Please also ensure that all PMS data at the time of submission is up-to-date. **PMS Plan** The submission shall include the post-market surveillance plan as defined in Annex III. The plan must address all of the requirements of Annex III section 1(a) and (b). Annex III section 1(a) provides examples of relevant PMS data that shall be included in the plan. If any aren't applicable this should be documented. Other sources of PMS data can also be referred to, if they are relevant for the device. Annex III section 1(b) details the minimum content of the PMS plan. These requirements must be addressed in the plan in sufficient detail without needing to refer to other documents. Or, if other documents are referred to, these should be submitted for review. **PMS Report** Manufacturers of class B devices shall prepare PMS reports in line with Article 80. The PMS report shall be updated when necessary and made available upon request.

PMS *-continued*	**PSUR** Manufacturers of Class C and D devices shall also prepare an annual periodic safety update report for each device and, where relevant, for each category or group of devices summarising the results and conclusions of the analysis of the post-market surveillance data gathered as defined in the corresponding plan. This shall follow the requirements of Article 81. For Class C devices the PSUR should be made available upon request. For Class D devices the PSUR should be submitted to the Notified Body (Article 87). These documents must be updated at least annually. **PMPF Plan** Where applicable, manufacturers must also include a post-market performance follow-up plan (Annex XIII, Part B), or a justification of why this is not applicable. The PMPF plan should provide the specific objectives to be addressed by the PMPF along with the specific methods that will be applied to address Annex XIII Part B Section 5.1. The outcome of this must be documented in the post-market performance follow-up report. PMS reports, Post-market performance follow-up reports and PSURs are not required to be submitted as part of initial conformity assessment but where applicable, they shall be included in the technical documentation for IVDR surveillance reviews.
Product verification	If the device is Class D with a common specification, the manufacturer shall provide reference to the common specification applied. The manufacturer will be asked in due course to complete an additional form, MDF9002. If the device is Class D with no common specifications, this must be clearly stipulated. For all Class D devices that fall within the scope of a designated EURL category, a Device Submission Form will need to be completed with a summary of device specifics to enable requirements and protocol establishment for performance verification and criteria testing from EURLs.

IVDR Documentation Submission - Best Practice Guidelines

Stability

Stability including shelf-life

Shelf life is normally considered to be the time the device can be kept in the packaging prior to its first use. This is not the same as 'lifetime'. Shelflife testing is not restricted to the packaging. The device itself should be subject to shelf life testing, or a rationale provided to demonstrate why its characteristics are not expected to degrade over the claimed shelf life.

If shelf life testing is based on accelerated age testing, this should be accompanied by a plan for real time testing. Real time testing should be underway by the time documentation is submitted for review.

Extensions to shelf life must be reported to BSI for review and certificate re-issue. Shelf life validation should include:

- A protocol (with acceptance criteria for each test performed) and appropriate test references.

- A clear statement of the intended shelf life.

- If applicable, a clear statement defining the sterilisation status of the test samples (1X, 2X sterilised).

- A summary of the accelerated aging parameters (temperature and humidity) and how the aging times were calculated.

- A statement covering Real Time Aging plans.

- A clear delineation of statistically significant sample quantities.

- Actual physical/microbiological test data reports supporting the expiration date, or post aging, claim (leach testing, fluorescence decay, age of polymerase, etc.).

- A summary of the ship testing/transit simulation testing conducted and applicable test reports.

The submission should include the claimed shelf life, in-use, sample and shipping stability studies:

- Testing shall be performed on at least three different lots manufactured under conditions that are essentially equivalent to routine production conditions. The three lots do not need to be consecutive.

- Accelerated studies or extrapolated data from real time data are acceptable for initial shelf life claims but shall be followed up with data generated from real time stability studies.

- A protocol stating number of lots, acceptance criteria and testing schedule must be provided.

  - Where accelerated studies have been performed in anticipation of the real time studies, the method used for accelerated studies shall be described.

- The report must state all conclusions and claimed shelf life.

Stability including shelf-life *- continued*	• Data must be generated using at least one lot of reagents reflecting routine use of the device. Data can be generated using real or simulated conditions. This may include open vial stability and/or, for automated instruments, on-board stability and calibration stability. • All performance and stability claims must be supported by data. • Protocol(s) and report(s) stating all conclusions and claimed in-use stability must be submitted. Refer to IVDR EU 2017/746 Annex II, 6.3.

Packaging and transport/ shipping verification	Shipping and transport stability
	
	• Data must be generated using at least one lot of the device to evaluate the tolerance to anticipated shipping conditions.
	
	• These may be real or simulated studies and shall include extreme variations in temperature.
	
	• Manufacturers must submit:
	  - The study report (including the protocol, acceptance criteria);
	  - The method used for simulated conditions and;
	  - The conclusion and recommended shipping condition.
	
	• Packaging validation data should be submitted to demonstrate how the device complies with GSPR 11.5.

Sterilisation	If the device or aspect(s) of the device include sterilisation, the manufacture must submit the validation protocol(s) and report(s) including a description of the method(s) used. The validation report(s) shall address packaging, sterilisation and maintenance of sterility as well as bioburden testing, pyrogen testing and, if applicable, testing for sterilant residues.
Declaration of conformity	The EU Declaration of Conformity should include all of the information listed in IVDR Annex IV. For initial applications, the copy of the declaration of conformity that is submitted should be unsigned.
Additional information required in specific cases	In the case of devices containing tissues, cells and substances of animal, human or microbial origin, the submission should include information on the origin of such material and on the conditions in which it was collected (e.g., inactivation of attenuated viruses). Refer to IVDR EU 2017/746 Annex II, 6.5.

Companion Diagnostics

In addition to performing the technical documentation assessment laid down in sections 4.1 to 4.8 of Annex IX, for companion diagnostic devices, BSI must consult the authority who is responsible for the authorisation of the concerned medicinal product(s) (Annex IX, section 5.2(c)). For medicinal products authorised through the centralised procedure, BSI will consult the European Medicines Agency (EMA).

EMA has published important information regarding the CDx consultation process on its **website**. BSI strongly recommends that manufacturers review this information carefully before submitting technical documentation to BSI for companion diagnostic devices. **Here** you can find the following:

- **Guidance Document:** Guidance on the procedural aspects for the consultation to the European Medicines Agency by a Notified Body on companion diagnostics.

- **EMA Q&A:** Questions & Answers - Practical arrangements on the companion diagnostics consultation procedure to the European Medicines Agency by Notified Bodies.
    - Letter of Intent Template.
    - CDx Consultation Application Template.
    - CDx Consultation - Assessment Report Template.
    - List of consultation procedural timetables.

Devices classed as companion diagnostics:

- Must be essential in developing or generating the supporting information for the corresponding medicinal product.
- Must have a corresponding medicinal product. In some instances, a single device may be linked with multiple medicinal products (e.g., panel tests).

MDCG 2020-16 should be consulted as it provides clarification on the Annex VIII, rule 3(f) and examples of devices classified under this rule.

The technical documentation requirements for a companion diagnostic are the same as other devices. Additional requirements include:

The intended purpose of the device must indicate:

- That the device is a companion diagnostic (Annex II, section 1.1(c)(ii)).
- The relevant target population of the associated medicinal product(s) (Annex II, section 1.1(c)(ix)).
- The International Non-proprietary Name (INN) of the associated medicinal product for which it is a companion test (Annex I, section 20.4.1(c)(viii)).
- As a minimum, the draft summary of safety and performance and the draft instructions for use will be provided to the relevant Competent Authority (CA) or EMA to seek a scientific opinion. It is expected that the draft SSP will follow MDCG 2022-9- Summary of Safety and Performance Template. The IFU and SSP must contain enough information to allow the relevant CA or EMA to make a qualified assessment of the suitability of the CDx device for use with the concerned medicinal product(s).
- For EMA consultations, BSI must provide EMA with a Letter of Intent (LOI) three months before submitting the consultation application. Once the application is submitted, the consultation will follow the **timetables** published by EMA based on the submission date. BSI will only submit the LOI to EMA once the BSI Technical Specialist has closed all review questions or is highly confident that a positive conclusion will be met within the three-month timeframe.

Companion Diagnostics _- continued_	• An EU Technical Documentation Certificate will not be issued until a scientific opinion has been received from the relevant CA or EMA. • Additional resources may also be required for external independent reviews and/or software review.

Additional information IVD devices that incorporate Artificial Intelligence(AI)/Machine Learning (ML)

Description of the AI/ML model(s) incorporated in the system/device	Description of the intended use of the AI system, the intended users and operational environment (EN 82304-1). Description of AI system lifecycle (ISO/IEC 5338), including decisions on the model, algorithm selection and continuous validation.
Description of the datasets used in training/testing the AI/ML model(s)	• Data sources and collection processes (ISO/IEC 5259-4, ISO/IEC TR 24028, EN ISO/IEC 8183). • Data generation processes (for simulated data) (BS/AAMI 34971). • Data cleaning, filtering, processing, augmentation processes, by specifying methods and libraries employed and including how consistency between different data sources is guaranteed (e.g. for data obtained by different measurement methods). • Data labelling and annotation processes, including the competence of the labellers (and how that competence is achieved and maintained). • Dataset partitioning processes (ISO/IEC TR 24028, ISO/IEC TS 4213). • Description of features contained in dataset(s) (ISO/IEC TR 24027). • Size of dataset(s). • Data retention and storage processes, including dataset version control, mapping between models and datasets used to generate them.
Description of the processes, tools and environments used to train, test and deploy the AI/ML model(s)	• Hardware (screen size, screen resolution, memory, network connection, etc.) and software (e.g. operating system, browser, run-time environments) environments used for model(s) training (with attention to known vulnerabilities of the libraries employed). • Hardware (screen size, screen resolution, memory, network connection, etc.) and software (e.g. operating system, browser, run-time environments) environments used for model(s) testing (with attention to known vulnerabilities of the libraries employed).Hardware (screen size, screen resolution, memory, network connection, etc.) and software (e.g. operating system, browser, run-time environments) environments used for model(s) deployment (with attention to known vulnerabilities of the libraries employed).Methodology used for model training, including hyperparameter tuning and processes to ensure reproducibility of results. • Methodology used for model testing, including processes to ensure reproducibility of results.

Description of the processes, tools and environments used to train, test and deploy the AI/ML model(s) - *continued*	• Methodology used for model deployment, including information regarding how the model(s) behave if the inputs do not meet the specified requirements, availability and interoperability of the model(s), how failures of the system are detected and handled, and compatibility between training and deployment environments if applicable (including the cases in which different programming languages have been used for training/deployment). • Methodology of the change management plan, including but not limited to continuous learning, model re-training, trigger criteria, data sources for re-training. Description of how the AI model(s) accounts for the possibility that its predictions may influence user behaviour or system outcomes, and the mechanisms in place to monitor and mitigate feedback loops, if applicable, that could bias future predictions. • Description of the roles involved in the AI lifecycle, of the skills for each of such roles. Records of competence of personnel involved in the AI lifecycle (internal and external resources). • Methodology related to explainable AI techniques implemented to foster transparency and explainability of the model(s), if applicable.
AI/ML Risk Management	• Risks related to dataset quality, representativity and size. • Risks related to dataset collection and processing processes. • Risks related to choice of environments and methodologies for training, testing and deployment of models (including time constraints related to the speed at which the system must generate the outputs). • Risks related to model performance (with reference and comparison to state-of-the-art and clinical benefits), including bias/fairness, robustness (including expected value ranges for the model(s) outputs and validation of those ranges and confidence intervals within which performance metrics may vary), concept drift – with a description of how stakeholder requirements are translated into target performance specifications. • Risks related to AI transparency, autonomy, misuse, human oversight, trustworthiness and usability, including operational limits within which the model(s) operates, the factors that can have a negative impact on the quality criteria, and how the quality of the model's outputs is communicated to the user. • Risks related to AI-specific cybersecurity, including adversarial attacks, data poisoning. • Risks related to change management plan, including but not limited to continuous learning, model re-training, trigger criteria, data sources for re-training.

AI/ML Requirements	• Requirements related to dataset quality, representativity and size.
	• Requirements related to dataset collection and processing processes.
	• Requirements related to choice of environments and methodologies for training, testing and deployment of models (including time constraints related to the speed at which the system must generate the outputs).
	• Requirements related to model performance (with reference and comparison to state-of-the-art and clinical benefits), including bias/fairness, robustness (including expected value ranges for the model(s) outputs and validation of those ranges and confidence intervals within which performance metrics may vary), concept drift – with a description of how stakeholder requirements are translated into target performance specifications.
	• Requirements related to AI transparency, autonomy, misuse, human oversight, trustworthiness and usability, including operational limits within which the model(s) operates, the factors that can have a negative impact on the quality criteria, and how the quality of the model's outputs is communicated to the user.
	• Requirements related to AI-specific cybersecurity, including adversarial attacks, data poisoning and further risk sources, and security lifecycle.
	• Requirements related to the change management plan, including but not limited to continuous learning, model re-training, trigger criteria, data sources for re-training.
AI/ML Verification and Validation	• V&V related to dataset quality, representativity and size.
	• V&V related to dataset collection and processing processes.
	• V&V related to choice of environments and methodologies for training, testing and deployment of models (including time constraints related to the speed at which the system must generate the outputs).
	• V&V related to model performance (with reference and comparison to state-of-the-art and clinical benefits) including bias/fairness, robustness (including expected value ranges for the model(s) outputs and validation of those ranges and confidence intervals within which performance metrics may vary), concept drift – with a description of how stakeholder requirements are translated into target performance specifications.
	• V&V related to AI transparency, autonomy, misuse, human oversight, trustworthiness and usability, including operational limits within which the model(s) operates, the factors that can have a negative impact on the quality criteria, and how the quality of the model's outputs is communicated to the user.
	• V&V related to AI-specific cybersecurity, including adversarial attacks, data poisoning and further risk sources, and security lifecycle.
	• V&V related to the change management plan, including but not limited to continuous learning, model re-training, trigger criteria, data sources for re-training.

Appendix B

Reference Documents

Note: Guidance related to IVDR issued by MDCG and other entities is evolving at a rapid pace. These links are intended for reference only. Please ensure that the latest version of the documents is used. Gaps with the IVDR have not been assessed for each guidance, but guidance documents are included here for general additional information on specific topics. The following is not an exhaustive list and other relevant guidance documents not listed below may be available under each subject/topic.

> **Change reporting**
>
> NBOG's Best Practice Guide 2014-3, "Guidance for manufacturers and Notified Bodies on reporting of Design Changes and Changes of the Quality System"

Regulatory Guidance Organizations

EU Commission New Regulations Guidance

EU Commission Directives Guidance

EU Commission Manufacturer IVD Guidance

MDCG guidance

NBOG (Notified Bodies Operational Group) **guidance**

Team-NB guidance

CAMD (Competent Authorities for Medical Devices)

IMDRF (International Medical Device Regulators Forum)

Specific Topic Guidance

Quality management Systems Guidance

EN ISO 13485 - Medical devices - Quality management
systems - Requirements for regulatory purposes.

Risk Management Guidance

EN ISO 14971 - Medical devices - Application of risk management to medical devices.

Standards

- The EU Commission Implementing Decision on IVD harmonised standards was published on 24 March 2020.

- BSI Online Standards.

- ISO Online Standards.

Shelf-life

ICH Guidelines Q Series.

Transit testing

ISTA guidelines.

Software guidance

- **MDCG 2019-11** - Guidance on Qualification and Classification of Software in Regulation (EU) 2017/745 – MDR and Regulation (EU) 2017/746 – IVDR.

- **UDI requirements -** for standalone software that are IVDs in their own right.

Self-tests

- **EN 13532** General requirements for in vitro diagnostic medical devices for self-testing.

- **ISO 15197** In vitro diagnostic test systems - Requirements for blood-glucose monitoring systems for self-testing in managing diabetes mellitus.

- **ISO 17593:2022** Clinical laboratory testing and in vitro medical devices - Requirements for in vitro monitoring systems for self-testing of oral anticoagulant therapy.

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