This checklist is **ONLY** intended for use with *terminally sterilized devices in their final packaging applying H2O2 sterilization*. Please use the alternative checklists for H2O2 sterilized re-processable devices ([MED\_T\_09.82](https://roxtra.tuev-sued.com/Roxtra/doc/showfile.aspx?FileID=208228)) or generalized / non-standard sterilization methods ([MED\_T\_09.80](https://roxtra.tuev-sued.com/Roxtra/doc/showfile.aspx?FileID=208224)). Please request a current copy from your TÜV SÜD Product Service primary contact.

|  |
| --- |
| **Application ID (as it appears in the application form / change notification form)** |
|  |

* [X] in this document indicates a document to be named including page number – submitted for evidence. Grey text (for guidance) may be replaced/deleted.
* In case of a Change Notification, please only fill in the applicable sections.

# Short Product Description relevant for H2O2 Gas Plasma Sterilization

*Note: Please replace grey italic text with respective information*

|  |
| --- |
| **Short description incl. picture of the device** - in case of changes, as far as relevant |
| Description of the device as far as relevant for sterilization (pictures for clearer understanding):  *To be added*  *Product Schematic and / or Photo of product, size, material, Intended Use / Intended Purpose according to IFU (inclusive total application duration, body contact, implantable, patient group), Packaging description, Picture*  Variants under assessment:  *To be added*  *Product variants (e.g. Same product in different SBS, Multiple products in same SBS)*  *Description of the Sterile Barrier System Specifications used at sterilization*   * *What is the representative / worst-case SBS for the product under assessment?* |

|  |  |
| --- | --- |
| **Manufacturing facility and certification status of the applicable sterilization sites / facilities** | |
| *(Product) Manufacturing site(s) to be named* | *Please provide the applicable QMS Certificate 13485 of all applicable manufacturing site(s), if not already listed on the certificate.* |
| *Sterilization site / Validation contractor* | *Please provide the applicable QMS Certificate 13485 of the used sterilization site*  *In case of identical laboratory subcontractor (e.g. residual analysis, microbial testing) please additionally provide ISO 17025 certificate including respective scope.*  *In case the sterilization site and the H2O2 sterilization study provider are not identical, please provide respective information for all involved parties.* |
|  |  |

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| **External laboratories if used for sterilization validation and certification status of the laboratory** | |
| *Name of the laboratory* | *Please name the test done by the laboratory (e.g. Microbiology BI testing, Sterility testing, Bioburden, Residuals). Please provide the applicable QMS Accreditation Certificate (e.g. ISO 17025 or GLP)* |
| *Name of the laboratory* | *Please name the test done by the laboratory (e.g. Microbiology BI testing, Sterility testing, Bioburden, Residuals). Please provide the applicable QMS Accreditation Certificate (e.g. ISO 17025 or GLP)* |
|  |  |

# Production related Information

## Used Hardware Specifications

*Note: Please replace grey italic text with respective information. Please add additional lines if required.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Equipment including Identifier (e.g. int. ID/ serial number)** | **Site / Location** | **Applicable cycle operated by the equipment for the device in question** | **Typical load configuration** | **Usable chamber volume in m3** | **All sensors / measurement devices (internal + external sensors, dataloggers for validation) are calibrated** |
| *e.g. Super H2O2 Plasma* | *Inhouse or external source* | *Please name the cycle and Version/ Revision of cycle*  *e.g. FAST & CLEAN*  *please list ALL cycles that are used together with the product* | *e.g. Flexible Endoscope / Central Sterilization mixed load* | *5,4* | Yes  No |
|  |  |  |  |  |  |

*Notes:*

* *Sensor calibration and equipment maintenance need to cover all critical sensors, e.g. optical / spectral detector for H2O2 as in-process monitor.*
* *Sterilizer equipment used for the validation must be CE certified by a European Notified Body. In any other case a full sterilizer equipment design documentation needs to be submitted to be reviewed additionally.*

|  |  |
| --- | --- |
| **Sterilizing agent definition** | |
| *Clear identifier, e.g.*  *H2O2 prefilled cartridge* | *Further details on the sterilizing agent presentation: Half-Dose cartridge, Booster, 3rd party cartridge, fill volume, sample picture, REF Code or order code from supplier, other unique identifier, certificate of conformity or certificate of analysis*  *In case during validation the H2O2 is manually injected (e.g. by syringe) into the*  *process chamber, please provide above data for the separately sourced H2O2 bottle and how the H2O2 is considered to be equal / comparable to the routine H2O2 in*  *cartridges.*  *Above information may be used as guidance and not each individual point may be available for the individual submission.* |
|  |  |

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| --- |
| **Accessories & Components as part of the validation and routine processing** |
| *Please list all accessories and components that are to be used in preparation and/or inside the sterilization chamber for the validation activities and also for intended routine sterilization.*   * *ExtraDeep Instrument Tray* * *CompatibleTRAY Instrument Tray* * *SuperFoil Sterilization Wrap* * *Ultra PRECISE Chemical indicator Tape* |

|  |
| --- |
| **Biological Indicator (BI) / Process Challenging Device (PCD) description** |
| *Minimum expected level of information:*   * *Detailed description of the BI (carrier material, dimensions, microorganism, population, D-Value (H2O2), survival/kill window, dose/response characteristics, adherence to EN ISO 11138-1, Certificate of Analysis, Certificate of Compliance)  In case it is deviated from the standard microorganism Geobacillus stearothermophilus, a full investigation study (including scientific data) needs to be provided to demonstrate equal or higher resistance.  If biological indicator is not sourced from a certified supplier (e.g. manufactured by internal microbiology lab), then a full design documentation of the BI manufacturing process needs to be added to the documentation or separately covered by a supplier audit of this manufacturing process.* * *Detailed description of the PCD (picture / drawing, placement of BI inside PCD, inoculation with spore suspension)* * *Is the used ePCD available in the market to the commercial end-user? If not, how is the correlation (e.g. D-Value, resistance characteristics) between the publicly available ePCD (for routine release) to the custom ePCD within this validation achieved?* |

## If Applicable: Cleaning of Product in Manufacturing before Sterilization

*Note: Please replace grey italic text with respective information. Please add additional lines if required.*

|  |  |
| --- | --- |
| **Cleaning process description** | |
| Are cleaning parameters that are specific for the medical device defined? | yes documented in *[X,p.y]*   no *please justify:*  Please describe the cleaning process:  *Parameters of the cleaning process may be specific load configuration, positioning, connection, accessories, process chemicals, pressures or temperature limit(s)…* |
| Have cleaning studies been performed in validation of the used equipment to approve the respective cleaning process step is able to deliver appropriate performance? | yes documented in *[X,p.y]*   no *please justify:*  *Cleaning studies shall reflect the potential contamination and evidence of reproducible elimination of the contamination to a safe level (see EN ISO 17664)* |
| Are (cleaning) process residuals within limits? | yes documented in *[X,p.y]*   no *please justify:*  *Residuals like endotoxins, particles, org. inorganic contaminations, detergent residues with adequate risk related to the device and body contact shall be safe and acceptable.* |
| Are preventive maintenance operations defined including frequencies? | yes documented in *[X,p.y]*   no *please justify:*  *Examples for preventive maintenance are: exchange of cleaning media and/or equipment* |
| Residual water / cleaning agent impact on H2O2 gas plasma sterilization in vacuum | *Please specify maximum allowable limits for residual water / residual cleaning agent on the device-to-be-sterilized that could adversely affect the subsequent sterilization cycle.*  *Only applicable if no disinfection step follows this cleaning step. Otherwise refer to the same question in the next section 2.3* |

## If Applicable - Disinfection of Product in Manufacturing before Sterilization

*Note: Please replace grey italic text with respective information. Please add additional lines if required.*

|  |  |
| --- | --- |
| **Disinfection process description** | |
| Are parameters that are specific for the medical device defined, such as specific load configuration, positioning, connection, accessories, process chemicals, pressures or temperature limit(s)? | yes documented in *[X,p.y]*   no *please justify:*  Please describe the disinfection process:  *Parameters of the disinfection process may be specific load configuration, positioning, connection, accessories, process chemicals, pressures or temperature limit(s)…* |
| Were disinfection studies performed in validation of the used equipment to approve the respective disinfection process step is able to deliver appropriate performance? | yes documented in *[X,p.y]*   no *please justify:*  *Disinfection studies shall reflect the potential contamination and evidence of reproducible elimination of the contamination to a safe level (see EN ISO 17664)* |
| Are process residuals within limits? | yes documented in *[X,p.y]*   no *please justify:*  *Residuals like endotoxins, particles, org. inorganic contaminations, detergent residues with adequate risk related to the device and body contact shall be safe and acceptable.* |
| Are preventive maintenance operations defined including frequencies? | yes documented in *[X,p.y]*   no *please justify:*  *Examples for preventive maintenance are: exchange of disinfection media and or equipment* |
| Residual water / cleaning & disinfection agent impact on H2O2 gas plasma sterilization in vacuum | *Please specify maximum allowable limits for residual water / residual cleaning & disinfection agent on the device-to-be-sterilized that could adversely affect the subsequent sterilization cycle.* |

## Only applicable to *Change* of Clean Room Control / Validation

*Note: Please replace grey italic text with respective information. Please add additional lines if required.*

|  |  |
| --- | --- |
| Cleanroom | *Please identify the cleanroom(s) where the manufacturing takes place, including ISO classification* |
| Are action and alert levels/limits set appropriately for the subsequent product bioburden in cleanroom processes? | yes documented in *[X,p.y]*   no *please justify:*  Acceptance criteria for “in operation” condition:  Airborne particles [*size*]: particles/m3  Airborne microbiological contamination: cfu/m3 *(and/or settle plates)*  Surface microbiological contamination: cfu/ surface area  Product bioburden: cfu *(type – spores, fungi, anaerobe, bacteria) The bioburden shall be known to a degree to make decisions on resistance* |
| Monitoring points are defined for the above-mentioned measurements | yes documented in *[X,p.y]*   no *please justify* |
| Was IQ, OQ, PQ of the cleanroom successfully established? | yes documented in *[X,p.y]*   no *please justify:* |
| Is all measuring equipment in a calibrated state? | yes documented in *[X,p.y]*   no *please justify:* |
| Are utilities and media under surveillance | yes documented in *[X,p.y]*   no *please justify:*  *Please specify what media and related acceptance criteria are defined.*  *e.g. for water, compressed air…* |
| Are environmental parameters defined: | yes documented in *[X,p.y]*   no *please justify:*  Please specify - where applicable:  Temperature:  Humidity:  Pressure gradient/Pressure level at each room:  Air exchange rates:  Recovery time: |

## Cycle Specification

*Note: Please replace grey italic text with respective information for inhouse and outsourced processes. Please add additional lines if required.*

**Please paste copy of the cycle specification used at *routine* sterilization:**

|  |
| --- |
| *Please paste or reference [X] cycle specification here*  *In case of using a different set of parameters for the process validation, please explain the differences in detail and provide a rationale for the deviation (see also section 2.8. for validation cycle specifications).*  *In case only pre-defined sterilization programs / cycles can be selected by the end-user, please provide a rationale and reference to the cycle descriptions in the equipment manufacturer’s manual.* |

|  |  |
| --- | --- |
| Is re-sterilization allowed? | Yes  *Please state the maximum number of allowed re-sterilizations of the product or product family under assessment.*  *How was this maximum number of possible re-sterilization cycles determined? Is a study available that supports this value?*  No, *please justify* |
| Was product functionality and residual limits verified after maximum amount of allowed sterilization cycles | *Besides product functionality testing please also consider the possible amount of H2O2 (or other) process residues after maximum amount of re-sterilization cycles.*  Yes, documented in *[x]*  No, *please justify*: |

## Basic Validation Development Data

*Note: Please replace grey italic text with respective information.*

|  |  |
| --- | --- |
| Validation Method | Overkill half cycle / partial cycle approach (EN ISO 14937 Annex D / Approach 3)    BI and bioburden (EN ISO 14937 Annex C / Approach 2)    Bioburden (EN ISO14937 Annex B / Approach 1)    Product adoption to an existing cycle:  *Please assure that the adoption rationale and MPQ/PPQ validation data are submitted for the predicate device. This data is documented in [X]*    Other: *Please specify and add rationale for not using a standardized validation approach* |
| Validation related Procedures | Procedures to be included as part of the submission:    How new product will be added to a sterilization cycle- *is documented in [X]*    By what events a new validation is triggered and what step of validation has to address what type of measurements - *is documented in [X]*  *Please provide the review interval of data, and interval of time till repeat MPQ PPQ studies. When was the last MPQ, PPQ study executed?*  *What are further criteria that trigger a revalidation study (e.g. Product changes…)?*  *Is a routine interval specified (e.g. annual requalification)?*    How new equipment/process will be qualified/validated - *is documented in [X]*  What significant changes related to sterilization will be notified to the Notified Body - *is documented in [X]*  Validation protocol for the actual sterilization cycle including acceptance criteria - *is documented in [X]* |

## PPQ Physical Performance Qualification

*Note: Please replace grey italic text with respective information for inhouse and outsourced processes. Please add additional lines if required.*

|  |  |
| --- | --- |
| Please specify the validation load configuration: | Please specify the load used during validation at PPQ and MPQ:  *Please consider min and max configuration in case of widely varying load configurations, scheme of total load), number of BIs, number of Sensors , scheme of position of BIs, total load volume, density, amount of adsorptive material. The data is documented in [X]* |
| Please specify which product was used in the load: | The product is the same as in section 1   yes     no *– Please provide a description and justification* |

*Note:*

* *Please include additional information on how the used load / dummy load is representative for the expected routine load configuration*

## MPQ

*Note: Please replace grey italic text with respective information for inhouse and outsourced processes. Please add additional lines if required.*

**Please paste copy of the cycle specification used at *validation* of sterilization MPQ (e.g. half-cycle / partial cycle):**

|  |
| --- |
| *Please paste or reference [X] here. Cycle record summaries are documented in [X]*  *If identical to routine cycle as described / referenced in section 2.5, please specify.* |

|  |  |
| --- | --- |
| **MPQ Processing - Microbial Performance Qualification** | |
| Worst-case sterilizer conditions met? | *Please explain, how the worst-case sterilizer process limits have been challenged (e.g. using H2O2 cartridge at end-of-shelf-life, highest tolerable process pressure, lowest plasma power). Please only consider parameters, that are changeable by the equipment end-user. If pre-defined cycle programs & parameters are unchangeable by the end-user only maximum possible load configuration is considered relevant.*  *This ensures that the sterilizer equipment, operating at the lower process limits, is still capable of achieving an SAL<10-6 in the chosen cycle for the device-under-test.* |
| Placement scheme of BI and/or PCD within the load and in/on the actual device | *Please provide detailed information where the BI / spore inoculation / PCD placement in or on the medical device is done, including a rationale (e.g. longest lumen, difficult to reach crevice, high absorbent material, high surface roughness, materials that catalytically dissociate H2O2 on the surface, etc.).*  *Additionally, please provide the placement of BI/PCD within the chamber load to resemble routine conditions (load release).* |
| BI incubation conditions  (Reduced Incubation Time RIT) | *If incubation duration is less than 7 days, please provide a reduced-incubation-time (RIT) study in a representative load (no manufacturer study in a BIER vessel) to substantiate the incubation time [X].* |
| BI results including culture conditions and time between end of cycle and BI testing | BI results including culture conditions and time between end of cycle and BI testing is documented in *[X]* |
| Confirm resistance hierarchy from least resistant (natural product bioburden) < IPCD <= ePCD (most resistant) | sublethal / reduced cycle for BI resistance was performed and is documented in [X]  Data on the relationship of the resistance between ePCD, iPCD, worst-case Products, natural Bioburden is provided and is documented in [X]. |
| Material-dependent microbial resistance | *Please state how material-dependent microbial resistance is covered during the validation activity? It is well-known, that different material surfaces exhibit large variability in microbial inactivation time. Please consider the following*   * *What would be the worst-case material with respect to the sterilizing agent?* * *Is this material covered / included by the validation activity?* * *How is the material covered (e.g. direct inoculation on the actual device, BI using this material as carrier material, representative worst-case inoculated dummy material, etc.)* * *Has this been pre-established by the equipment manufacturer in an internal study that could be referenced / audited?* |
| Pre-sterilization Bioburden | *Please specify the bioburden level and acceptance limits e.g. with respect to bacteria, yeast/molds and anaerobic bacteria (were these investigations at least part of the initial assessment of bioburden?).*  *Please provide the bioburden trending data as a summary of the past two (2) years, if not available at least for the validation LOT plus a rationale (e.g. manufacturing occurs only intermittently = twice per year).* |
| Is endotoxin testing applicable for the device under assessment? | no   yes [X,p.y]*Please specify the method and related results. The data is documented in [X].* *(e.g. in case of direct contact to blood, CNS, eye or other systemic exposure)*  *If endotoxin monitoring is not required / not executed, please provide a detailed rationale.* |

**Please assure that the following phases and process values and tolerances are part of the overall validation requirement.**

*Please be aware that the below parameter-list is not exhaustive to cover the cycle and load types but are often omitted causing deficiencies and are therefore specifically requested.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Phase** | **Acceptance criteria: values and tolerance** | **Results measured and within tolerances**  **EN ISO 14937:2009 item 9.4.4** | **Comments if needed** |
| Total Cycle time | *Min / Max running time* | *(best provided in a table showing setpoint/tolerances against measured data)* |  |
| Chamber wall temperature | *Min / Max. temperature* | *See above* |  |
| Diffusion time | *Min / Max diffusion time of the sterilizing agent* | *See above* |  |
| Plasma time | *Min / Max. plasma running time* | *See above* |  |
| Plasma pressure | *Min / Max. allowed pressure during the plasma phase* | *See above* |  |
| Plasma power | *Min / Max. allowed plasma power* | *See above* |  |
| No. of injections per cycle | *Exact number of H2O2 injections into the chamber* | *See above* |  |
| Estimated H2O2 concentration within the sterilizer chamber at dwell phase | *~ xxx   mg/liter* | *See above* |  |
| Total H2O2 Injection volume for all injections | *~ 5 x 10g / ml* | *See above* |  |

*Note:*

* *Please provide above table for each cycle that is to be considered. In this case, please copy above table and fill out the fields for each individual cycle.*
* *A reference to the detailed cycle specification in the documentation is also possible.*

# H2O2 Residuals (EN ISO 10993-17)

*Note: Please replace grey italic text with respective information for inhouse and outsourced processes. Please add additional lines if required.*

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  | **Comments** |
| Is a rationale provided for selection of representative sample(s) | Yes, documented in *[X]* | No, *please justify*: | *To be added if any* |
| Are the applicable Allowable limits for H2O2 residuals specified (including max. re-sterilization cycles) and confirmed for the product in question considering the patient population provided  e.g. by TCL, TI, TTC, | Yes, documented in *[x]* | No, *please justify:* | *To be added if any* |
| Results and Test method provided  *Method qualification can be supported by ISO 17025 certificate of an accredited laboratory.* | Yes, documented in *[x]* | No, *please justify:* | *To be added if any* |

# Routine Processing

*Note: Please replace grey italic text with respective information*

|  |  |
| --- | --- |
| **Routine Processing** | |
| Routine release | BI and Physical load parameters  *Placement scheme and number of BIs, Certificate of BI or spore suspension*  BI incubation time 7 days / 14 days?  *If incubation duration is less than 7 days, please provide a reduced-incubation-time study in a representative load (no manufacturer study in BIER vessel) to substantiate the incubation time [X].*  Parametric release strategy provided in document [X]  *Please provide a detailed parametric release investigation in order to demonstrate process robustness within the key process parameters, including the clear definition of tolerances / tolerance bands for each of the key process parameter. The study is presented in document [X]* |
| Placement scheme and number of BIs, BI certificate provided? | Yes, documented in *[x]*  No, *please justify:* |
| Load configuration | Dedicated load  *Product configuration is fixed in number and location within chamber*  Mixed load  *different products allowed*  Please add information on min/max load variation, if applicable: |
|  |  |

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| **Release by client:** | | | | |
|  |  |  |  |  |
| **Date** |  | Signature |  | Full Name |
|  |  |  |  |  |
|  |  |  |  | Name of Legal Manufacturer |

*Note as to the signature’s relevance: If this document is officially signed, the provided rationales and data herein can be officially used by the reviewer. Otherwise, only the referenced documents can be used as evidence.*