



BSI Standards Publication

Cleanrooms and associated controlled environments — Biocontamination control

National foreword

This British Standard is the UK implementation of EN 17141:2020. It supersedes BS EN ISO 14698-1:2003 and BS EN ISO 14698-2:2003, which are withdrawn.

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A list of organizations represented on this committee can be obtained on request to its committee manager.

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Cleanrooms and associated controlled environments - Biocontamination control

Salles propres et environnements maîtrisés apparentés
- Maîtrise de la biocontamination

Reinräume und zugehörige Reinraumbereiche -
Biokontaminationskontrolle

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Contents		Page
European foreword		5
Introduction		6
1	Scope	8
2	Normative references	8
3	Terms and definitions	8
4	Establishment of microbiological control	11
4.1	General.....	11
4.2	Establishing a formal system for microbiological control	11
4.3	Microbiological contamination control system quality attributes	12
4.4	Identification of all potential sources and routes of microbiological contamination.....	12
4.4.1	General.....	12
4.4.2	Sources of microbiological contamination	13
4.4.3	Routes of transfer of microbiological contamination.....	13
4.5	Risk assessment.....	14
4.6	Establishment of microbiological environmental monitoring plan.....	14
4.6.1	General.....	14
4.6.2	Monitoring locations.....	14
4.6.3	Monitoring frequencies	14
4.7	Establishment of alert and action limits.....	15
4.8	Establishment of documentation system	15
4.9	Personnel education and training	15
5	Demonstration of microbiological control	16
5.1	Trending.....	16
5.2	Verification of the formal microbiological control system	16
5.2.1	General.....	16
5.2.2	Out of specification (OOS) investigation.....	16
5.2.3	Records	16
5.2.4	Sample tracking.....	17
5.2.5	Integrity of results	17
5.2.6	Data recording.....	17
5.2.7	Data evaluation.....	17
5.2.8	Trend analysis.....	18
6	Microbiological measurement methods	18
6.1	General.....	18
6.2	Choice of sampling method.....	18
6.3	Volumetric air samplers.....	19
6.4	Culture media and incubation.....	19
6.5	Incubators.....	19
Annex A (informative) Guidance for life science pharmaceutical and biopharmaceutical applications		20
A.1	Introduction.....	20
A.2	Risk/impact assessment.....	21
A.3	Demonstrating control.....	21
Annex B (informative) Guidance for life science medical device applications		22

B.1	Introduction	22
B.2	Risk assessment	22
B.2.1	General	22
B.2.2	Example 1: Sterile - terminal sterilisation is possible from a packaged product	24
B.2.3	Example 2: Sterile – No terminal sterilisation is possible due to product properties.....	25
B.2.4	Example 3: Non-sterile products.....	25
B.3	Establishing Microbiological Control	26
B.3.1	Microbiological contamination limits.....	26
B.3.2	Additional microbiological control considerations	27
B.4	Demonstrating microbiological control	27
B.4.1	Enumeration as part of measurement methods (Clause 6)	27
B.4.2	Methods for sampling	27
B.4.3	Microbiological Environmental Monitoring (EM) plan.....	27
B.5	Other informative annexes for Medical Device applications.....	29
Annex C (informative)	Guidance for healthcare/hospital applications.....	30
C.1	Introduction	30
C.2	Establishing control in a healthcare/hospital application.....	30
C.3	Risk assessment for operating room hospital applications.....	30
Annex D (informative)	Guidance for food applications	31
D.1	Introduction	31
D.2	Establishment of microbiological control	31
D.3	Microbiological cleanliness levels for monitoring	32
D.4	Demonstration of microbiological control.....	33
D.5	Example for food manufacture	33
Annex E (informative)	Guidance on culture based microbiological measurement methods and sampler verification.....	35
E.1	General	35
E.2	Air sampling	35
E.2.1	Volumetric air samplers.....	35
E.2.2	Settle plates.....	37
E.3	Surface sampling.....	37
E.3.1	General	37
E.3.2	Contact plates and strips.....	37
E.3.3	Swabs and sponges.....	38
E.4	Microbiological growth media	38
E.4.1	General	38
E.4.2	Media suitability (media sterility and ability to support growth).....	38
E.4.3	Media dehydration	39
E.4.4	Media disinfectant inhibition.....	39
E.4.5	Plate incubation	39
E.5	Validation of air samplers	39
E.5.1	General	39
E.5.2	Physical collection efficiency.....	39
E.5.3	Biological collection efficiency	40
E.6	Experimental method	40
E.6.1	Aerosol chamber method	40
E.6.2	Simplified laboratory method.....	42
E.6.3	Incubation	43
E.6.4	Collection efficiency calculations from testing results	43
E.6.5	Air sampler revalidation.....	44

Annex F (informative) Rapid microbiological methods (RMM) and alternative real time microbiological detection methods (AMMs)	45
F.1 General	45
F.2 Implementation of RMMs and AMMs	45
F.3 Validation of RMMs and AMMs	46
F.3.1 General	46
F.3.2 Acceptance criteria considerations	47
F.3.3 Verification test execution considerations	47
F.4 Action and alert levels	47
F.4.1 Setting action and alert levels	47
F.4.2 Result outside of action and alert levels	47
Bibliography	48

European foreword

This document (EN 17141:2020) has been prepared by Technical Committee CEN/TC 243 “Cleanroom technology”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2021, and conflicting national standards shall be withdrawn at the latest by February 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 14698-1:2003, EN ISO 14698-2:2003 and EN ISO 14698-2:2003/AC:2006.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Clean controlled environments are used to control and limit microbiological contamination where there is a risk to product quality, patient or consumer.

In this document the term “clean controlled environments” is used to cover cleanrooms, clean zones, controlled zones, clean areas and clean spaces.

This document gives guidance on best practice for establishing and demonstrating control of airborne and surface microbiological contamination in clean controlled environments. This document describes the requirements for microbiological contamination control and provides guidance on the qualification and verification of clean controlled environments.

In order to establish microbiological control, it is important to understand the risks of microbiological contamination. This is achieved by considering the sources of microbiological contamination, the associated microbiological concentrations and the likelihood of transfer and the impact on product quality, the patient or the consumer.

A formal system of microbiological control identifies, controls and monitors microbiological contamination on an ongoing basis. This is a process of continuous improvement and the principles of Plan - Do - Check - Act (PDCA) apply, as shown in Figure 1.

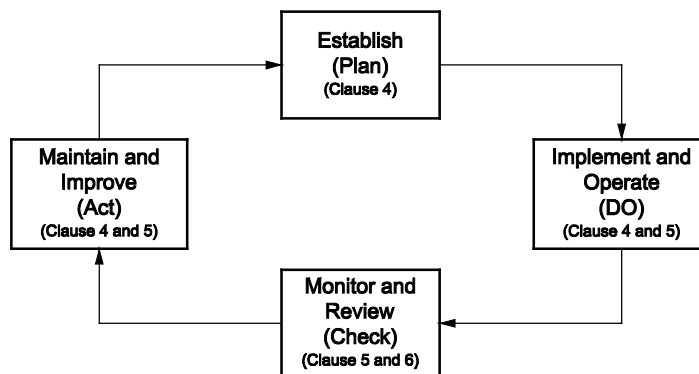


Figure 1 — Application of PDCA as the system for microbiological control

This document provides general guidance and considerations for a number of different applications. It is expected to have particular use in the Pharmaceutical, Biopharmaceutical, Medical Devices and other Life Science industries, as well as in Healthcare and Hospitals, Food, and related applications which use clean controlled environments.

In the regulated Pharmaceutical and Biopharmaceutical manufacturing sector there are already many applicable standards and regulatory guidelines. These include the EU Annex 1 GMP [31] guidance on the manufacture of Sterile Medicinal products and the FDA Aseptic Processing guidance [32]. The European and United States Pharmacopoeias also provide some guidance on certain related topics. There are numerous other documents and technical papers available from industry associations including the Parenteral Drugs Association (PDA), International Society of Pharmaceutical Engineering (ISPE) and Pharmaceutical Healthcare Sciences Society (PHSS). While there are regulations and standards on risk management of medical devices, for example EN ISO 14971 [2], there is less guidance on the microbiological control of clean controlled environments.

In the Healthcare and Hospital sector there are EU Directives, including the Tissue and Blood Directives for specialist and similar clean controlled environments. There are national standards and guidelines for specialised Operating Theatres, Isolation units, Immuno-compromised wards as part of infection

control. In addition, Hospital Pharmacy aseptic compounding units, Radiopharmacies and specialist laboratories such as Stem Cell typically refer to Life Science industry guidance documents.

In the Food and consumer related industries, while there are regulations and standards on food, beverages and cosmetics for example there is insufficient guidance regarding microbiological control in clean controlled environments.

This document includes a number of informative annexes that provide further guidance on biocontamination control in specific applications, and includes, for example:

- tables of microbiological cleanliness levels for monitoring of microbiological contamination in certain types of clean controlled environments;
- guidance in specific areas of microbiological control relating to the choice of environmental monitoring (EM) sampling methods, the management and trending of collected data and the role of alternative and real time microbiological detection systems;
- appropriate methods for establishing control, selecting appropriate alert and action levels and target levels as necessary;
- establishing a microbiological environmental monitoring plan as part of demonstrating control of the clean controlled environment.

1 Scope

This document establishes the requirements, recommendations and methodology for microbiological contamination control in clean controlled environments. It also sets out the requirements for establishing and demonstrating microbiological control in clean controlled environments.

This document is limited to viable microbiological contamination and excludes any considerations of endotoxin, prion and viral contamination.

There is specific guidance given on common applications, including Pharmaceutical and BioPharmaceutical, Medical Devices, Hospitals and Food.

2 Normative references

The following document is referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 14644-1:2015, *Cleanrooms and associated controlled environments — Part 1: Classification of air cleanliness by particle concentration (ISO 14644-1:2015)*

3 Terms and definitions

For the purposes of this document, biocontamination control and microbiological control are synonymous, and the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia. available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 action level

level set by the user in the context of controlled environments, which, when exceeded, requires immediate intervention, including investigation of cause, and corrective action

3.2 alert level

level set by the user in the context of controlled environments, giving early warning of a drift from normal conditions, which, when exceeded, should result in increased attention to the process

3.3 clean controlled environment

defined zone in which microbiological contamination is controlled by specified means