



# CTCB- Cleanroom Testing Course and Examinations (v1.12)

When a cleanroom has just been built, and during its lifetime, it is necessary to test it to ensure that it is working correctly. The amount and quality of air supplied, the air movement between and within cleanrooms, and the particle and microbiological counts in the cleanroom should be shown to be correct.

The testing of a cleanroom requires skill, and the following certified courses are provided to help acquire this. Teaching and certification is carried out by the CTCB, a board set up by the Scottish Society for Contamination Control (S2C2) as an education and training initiative to help fulfil the objectives of the Society. The CTCB Cleanroom Testing Advisory Board is composed of experts in cleanroom testing who oversee the content of the course, the teaching, and the examinations. An overview of the certification is as follows:

## Registration

Candidates can register for either of two levels of certification. These are:

**Professional certification:** For people whose profession is cleanroom testing, and who routinely test all aspects of cleanroom testing. These people are examined at the end of the course to see if they have a satisfactory knowledge of cleanroom testing. At the time of their final exam, they will have a minimum of 2 years' experience. If you apply, and have suitable qualifications, you will be required to:



- Study the self-study course notes that will be sent to you, attend a lecture course, and then pass a written examination on Cleanroom Testing;
- Attend a one day course on practical aspects of filter integrity and air volume and velocity testing, and hence be prepared for the practical exam;
- Pass a practical exam by demonstrating a high level of competence in (a) filter integrity testing and (b) measuring air velocities and volumes;
- Candidates who successfully pass the written and practical exams will be awarded a Professional Certificate.

**Associate certification:** For people who are familiar with aspects of cleanroom testing and wish to gain a fuller knowledge of the subject, or, have been working less than two years as a cleanroom tester, and wish to use the certification course as a basis of training to work towards professional status.

If you apply for the associate course, and have suitable qualifications, you will be required to:

- Study the self study course notes, attend a lecture course, and then pass a written examination;
- Attend a one day course on practical aspects of filter integrity, air velocity and volume measurement;
- Candidates who successfully pass the written exam will be awarded an Associate Certificate.

The written exams are identical in both qualifications, the difference between the two certificates is that professional candidates will have 2 years experience and are examined on their practical competence. In the associate qualification, the practical aspects will be taught, but not examined. Students who obtained the associate qualification may convert to a professional certificate once they have a minimum of two years experience, but they must pass the practical exam.

On registration, the candidate will receive self-study course notes, a questions and answers handbook, an example of a written exam paper, and notification of the date of the next examination. Prior to attending the

course and exams the professional candidates will be sent information on how the practical exam is run and the CTCB expectations. On satisfactory completion of the course, candidates receive a CTCB certificate, and are entered onto the CTCB 'List of successful candidates'. This registration applies to the person who passes the exam, and not their firm. A professionally-certified person will remain on the list for 5 years, at which time they must be re-certified.

## The Course Notes and Syllabus

The candidate will receive over 100 pages of course notes. Also issued is a handbook containing a set of questions (and answers) for each topic in the notes, so that the candidate can assess their knowledge. The syllabus of the course is as follows:



- Introduction to cleanroom testing;
- How a cleanroom air conditioning plant works;
- High efficiency air filters;
- Standards for classification and certification;
- Air supply and extract volumes;
- Differential pressures;
- Containment, visualisation and recovery tests;
- Air filter integrity tests;
- Particle measuring methods according to ISO 14644-1;
- Microbiological measurements;
- Cleanroom conduct.

## Revision Lectures, Practical Training and Examination

Candidates for the professional certification will attend for three days and receive practical training, a lecture revision course and sit practical and written examinations. The Associate candidates will attend for two days and receive practical training, a lecture revision course and sit a written exam. These days will be structured as follows:

*First day:* Practical training

*Second morning:* Revision lecture course

*Second afternoon:* Theory written exam

*Third day:* Practical exams (only for professional candidates)

The days will be organised as follows:



**First Day Practical Training:** This course will cover:

1. *Filter integrity testing.* Information will be given on an aerosol smoke generator and photometer, and how these are used to test filter integrity. The technique will be demonstrated and each student will have an opportunity to use the method.
2. *Air velocity and volume flow measurement.* Information will be given on how to carry out testing using an anemometer, hood capture method, averaging pressure flowmeter, and Pitot-static tube. The techniques will be demonstrated and there will be an opportunity for each student to use the methods.

**Second Day Revision Lecture Course:** A morning is spent at a lecture course revising the course notes.

**Second Day Theory Exam:** This will examine the candidate's knowledge of the course notes. The questions will be short and of the type that can be answered by no more than 10 words; no essays are required. The questions will be similar, or identical, to those given in the question and answers handbook. The pass mark is 50%.

**Third Day Practical Exam:** The professional candidates will be examined on their competence to carry out the following important tests:

1. Determine the average air velocity and uniformity, as well as the volume of air passing through a HEPA fan/filter unit by use of an anemometer. Measurement by use of the hood capture method must also be demonstrated.
2. Demonstrate that they can operate a smoke generator and photometer to find leaks in a filter and filter gasket.

The candidate will be required to competently write up reports on the results of the two tests.

The candidate's exam results are assessed by an Examination Board drawn from the CTCB Advisory Board. It is anticipated that about 70% of the candidates will pass their exams in the first attempt. The CTCB has an examination appeals procedure. Anyone failing an exam can re-sit it at the next examination. This can be done in the UK, or at another CTCB Cleanroom Testing certification course in Ireland and Sweden.

## **The Cost in the UK**

Costs are levied in two parts:

**Registration** for associate and professional candidates, which includes:

- being entered as a candidate;
- receiving a set of self-teaching course notes;
- receiving a questions and answers handbook;
- receiving a past exam paper;
- a certificate on satisfactory completion of the course.

The cost: £110 + VAT

### **Lecture course and exam**

**Professional three-day course** which includes:

- one-day practical training course
- a revision lecture course;
- written and practical exams.

**Cost:** £616+VAT.

**Associate two-day course** including:

- practical training course
- a revision lecture course;
- written exam.

**Cost:** £440+VAT

Coffee, tea and lunch over the course will be included in the cost.

### **Exam Re-sit**

Candidates can re-sit their exams. The cost will be £82+VAT for one exam and £164+VAT for the two. There is likely to be an opportunity every 6 months.

**Note:** Any costs required for accommodation and other meals are the responsibility of the candidate.

**For current information and costs please contact CTCB.**

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