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## Chalmers, CTCB-I and R3-Nordic invites to Cleanroom Testing and Certification Course 2024



**Date: 21-23 May 2024**

**Location:** Chalmers University of Technology, Department of Architecture and Civil Engineering, Sven Hultins gata 6, Gothenburg

### Scope

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 zones, the particle and microbiological counts in the cleanroom, and other attributes, should be shown to be correct.

The testing of a cleanroom requires skill, and the certification course described below is provided to help acquire and certify this. The teaching and the certification are carried out by the Cleanroom Testing and Certification Board – International (CTCBI), which is composed of international experts in cleanroom testing who oversee the content of the course, the teaching, and the examinations. This course is held in Sweden, the UK, Ireland, the Netherlands, Turkey and Belgium. See [www.ctcb-i.net](http://www.ctcb-i.net) for more information.

### Levels of certification

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

**Professional Level:** For people whose profession is cleanroom testing, and who routinely carries out all aspects of cleanroom testing. At the time of their exam they should have a minimum of 2 years' experience. If you apply for, and have suitable qualifications, you will be required to:



- study the course material that will be sent to you, attend a lecture course, and then pass a written examination on cleanroom testing
- pass a practical exam by showing a high level of competence in (a) filter integrity testing and (b) measuring air velocities and volumes and write adequate reports
- Complete a particle counting exercise

Note that certificates on Professional Level are valid for 5 (five) years. Recertification is required in order to maintain certification on Professional Level beyond five years.

**Associate Level:** For people who are either familiar with some aspects of cleanroom testing, and wish to gain knowledge about the subject (purchasers and evaluators of clean room testing), or have been working less than two years as a cleanroom tester, but wish to use the certification course as a basis of training and working towards professional status. If you apply for the associate course, and have suitable qualifications, you will be required to:

- study the course material that will be sent to you, attend a lecture course, and then pass a written examination on cleanroom testing
- attend a demonstration exercise on practical aspects of cleanroom testing

## Course material

The course material is based on a book, a Questions/Answers handbook and an example of a written exam. The material is intended for self-study prior to attending the lectures. The content of the course material, which are written in English, forms the basis for the lectures. *The course material will be delivered after payment of a registration fee, at latest one month before the start of the course.*

## Certification

As proof of the certification, a diploma will be issued to each participant who completes the course and passes the examination. The certification on the professional level is valid for 5 years, at which time re-certification is required in order to maintain certification on Professional Level.

## Schedule

### First Day - Lectures based on the course material

*Attendants:* Associate and Professional candidates

- Introduction to cleanroom testing
- The function of cleanrooms and air conditioning
- High efficiency air filters
- Standards for cleanroom classification
- Air supply and extract volume flows
- Differential pressures
- Containment, visualization and recovery tests
- Air filter integrity tests
- Particle measurements according to ISO 14644-1
- Microbiological measurements
- Cleanroom behavior and conduct





## **Second Day - Written Exam and Demonstration/Practical Training**

*Attendants:* Associate and Professional candidates

### *Written Exam*

This will examine the candidate's knowledge of the course material. 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 55%.

### *Demonstration/Practical Training*

- Filter integrity/leakage 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.
- Air velocity and volume flow measurement: Information will be given on how to carry out testing using various methods and instruments, for example anemometers, flow-hoods, Pitot-static tubes, etc. The techniques will be demonstrated and there will be an opportunity for each student to use the methods.
- Other test methods: Airborne particle counters, microbiological sampling and air flow visualization will be demonstrated and discussed.



## **Third Day Practical Exam**

*Attendants:* Professional candidates only

Each candidate will be required to show his/her ability to carry out the following two important practical tests (each test maximum 30 minutes):

- Determination of 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 and a flow-hood.



- HEPA-filter leak testing by the use of an aerosol smoke generator and a photometer.

The candidate will also be required to competently write reports on the two tests (each report maximum 30 minutes).

The exams will be marked separately for the two tests, i.e. air velocity/uniformity on one hand and filter leak testing on the other. Thus, it is possible to pass none, one or both exams. It is necessary to pass both exams to be certified on professional level.

The candidate will also be required to complete a written test on airborne particle counting and cleanroom classification according to ISO 14644-1.

The candidate's exam results are assessed by an Examination 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 a practical exam can "re-sit" it at the next examination within a year. This can be done in Sweden, or at another CTCB-I Cleanroom Testing Certification course in the UK, Ireland, and the Netherlands ([www.ctcb-i.net](http://www.ctcb-i.net)).

## Course fees 2024

### CTCB Associate Level - 2 days in Gothenburg

*Included:* Course material, lectures, written exam, practical demonstration and lunch both days.

Registration fee: SEK 4 500  
Course and exam fee: SEK 13 800

### CTCB Professional Level - 3 days in Gothenburg

*Included:* Course material, lectures, practical demonstration, written and practical exams, and lunch day 1 and 2.

Registration fee: SEK 4 500  
Course and exam fee: SEK 17 200

### Exam Re-sit and Upgrading from Associate to Professional Level – 1 day in Gothenburg

Candidates who do not pass a practical exam (filter leak testing and/or air velocity) can "re-sit" the exam within one year. Candidates who wish to upgrade their certificate from associate to professional level can complement with the practical exam within one year.

Registration fee: SEK 3 400  
Practical exams fee: SEK 4 000 per exam

### Recertification CTCB Professional Level - 3 days in Gothenburg

*Included:* Course material, lectures, practical demonstration, written and practical exams.

Registration fee: SEK 4 500  
Course and exam fee: SEK 14 300



**Note 1:** Candidates who are not already members of R3 Nordic or another ICCCS affiliated society will also be charged the cost of one year's individual membership - currently SEK 750 in R<sup>3</sup>-Nordic.

**Note 2:** VAT will be added to all prices given above.

**Note 3:** Any costs required for accommodation are the responsibility of the candidate.

## Further information and application

Further information is available at: [www.safetyventilation.com](http://www.safetyventilation.com)

[www.ctcb-i.net](http://www.ctcb-i.net)

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Application form is available here: <https://forms.office.com/e/FgMVgRsRx6>

***Latest application date 23 April 2024.***

**Cancellation Policy:** Cancellations must be made in writing and arrive at least one month before start of the course, so that the course fee, minus deductions of 500 SEK, will be refunded.

If canceled later, at least 14 working days before the start of the course, half of the course fee will be refunded.

If canceled later than 14 working days before the start of the course, no refund will be made.

Changes in applied certification level must be made in writing and are allowed no later than 14 working days before the start of the course. Otherwise no refund will be made.