

**The British Occupational Hygiene Society
Faculty of Occupational Hygiene**

**PROFICIENCY MODULE SYLLABUS
P403: ASBESTOS FIBRE COUNTING (PCM)**

Aim: To provide theoretical and practical knowledge in the techniques of fibre counting of asbestos air samples using phase contrast microscopy (PCM).

Learning Outcomes: Ability to describe the approved methods for correctly setting-up of air sampling equipment and for fibre counting and have an understanding of their limitations and the requirements for quality control.

Course Length: It is envisaged this course would be run over 2 days with ½ day for the course theory, 1 day for the course practical and a further ½ day for the examination/assessment

Content:	<i>Topic</i>	<i>Time Allocation</i>
	1 Setting up of Microscope	10%
	2 Filter Preparation and Fibre Counting	30%
	3 Calculation of Results and Quality Control	10%
	4 Practical Work	50%
	5 References	
	6 Examination / Assessment	

Note: Reference is made in this syllabus to HSE guidance and or documentation. This may not be the most up-to-date relevant publications from HSE/other sources and is intended as guidance for candidates only.

1 SETTING UP MICROSCOPE (10%)

Use of light microscopy, setting up of koehler or koehler type illumination, calibration of stage micrometer, test slides.

Describe the theory of phase contrast microscopy, with particular attention being paid to the microscope specifications outlined in the guidance material. Demonstrate and allow students to practice the use of the Walton Beckett graticule, stage micrometer and NPL test slide. Students must be given the opportunity to set up various makes of microscope used in this work as well as to count slides of known quality such as those used in the RICE scheme.

2 FILTER PREPARATION, FIBRE COUNTING & AIR SAMPLING EQUIPMENT SET-UP (30%)

Make students familiar with setting-up of air sampling equipment, the basic elements of sampling strategies, preparation of filters and counting of fibres in accordance with the recognised counting rules, the WHO method as specified in HSG248 (1). Discuss the limitations of the methods together with examination of accuracy, precision and systematic differences.

3 CALCULATION OF RESULTS AND QUALITY CONTROL (10%)

Examine the reliability of results in relation to quality control schemes such as UKAS, RICE and ISO and European Standards for GLP and internal schemes i.e. counting of blank filters and counting audits.

4 PRACTICAL WORK (50%)

Practical work must be carried out to provide the student with all practical knowledge in carrying out the following:

- microscope set-up
- slide preparation
- fibre counting for a range of fibre densities and types
- Set-up of air sampling equipment

5 REFERENCES

HSE Guidance HSG248 Asbestos: The Analyst's guide for sampling, analysis and clearance procedures

Suggested Further Reading:

Royal Microscopical Society Microscope Handbooks

- No 01 : An Introduction to the Optical Microscope, Savile Bradbury
- No 23 : Basic Measurement Techniques for Light Microscopy, Savile Bradbury

6 EXAMINATION/ASSESSMENT

There are two elements:

1. A 45 minute MCQ BOHS examination consisting of 30 questions, where each question answered correctly is worth 3 points, each wrong answer worth -1 point and an abstention worth 0 points. Points are then calculated as a percentage and it is necessary to obtain 50% to pass the written examination.

2. A practical assessment - conducted by a BOHS approved practical assessor who is independent of the course provider. This practical assessor will bring some elements of the assessment material as appropriate and the course provider is responsible for providing suitable facilities, including all safety provisions, for the practical assessment.

During the assessment, examination candidates may have access to any relevant reference material, excluding computers, palm tops and/or mobile phones, but will not be permitted to communicate with other candidates. Practical assessors are not allowed to discuss the results with candidates, and can exclude candidates from assessments for disruptive or unsafe actions.

The practical assessment examination comprises two or more elements:

- a one-to-one exercise between the candidate and the practical assessor, which will usually involve a practical exercise(s)
- other(s) will involve the candidate counting 8 slides, many formerly from the RICE scheme, provided to BOHS by HSL. The results will be assessed using a detailed marking schedule. It may be necessary for the practical assessor to interrupt candidates during this section in order to complete the one-to-one exercise.

The practical assessment will contain the essential elements as detailed below:

- A practical demonstration of the candidate's ability to set-up an air sampling pump (with a correctly mounted sampling head and clean filter) and the setting of a designated flow rate using a calibrated rotameter/ flowmeter.
- A practical demonstration of the candidate's ability mount filters, prepare slides and set up the microscope.
- Counting 8 slides, many formerly from the RICE scheme, and provided to BOHS by HSL. The results will be assessed using a detailed marking schedule.
- The candidate's ability to carry out all the relevant calculations and a working knowledge of the WHO counting method will be assessed.

Full details of the practical assessment requirements requirement are provided as a separate document GC.2 P403 Practical Requirements.

Successful completion of the above including at least an equivalent to RICE category B performance or better on all slides with a one slide exception will lead to a:

PROFICIENCY CERTIFICATE in ASBESTOS FIBRE COUNTING (PCM)