

The British Occupational Hygiene Society
Faculty of Occupational Hygiene

PROFICIENCY MODULE SYLLABUS

P403: ASBESTOS FIBRE COUNTING (PCM)

AIM: This module provides theoretical and practical knowledge in the techniques of fibre counting of asbestos air samples using phase contrast microscopy (PCM).

The module is at a proficiency level which must aim to provide the student with the practical knowledge and skills to be able to carry out the stated work.

In conjunction with the Proficiency Module P404 – Air Sampling and Clearance Testing for Asbestos, this will then cover the requirements of the '4-Stage Clearance procedure'.

CONTENT:

	TOPIC	TIME ALLOCATION
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%

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

NB: The Counting rules for the practical assessment will remain as those specified in MDHS 39/4 until such time as the change to the WHO method is agreed. Only then will HSG 248 apply.

1. SETTING UP MICROSCOPE (10%)

Use of light microscopy, setting up of kohler or kohler 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 and FIBRE COUNTING (30%)

Make students familiar with the preparation of filters and counting of fibres in accordance with the recognised counting rules, using those in MDHS 39/4 (1), the ERM and the WHO method as specified in HSG248 (2). (The WHO method will not be used for slide counting until an agreed date from HSE). 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

Educational Objectives

The student must be able to describe the approved methods for fibre counting and have a 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.

REFERENCES

- (1) HSE Guidance MDHS 39/4 (1995) Asbestos Fibres in Air. Sampling and Evaluation by Phase Contrast Microscopy (PCM) Under the Control of Asbestos at Work Regulations.
- (2) HSE Guidance HSG248 Asbestos: The Analyst's guide for sampling, analysis and clearance procedures

Suggested Further Reading

1. 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

COURSE EXAMINATION/ASSESSMENT

The students would be assessed as follows:

- A 45 minute MCQ BOHS examination (30 questions).
- A practical assessment carried out by the course provider as follows.

PRACTICAL ASSESSMENT - FIBRE COUNTING

Assessment must include:

- Practical demonstration of the candidate's ability to mount filters, prepare slides and set up the microscope.
- The candidate will count 8 slides 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.

Successful completion of the above and a RICE category A or B performance will lead to a:

'PROFICIENCY CERTIFICATE'
in ASBESTOS FIBRE COUNTING (PCM)