Level 3 Award in Asbestos Bulk Analysis

January 2020

Guided Learning 23 hours
Total Qualification Time 81 hours

Ofqual Qualification Number 601/8288/X

Description

The *Control of Asbestos Regulations* impose duties on every organisation who analyses samples for the identification of asbestos to be accredited by UKAS for this activity.

Laboratory analysts will need to be able to analyse and identify asbestos from within samples collected out on site in accordance with the procedures described in HSG248. The purpose of this qualification is to provide learners with the knowledge and understanding to be able to carry out this role in the workplace. Possession of this qualification by staff will help organisations and companies meet the accreditation criteria for ISO17025 (testing bodies).

The qualification is divided into three units:

Unit One: Asbestos types, uses, health effects and legislation

Unit Two: Theory and equipment used in asbestos bulk analysis

Unit Three: Perform bulk analysis of asbestos samples

Content:

Unit One: Asbestos Types, Uses, Health Effects & Legislation

Guided Learning: 4 hours
Total Unit Time: 7 hours
Unit Level: 3
Unit Reference No. R/507/9967

Summary of Learning Outcomes:

To achieve this unit a candidate must:

1. Understand the health risks, uses and properties of asbestos, *by being able to meet the following assessment criteria:*

1.1 State the properties and characteristics of different types of asbestos.
1.2 Review the types and uses of asbestos containing products.
1.3 Explain the risks to health of asbestos.

2. Know legislation relating to asbestos, *by being able to meet the following assessment criterion:*

2.1 Summarise legislation relating to the control and use of asbestos.

Content:

1 Understand the health risks, uses and properties of asbestos

1.1 *Properties and characteristics of the different types of asbestos:* Crocidolite (blue asbestos), chrysotile (white asbestos) amosite (brown asbestos), actinolite, anthophyllite and tremolite, to include fibre size and shape, biopersistence, friability and solubility.

1.2 *Types and uses of asbestos containing products:* Asbestos contents, extent of use, reasons behind use, different fibre properties and resistances, materials asbestos was used with: sprayed coatings; lagging; insulating boards; ropes and yarns; cloth; millboard, paper and paper products; asbestos bitumen products; asbestos cement products; flooring; textured coatings and paints; mastics, sealants, putties and adhesives; reinforced plastics; plugging compounds; domestic appliances, plant and machinery, asbestos contamination in other products.

1.3 *Risk to health:* Asbestos related diseases: mesothelioma; asbestosis; lung cancer; risk of developing disease, including risks from low level exposures; induction or latency periods; levels of exposure to asbestos fibres; purpose of, and reasons for, asbestos control limits, clearance indicator levels and peak exposure levels.

2 Know legislation relating to asbestos

2.1 *Legislation:* main points of the following Acts and Regulations that are relevant to asbestos **or any superseding legislation**; Health and Safety at Work etc. Act 1974, Management of Health and Safety at Work Regulations 1999, Control of Substances Hazardous to Health Regulations and amendments, Control of Asbestos Regulations 2012, Construction (Design and Management) Regulations 2015, Hazardous Waste (England & Wales) Regulations 2005, duties of employers in control of workplaces; legal status of Approved Codes of Practise, HSE regulations and guidance notes.

Unit Two: Theory and use of equipment for asbestos bulk analysis

Guided Learning: 8 hours
Total Unit Time: 18 hours
Unit Level: 3
Unit Reference No. T/507/9976

Summary of Learning Outcomes:

To achieve this unit a candidate must:

1. **Know how polarised light microscopy can be used in the identification of asbestos fibres**, *by being able to meet the following assessment criteria:*

    1.1 Describe the effect of polarised light on vitreous, crystalline and amorphous materials.
    1.2 State the features of asbestos fibres that allow them to be identified by polarised light microscopy.
    1.3 Identify equipment required for the identification of asbestos fibres by low power stereo and polarised light microscopy.
    1.4 Outline the use of refractive index liquids in asbestos analysis and describe the methods used for sample preparation

2. **Understand factors that may prevent the identification of asbestos fibres by polarised light microscopy,** *by being able to meet the following assessment criteria:*

    2.1 Explain how some materials can be mistaken for asbestos fibres by polarised light microscopy.
    2.2 Identify procedural errors that may result in failure to accurately identify asbestos fibres.
    2.3 Outline quality control procedures and limits of detection for the PLM method as described in HSG 248

3. **Know safety requirements for the use of polarised light microscopy in the identification of asbestos fibres**; *by being able to meet the following assessment criteria:*

    3.1 Outline procedures for maintaining safety during asbestos analysis.

Content:

1 Know how polarised light microscopy can be used in the identification of asbestos fibres

1.1 *Effect of polarised light on vitreous, crystalline and amorphous materials:* how polarised light can be used in the identification of vitreous, crystalline and amorphous materials by observations of colour, pleochroism, birefringence and signs of elongation and extinction; outline of physics governing polarised light and polarised light microscopy.

1.2 *Features of asbestos fibres that allow them to be identified by polarised light microscopy:* Identification of asbestos fibres by polarised light microscopy; colour, appearance, elasticity and morphology of different asbestos fibre types; how to recognise the hydrophobic and hydrophilic properties of asbestos fibres by polarised light microscopy.

1.3 *Equipment required for the identification of asbestos fibres by low power stereo and polarised light microscopy:* Types of microscopes and optics used, fume cabinets, hot plates, Class H Vacuum cleaners; reasons for use; standards required of equipment.

1.4 *Use of refractive index liquids in asbestos analysis and sample preparation techniques:* Use of these reagents for the identification of asbestos fibres; expected observations and results with different asbestos types; preparing samples by crushing, acid washing or treatment, use of organic solvents to remove bitumen or plastic matrices, low temperature ashing.

2 Understand factors that may prevent the identification of asbestos fibres by polarised light microscopy

2.1 *How some materials can be mistaken for asbestos fibres by polarised light microscopy:* other fibre types that may display similar properties to asbestos when observed by polarised light microscopy such as cob webs, leather, swarf, skin cells, polyethylene; difficulties with certain samples such as floor tiles and textured coatings; how the effect of heat such as fire damage to asbestos can affect identification.

2.2 *Procedural errors that may result in failure to accurately identify asbestos fibres:* inadequate sample size, non-homogenous and trace content samples, analyst fatigue, eye strain, detection limits, cross contamination during sampling and analysis, handling of samples.

2.3 *Quality control and quality assurance procedures, and limits of detection:* Internal quality procedures, UKAS requirements, sample storage, AIMS, appreciation that the method is qualitative and not quantitative; reporting restrictions on analytical reports.

3 Know safety requirements for the use of polarised light microscopy in the identification of asbestos fibres

3.1 *Procedures for maintaining safety during asbestos analysis:* use of fume cabinets to include flow rates and servicing of cabinets; glove boxes, safe use of chemicals for sample preparation, safe use of refractive index liquids.

Unit Three: Perform bulk analysis of asbestos samples

Guided Learning: 11 hours
Total Unit Time: 56 hours
Unit Level: 3
Unit Reference No. F/507/9978

Summary of Learning Outcomes:

To achieve this unit a candidate must:

1. **Carry out preparatory procedures for identifying asbestos fibres by polarised light microscopy,** *by being able to meet the following assessment criteria:*

    1.1 Prepare samples for polarised light microscopy.
    1.2 Set up a polarising microscope for use.

2. **Carry out polarised light microscopy for the identification of asbestos fibres,** *by being able to meet the following assessment criteria:*

    2.1 Identify asbestos fibre characteristics by the use of PLM.
    2.2 Demonstrate the use of refractive index liquids in the identification of asbestos fibres.

3. **Carry out appropriate health and safety procedures in the analysis of asbestos samples,** *by being able to meet the following assessment criteria:*

    3.1 Ensure that all analytical procedures are performed safely.
    3.2 Use appropriate PPE during analytical procedures.

Content:

1 Carry out preparatory procedures for identifying asbestos fibres by polarised light microscopy

1.1 *Prepare samples for polarised light microscopy:* Examination under low power stereo microscope, fibre selection, fibre extraction from materials, sample preparation methods including use of acids and solvents.

1.2 *Set up a polarising microscope for use:* use and set-up of Koehler or Koehler type illumination; alignment and use of the rotating stage, polarisers and eyepieces, field and sub-stage diaphragms, phase and dispersion objectives.

2 Carry out polarised light microscopy for the identification of asbestos fibres

2.1 *Identify asbestos fibre characteristics by the use of polarised light microscopy:* identification of fibres by their characteristics (morphology and colour); pleochroism and birefringence (interference colours); signs of elongation and extinction of different asbestos types.

2.2 *Demonstrate the use of refractive index liquids in the identification of asbestos fibres:* Becke line and dispersion colours using refractive index liquids and dispersion objective; assessment of refractive indices of asbestos fibres, refractive indices of similar fibres, use of phase contrast for assessment of refractive index.

3 Carry out appropriate health and safety procedures in the analysis of asbestos samples

3.1 *Ensure that all analytical procedures are performed safely:* Safe systems of work and risk assessments complied with during analytical procedures.

3.2 *Use appropriate PPE during analytical procedures:* Appropriate personal protective equipment used during analytical procedures and handling of chemicals

Assessment:

Attainment of the Learning Outcomes for Units 1 and 2 will be assessed by a written examination

Attainment of the Learning Outcomes for Unit 3 will be assessed by a practical examination which will include tasks for each of the assessment criteria for these units, and oral questioning during the practical.

Part of the assignment comprises the analysis of 6 No. AIMS samples.

Written and practical examinations will be set and marked by the centre and will be externally verified by RSPH.

In order to be awarded the certificate candidates must achieve the learning outcomes for all units.

Guidance:

Recommended Reading & Additional Reading	**Qualification**				
	Analyst	**Surveyor**	**Project Manager**	**Dutyholder**	**Bulk Analysis**
Asbestos - The Analyst's Guide for Sampling, Analysis and Clearance Procedures (HSG248) HSE	✓	✓	✓	✓	✓
Asbestos: The Licensed Contractors Guide (HSG247) HSE	✓		✓	✓	
Asbestos and Man-Made Mineral Fibres In Buildings. Practical Guidance Thomas Telford 1999		✓			
Asbestos Essentials - Task Manual Task guidance sheets for the building, maintenance and allied trades. (HSG 210) HSE	✓		✓	✓	
Introduction to Asbestos Essentials comprehensive guidance on working with asbestos in the building maintenance and allied trades. (HSG 213) HSE	✓		✓	✓	
Asbestos: The Survey Guide (HSG264) HSE		✓		✓	
HSG189/2 Working with asbestos cement HSE	✓		✓	✓	
Managing and Working With Asbestos, Approved Code of Practice (L143) HSE	✓	✓	✓	✓	✓
HSG53 The selection use and maintenance of respiratory protective equipment HSE	✓	✓	✓		
Lab 30 – Application of ISO/IEC 17025 for Asbestos Sampling and Testing UKAS			✓		
RG8 - Accreditation of Bodies Surveying for Asbestos in Premises UKAS		✓			
Asbestos for Surveyors (W. Sanderson) Estate Gazettes 2nd edition (2007)		✓			
A Comprehensive Guide to Managing Asbestos in remises (HSG 227) HSE		✓		✓	
Asbestos: RICS Guidance Note: Implications for members and their clients. RICS Books 2003				✓	
Construction (Design and Management) Regulations ; ACOP & Guidance, (L153) HSE			✓	✓	
How Are You Managing? - Dealing with the Risks of Asbestos in Buildings (DVD)				✓	
Managing Asbestos in Buildings: A Brief Guide. INDG223 HSE 2012		✓		✓	
Hazardous Waste Regulations 2005	✓		✓	✓	

Note that many of the HSE publications are available as free downloads from the HSE web-site at http://www.hse.gov.uk/pubns/books/index-catalogue.htm

The following web-sites also have useful information:

Asbestos Testing and Consultancy Association www.atac.org.uk
Asbestos Removal Contractors Association www.arca.org.uk
Health and Safety Executive www.hse.gov.uk
Royal Institution of Chartered Surveyors www.rics.org.uk

Progression:

Learners who achieve this qualification can progress to the:
RSPH Level 4 Certificate in Asbestos Laboratory and Project Management

Special Assessment Needs:

Centres that have candidates with special assessment needs should consult The Society's Reasonable Adjustments and Special Consideration Policy; this is available from RSPH and the RSPH web site (www.rsph.org.uk).

National Occupational Standards:

The qualification has been mapped to the following National Occupational Standards of Construction Skills:

COSAO15. Carry out tests in asbestos bulk analysis

Further details of these National Occupational Standards can be obtained from RSPH Qualifications.

Recommended Qualifications and Experience of Tutors:

The Society would expect that tutors have teaching experience and a qualification in a relevant subject area, but recognises that experienced teachers can often compensate for a lack of initial subject knowledge, or experienced practitioners for a lack of teaching experience.

The Society recommends that centres utilise a team of tutors in the delivery of this qualification, and that at least one tutor has suitable practical experience in the analysis of asbestos samples by polarised light microscopy within the previous five years.

Other Information:

All RSPH specifications are subject to review. Any changes to the assessment or learning outcomes will be notified to Centres in advance of their introduction. To

check the currency of this version of the specification, please contact the Qualifications Department or consult the RSPH website.

Centres must be registered with RSPH.

Any enquiries about this qualification should be made to:

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