



CARE GUIDANCE

RECOMMENDATIONS ON BEST PRACTICE

LEVEL 2

Monitoring methods for airborne fibres



MONITORING METHODS FOR AIRBORNE FIBRES

INTRODUCTION

This is a level 2 document in the ECFIA CARE Guidance series and should be read in conjunction with the level 1 document "Working with HTIW – Effective Risk Management".

This document focuses on monitoring methods for airborne fibres that can be used to establish if workplace controls are adequate and that worker exposure has been minimised. It is not intended to be used as a tool to carry out monitoring but as a guide to highlight key points of monitoring which should be considered when choosing a professional to carry out occupational hygiene monitoring.

WHAT IS THE CARE PROGRAMME?

ECFIA's Controlled And Reduced Exposure (CARE) Programme is an important part of the Product Stewardship Programme. It allows employers to proactively minimize fibrous dust exposure and thus protect workers' health.

WHAT ARE THE CARE GUIDANCE DOCUMENTS?

These documents form a comprehensive library of information on the safe handling and use of HTIW products. They have been written by industry experts and are designed to give customers of ECFIA members helpful information to put in place effective controls to minimise exposure to airborne fibres. This series of documents will progressively grow as new documents are produced.

Level 1 guidance document: "Working with HTIW - Effective risk management"

Level 2 guidance documents: Risk management measures applicable to HTIW

Level 3 guidance documents: Examples of specific applications

REGULATORY SITUATION

With the exception of ASW/RCF¹ there are no European-wide harmonised OEL's for respirable airborne fibres. However, the majority of countries do have OELs in place, either fibre specific or in the form of generic dust limits. Where there is an OEL in place employers have a duty to ensure these are not exceeded during the working day. Where there is doubt regarding compliance, occupational hygiene monitoring can be applied using recognised test methods to establish information on the airborne fibre concentration levels to which workers are exposed.

There are two types of OEL in place in Europe for High Temperature insulation wool (HTIW): inhalable dust (mg/m³) and airborne fibres (f/ml). These OEL's vary from country to country and require different monitoring methods which are briefly described below. **Always check with the appropriate regulatory body in your country which OEL's apply.**

DESCRIPTION OF METHODOLOGY KEY POINTS

In order to show compliance with an OEL monitoring should be carried out using personal air sampling on workers during the course of their normal working shift.

If the working shift is longer than 8 hours, a conversion factor will need to be applied to the results to compare with an OEL which is based on an 8 hour working shift.



Fig. 1 & 2: Personal air sampling unit for airborne fibres

It is sometimes desirable to carry out area monitoring, for example next to a machine that appears to be particularly dusty, to get an accurate picture of emission sources within a workshop, but these measurements cannot be used to show compliance with OEL's.

The two different methodologies require two different sampling assemblies (filter/sampling head/holder) and different routes of analysis following sampling. Sampling should be carried out by a qualified and competent occupational hygienist. The information below is intended to assist you in making sure the correct protocols are followed when monitoring is carried out.

¹ A binding occupational exposure limit value (BOELV) was established for ASW/RCF at 0.3 f/ml in December 2017, extending the EU Carcinogens and Mutagens Directive. This limit value must be introduced by all Member States into their national laws no later than January 2020. For further detail see [ECFIA BOELV update](#)

Inhalable dust

Method of Analysis: gravimetric (weight change of filters following monitoring).

Type of Filter: commonly glass filter, maybe a membrane filter if further analysis is required.

Sampling Head: if only total dust is required then an IOM sampling head or UKEA sampling head should be used; if multiple dust fractions are being collected the sampling head/cassette will differ.

Typically one filter is used to cover the whole of the monitoring period, the higher the density of dust collected on the filter the more accurate the gravimetric analysis will be.



Fig. 3: Sampling assembly UKEA head (total dust)

Airborne fibres/Fibrous dust

Method of Analysis: fibre counts by optical microscopy (PCOM) or scanning electron microscope (SEM).

Type of Filter: MCE membrane filter, gridded, 0.8µm pore size.

Sampling Head: open-faced electrically conducting cylindrical cowl, 25 mm in diameter.

Depending on the work task being sampled it may be necessary to use a low flow rate and multiple filters per 8 hour shift to ensure that the filters do not become overloaded, which makes accurate evaluation (fibre count) difficult or even impossible.



Fig. 4: Sampling assembly respirable fibre - 25mm cowl

**FURTHER
INFORMATION**

Detailed information on the methodology used for monitoring airborne fibres can be found on the UK: HSE website:

- <http://www.hse.gov.uk/pubns/mdhs/pdfs/mdhs59-2.pdf>
- <http://www.hse.gov.uk/pubns/mdhs/pdfs/mdhs14-4.pdf>

France

French norm AFNOR : XP X 43-269; Qualité de l'air – Air des lieux de travail – Prélèvement sur filtre à membrane pour la détermination de la concentration en nombre de fibres par les techniques de microscopie :

MOCP, MEBA et META – Comptage par MOCP ; décembre 2017

Germany

Luftbeschaffenheit – Luft am Arbeitsplatz – Probenahme auf Membranfilter zur Bestimmung der Faserzahlkonzentration durch Mikroskopiemethoden:

Phasenkontrast-Lichtmikroskopie (MOCP), elektronische Mikroskopie mit analytischer Abtastung (MEBA), elektronische Mikroskopie mit analytischer Transmission (META) – Zählung mittels MOCP