

## Annex 2 – Dust Monitoring Protocol

### **Scope**

The dust monitoring protocol is intended to be used by any company that wishes to carry out occupational exposure assessment in order to measure dust exposure levels at the workplace. It is compatible with all current national legislation in the EU. The requirements described below are more applicable for companies with no representative data on dust exposure levels. For the other companies (for example with valid database or implementing a similar dust monitoring protocol for a long time), a lighter version of this protocol (with no need to comply fully with all the requirements) can be applied.

### **Objective**

The objective of the dust monitoring protocol is to collect dust exposure data in order to enable the different companies to assess compliance with relevant national and EU occupational hygiene provisions, such as Occupational Exposure Limit Values, and to guide prevention. It may also enable to collect representative and comparable data on occupational dust exposure levels among companies where Respirable crystalline silica exposure is experienced in order to produce data on health risk assessment from occupational dust exposures and to start the elaboration and production of exposure data like “job-exposure matrices” available for possible further epidemiological survey.

### **Requirements**

There are two types of measurements commonly used:

- Personal;
- Static.
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Both types of measurement can be used jointly as they are complementary.

It is up to the experts designated by the Employers and the employees’ representatives to opt for the most adequate solutions, while respecting the national and EU provisions.

The following general requirements (taken from the European Standards EN 689 and EN 1232 – see references) should be followed:

- For personal sampling, the sampling equipment must be worn by the worker (within the breathing zone of the worker).
- The collected dust fractions must be at least respirable and (optional) inhalable and thoracic dust fractions.
- The sampling equipment used to collect the dust samples must be in conformity with the European standard EN 481 (for personal measurement – see references).
- The sampling locations should follow at least a set of well-defined job functions<sup>3</sup>.
- The sampling duration should correspond to a full shift (7-8 hours). The number of samples for each job function should be such that it is representative of the worker exposure<sup>4</sup>. When it is

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<sup>3</sup> For example, in the industrial minerals industry, the following job functions were determined: quarry operator (outdoor), crusher operator (indoor), wet process operator, dry process operator, miller operator, bagging operator, transport/bulk loading, foreman/plant management staff, laboratory worker, maintenance and multi-skilled operator (multi-skilled operator is an operator whose percentage of his working time is less than 50% in any other job function category).

<sup>4</sup> For compliance with national legislation or prevention, one or a few samples might be enough but for statistical purposes (for example job-exposure matrices, epidemiological study...), 6 per job function is the minimal number required.

deemed necessary, the Employers' and the Employees' representatives will take joint decisions on the most appropriate sampling duration and periodicity.

- The analytical technique to determine the quartz (and cristobalite) content must be either X-ray diffraction or Fourier transform infrared spectroscopy as required in different national standards.
- A full documentation on the equipment and the procedures must be recorded by the companies (with the help of the organisation responsible for sampling and the analysis) along with dust measurement data.
- The laboratories involved in the quartz analysis should be accredited and/or should join an inter laboratory round exercise to ensure the quality and validity of their procedures and results.

### **Main references**

European standards:

EN 689 Workplace atmospheres-Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy, 1995, CEN.

EN 481 Workplace atmospheres-Size fraction definitions for measurement of airborne particles, 1993, CEN.

EN 1232 Workplace atmospheres-Pumps for personal sampling of chemical agents-Requirements and test methods, 1997.

Note:

Companies should check their national regulation and national standards to make sure their dust monitoring comply with their national requirements. Also, many countries have technical guidance documents available on occupational exposure assessment which may be used to implement dust monitoring at the workplace.