The identification and assessment of asbestos exposure from mineral raw materials in Germany - definitions, conventions, analytical methods, exposure situation and protective measures

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In Germany, there has been an exemption for the use of mineral raw materials containing asbestos since 1993 on the basis of the Hazardous Substances Ordinance. While activities involving asbestos or materials containing asbestos are generally prohibited since that time, demolition/maintenance work and working involving asbestos containing mineral raw materials (maximum permissible asbestos content: 0.1 mass%) are permitted, subject to compliance with defined protective measures. Activities involving mineral raw materials containing asbestos (e.g. talcum, gravel) NOA are usually released from tremolite / actinolite or anthophyllite, in a few cases also chrysotile / antigorite. The occurrence of grunerite or riebeckite is the exception. In occupational health and safety, analytical methods for determining exposure are limited to the detection of fibres with critical dimensions (L > 5 µm, D < 3 µm, L:D > 3:1; so-called WHO fibres). For this purpose, an extended definition of asbestos has been laid down in the Special Technical Rules for Hazardous Substances ("TRGS" 517), which concerns the chemical composition and morphology of the NOAs to be determined. It was also necessary to establish a convention by means of which asbestos minerals can be distinguished from other chemically similar minerals. In Germany, the determination of asbestos fibre concentrations is usually carried out by means of SEM-EDX analysis. The convention therefore refers to a distinction based on certain element contents and their ratios. This catalogue of criteria is freely available in the form of an EXCEL sheet. This ensures that different laboratories achieve comparable results. On this basis, exposure measurements have been carried out by the measurement services of the accident insurance institutions since about 1998. Measurement results are presented from the extraction of rocks in quarries, the cold milling of road pavings, the use of talcum and from asphalt mixing plants, among others. Depending on the determined exposure level, protective measures have to be taken for the activities concerned. In addition to general protective measures, special protective measures have been defined for specific industries. For the determination of the asbestos content in mineral raw materials, the TRGS 517 defines four specific determination procedures, including a procedure based on a dustiness test.