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Seminar III: Respiratory diseases in Asia: Reporting, recording, prevention and rehabilitation

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Targeted prevention strategies for asbestos related diseases

Substitution of asbestos

Summary

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Introduction

Asbestos is one of the most important hazardous substance in the workplace. Asbestosis, lung cancer, and mesothelioma are caused by asbestos exposure. Especially the latter can result from very low fibre doses. Therefore all necessary steps have to be taken to protect workers' health if asbestos material is present in workplace environments. This presentation shows the top priority pathway to this end: substitution of asbestos products.

General measures

On principle the possible steps of prevention are as follows. Most successful would be the complete substitution of the hazardous substances (in this case asbestos) or of the dangerous procedures. As a second measure and only if the first would not be leading to success, encapsulation (isolation) of the process could be regarded. The third priority lies with effective removal of airborne hazardous substances from the breathing zone by exhaust filtration. As a last resort after checking the possibilities of ventilation (technical or natural) personal protective devices may be used.

Because of the high risks connected to even very low asbestos exposure, only substitution can be regarded as ultimately successful.

Asbestos products

Asbestos has always been used because of its very favourable properties for a multitude of technical tasks and because it was readily available and cheap. It could be manufactured into textiles, mats, wools and almost all other types of materials. It was resistant versus heat and chemicals and had excellent insulation properties against heat, noise, or electricity.

The following fields of application have been and are still important: Fibers and fillers, personal protection against heat, fire protection of buildings, heat and noise insulation, gaskets and seals, filtration, friction linings of brakes and clutches, construction materials, and in chemical technology.

Substitution products

Experience has shown that all of the mentioned fields are by now covered by suitable substitution products. It is possible to find substitutes in all the above mentioned cases, however, there is not one universally applicable material suitable for all the cases above, but specific ones exist for all technical problems. It is therefore necessary to identify the specific needs of a given application beforehand, and then to find the suitable substitution product. Experience has shown that in many cases where asbestos had been used before, substitution products need not fulfil the high requirements for example with regard to thermal stability that were guaranteed by asbestos itself. Substitution products are by now available which are tailored to the specific necessities of a given application.

A very important aspect is in all cases that some of the substitution products may have hazardous properties themselves. So a very careful analysis in this respect must be performed as well.

In the presentation several examples for successful substitution strategies depending on the technical task are given.

General procedure

As a general recommendation the following steps should be performed when a company tries to solve the asbestos problems in their workplaces.

1. Get a clear picture about what your asbestos containing product can do, and what the substitution product needs to be able to do! This will lead to a better understanding of the acquisition process and a list of available substitution products from a technical viewpoint.
2. Check possible health risks from available substitution products. This will lead to a narrowing of possibilities.
3. Weigh your substitution work according to cost, effort, and necessity. But do this keeping in mind the costs (both material and immaterial) of not substituting the products. This will lead to a priority list and allows for sound planning of costs and benefits. It will also result in a proper action list.
4. Then go to work according to the action list as of above – but do not forget that the substitution process can be hazardous as well! Workers' protection is very important here.
5. Stop only when you have replaced all asbestos containing materials and processes. The question is not whether to perform substitution but when to start which part of this process.

Experience has shown that substitution can be done, but that it is a long and sometimes tiresome procedure a procedure without alternative.