

A Ban of Asbestos and Management of Asbestos Wastes - Case Study / Switzerland

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A.1 Background and Objectives

Asbestos is a common name given to naturally occurring fibrous minerals (silicates), which can be divided in two sub-groups: *serpentine* and *amphiboles*. Up to 95 % of all asbestos applications contain Chrysotile. *Chrysotile* is the only asbestos mineral in the *serpentine* group. Today, *Chrysotile* is still being mined mainly in Russia (Figure 1), Kazakhstan, China, Canada, Brazil, Zambia and South Africa.

Due to their physical properties, asbestos fibres have been used in a wide range of building materials, products and in technical equipment. These extremely fibrous minerals resist fire, heat, acids and many chemicals, and are thus also resistant to environmental influences. Other characteristic properties are strength, flexibility and insulating qualities.

Due to the very small size of asbestos, airborne asbestos fibres are inhaled and can pass deep into the lungs. Not the chemistry, but the physical properties of asbestos are the problem. Asbestos fibres break down and become thinner and thinner. These tiny fibres can lodge in the respiratory system and the lungs. The risk of developing asbestos-related cancer depends on the amount and duration of exposure.

Exposure to large amounts of asbestos fibres over longer periods, usually during work, can cause lung fibrosis, also called *Asbestosis*. *Lung cancer* causes the largest number of deaths related to asbestos exposure.

In the 20th century, asbestos was added to more than 3,500 products in various applications (Table 1). Asbestos containing materials (ACMs) can generally be divided in two categories, *asbestos cement* (AC) and *asbestos insulating boards* (AIB), or *bounded* asbestos (fibres are held tightly within the structure) and *unbounded* asbestos (fibres can easily be released).

Table 1: Asbestos applications

Bounded asbestos		Unbounded asbestos
▪ Asbestos cement wall panels	▪ Asbestos glazing compounds	▪ Asbestos insulating board panels
▪ Asbestos cement corrugated sheets	▪ Asbestos chaulking flange	▪ Asbestos insulating board ceiling tiles
▪ Asbestos cement roof sheeting	▪ Asbestos block- and clutch pads	▪ Asbestos fire doors and panels
▪ Asbestos cement downpipes/gutters	▪ Asbestos tile cement	▪ Asbestos insulation on pipes / lagging
▪ Asbestos cement scabbard tube	▪ Floor adhesive	▪ Asbestos ropes and cloth
▪ Asbestos cement cable and air duct	▪ Asbestos vinyl floor tiles / sheeting	▪ Sprayed asbestos coatings
▪ Asbestos cement containers	▪ Asbestos roofing tar	▪ Loose fill asbestos



Figure 1: Asbestos mine in Russia (source www.bbc.co.uk)



Figure 2: Sprayed Asbestos removal (Source ETI)

To this day, asbestos is still being mined, produced, added to numerous products and sold and exported to many countries. Estimated production is up to 4,000,000 tonnes per year. China, Russia and India count among the major users. In many countries, economic reasons still prevail over efforts to cease asbestos production.

Currently, there is no international [asbestos ban](#). Whereas the *amphibole* asbestos types are included in the [Rotterdam Convention \(Annex III\)](#) and the [Basel Convention](#) (see Annex I, III und VIII), the most common type *Chrysotile* asbestos is not specifically listed in any International Convention. During COP 5 of the Rotterdam Convention in June 2011 Chrysotile was once again not added to the banned chemicals list due to strong political opposition. For asbestos and asbestos wastes mentioned in Annex I und III of the *Basel Convention* transfrontier movements are only permitted after prior consent of the exporting, importing and transit countries.

Laws and regulations prohibiting asbestos types like *Amosite* and *Crocidolite*, but deliberately excluding *Chrysotile*, will hardly solve the global asbestos problem. There are countries with comprehensive and liable laws and guidelines regulating the proper removal and disposal of asbestos containing materials; whereas other countries are mining asbestos by means of heavy duty equipment (Figure 1).

Due to the long documented history of asbestos and its adverse health effects, this sharp contrast between the countries is hard to follow and understand.

A range of countries have banned Asbestos applications (table 2). In particular industrial countries have remediation activities of affected buildings and have established related waste management.

Table 2: Countries with national asbestos ban (Source: International Ban asbestos Secretariat)

▪ Algeria	▪ Czech Republic	▪ Iceland	▪ Malta	▪ Saudi Arabia
▪ Argentina	▪ Denmark	▪ Ireland	▪ Mongolia	▪ Seychelles
▪ Australia	▪ Egypt	▪ Israel	▪ Mozambique	▪ Slovakia
▪ Austria	▪ Estonia	▪ Italy	▪ Netherlands	▪ Slovenia
▪ Bahrain	▪ Finland	▪ Japan	▪ New Caledonia	▪ South Africa
▪ Belgium	▪ France	▪ Jordan	▪ Norway	▪ Spain
▪ Brunei	▪ Gabon	▪ Korea (South)	▪ Oman	▪ Sweden
▪ Bulgaria	▪ Germany	▪ Kuwait	▪ Poland	▪ Switzerland
▪ Chile	▪ Greece	▪ Latvia	▪ Portugal	▪ Turkey
▪ Croatia	▪ Honduras	▪ Lithuania	▪ Qatar	▪ United Kingdom
▪ Cyprus	▪ Hungary	▪ Luxembourg	▪ Romania	▪ Uruguay

A.2 Approach, Achievements and Results

Switzerland is one of the foremost countries in asbestos management. After assessment of health risk for the population by the ministry of health and the Swiss Accident Insurance (Suva), the ministry of environment prohibited the application of spray asbestos (Figure 2) in the 1970s. As unbounded asbestos material it contains a higher percentage of asbestos and releases fibres easily and consequently poses the highest health risk. This is also true for asbestos boards, asbestos cardboards (Figure 3), asbestos insulating board panels, asbestos ropes, and asbestos vinyl floor tiles (Figure 4). After further assessment of [health risks](#) and related [diseases](#), a [general asbestos ban](#), prohibiting all types of asbestos, followed in Switzerland in 1990.

To manage the asbestos legacy of products in use (mainly in buildings) a directive was established ([EKAS Richtlinie 6503](#)) which stipulates that unbounded asbestos materials must be reported and removed.

The related necessary removal techniques and precautions were/are clearly regulated in the Swiss national asbestos guidelines and in fact sheets.

Another necessary regulatory step by the ministry of health where threshold limits at workplace set at 10'000 respirable asbestos fibres per m³ of air. With regards to asbestos in indoor air in residential buildings no legal limit values were set. However the Swiss Ministry of Health recommends keeping

asbestos contamination as low as possible and concentrations above 1,000 respirable asbestos fibres per cubic meter (m³) of air shall not be tolerated and the source eliminated.

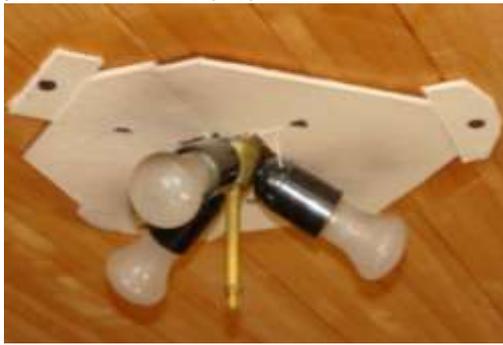


Figure 3: Asbestos cardboard under lamp (Source ETI)



Figure 4: Asbestos cushion vinyl floor tiles/sheeting (Source ETI)

Asbestos remediation and waste management experience show that only a step-by-step approach and careful planning will guarantee a sustainable removal and disposal of asbestos containing materials.

Step-by-step approach



Particularly when removing high-risk unbounded asbestos containing materials (Figure 2), it must be ensured that only qualified and licensed contractors will work on these materials. A key-element is the definition and supervision of appropriate precautions for the environment and the workers. Asbestos containing materials which cannot be removed, must be clearly labelled (Figure 5) as such for remediation and future disposal.

Where unbounded asbestos applications have been removed, or bounded asbestos products have been broken, cut, damaged or disturbed, indoor air measurements must be carried out before using the rooms again (Figure 6). Only such measurements will allow an assessment of the effectiveness of the works and measures, and indicate the remaining number of fibres in the air.

[Asbestos waste](#) is disposed of in dedicated landfills.



Figure 5: Labelling of asbestos containing materials (Source ETI)



Figure 6: Indoor measurement after clean up in a school building (Source ETI)

A.3 Conclusions and Lessons Learnt

The conclusions and lessons learnt from the Swiss experience can be summarised as follows:

- All different asbestos types should be addressed within one comprehensive management frame.
- An early start of asbestos management will save life in the respective country.
- Considering overall health risks, a general asbestos import and production ban, prohibiting all types of asbestos is recommended. If stakeholders require exemptions, cost/benefit analysis should be performed with adequate considerations of the external cost and determining future liability of the respective stakeholders.
- To manage the asbestos legacy of products in use (in particular in buildings) a legislative frame should be established which stipulates the reporting and removal of asbestos materials which are a direct threat to health (in particular unbounded asbestos). Other sources may remain in use until necessary repair or reconstructions work or demolition of the buildings take place. At this time the owner of the building must guarantee the appropriate asbestos management.
- The necessary removal techniques and precautions should be clearly regulated in a national asbestos directive. These regulations are to be supported by fact sheets for specific applications.
- Removals of asbestos materials should always be supervised by an expert company.
- After asbestos removal activities, indoor air measurements should be performed to assess the effectiveness of the work, and to approve the works.

A.4 Guidance and information materials available

Factsheet Asbestos www.eti-swiss.com

Asbestos legislation EU

<http://ECr-lex.ECropa.EC/LexUriServ/LexUriServ.do?uri=OJ:L:2009:330:0028:0036:DE:PDF>

<http://ECr-lex.ECropa.EC/LexUriServ/LexUriServ.do?uri=OJ:L:1999:207:0018:0020:DE:PDF>

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:097:0048:0052:EN:PDF>

International ban Asbestos Secretariat: <http://ibasecretariat.org/>

Wikipedia basic overview: <http://en.wikipedia.org/wiki/Asbestos>

Worldbank: Good Practice Note Asbestos: Occupational and Community Health Issues

<http://siteresources.worldbank.org/EXTPOPS/Resources/AsbestosGuidanceNoteFinal.pdf>

US EPA: <http://www.epa.gov/asbestos/>