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Asbestos: Fibres of subterfuge

Things seemingly innocent often hide a seamy underside. Thus not many know that asbestos, widely used in making roofings, cement pipes, and conduits for electrical cables, has ruined the health of many a worker either mining it or making things out of it. Finished asbestos products in themselves may not be harmful, but there is enough scientific evidence to suggest that it poses a health hazard for the worker exposed to its fibres.

What is it?

The word 'asbestos' in Greek means 'indestructible'. Greeks called asbestos the 'magic mineral'. Asbestos is a generic term, referring usually to six kinds of naturally occuring mineral fibres. Asbestos minerals fall under two groups: **Serpentine**, which includes chrysotile (white asbestos) and **Amphibole**, which includes amosite (brown asbestos), tremolite, actinolite, anthophylite, and crocidolite (blue asbestos). Of these six, three are used more commonly. Chrysotile is the most common, accounts for almost 90 per cent of the asbestos used in the industry, but it is not unusual to encounter Amosite or Crocidolite as well. Though Crocidolite asbestos is banned in India, it can still be found in old insulation material, old ships that come from other countries for breaking in India.

All types of asbestos tend to break into very tiny fibre, almost microscopic. In fact, some of them may be up to 700 times smaller than human hair. Because of their small size, once released into the air, they may stay suspended in the air for hours or even days. Asbestos fibres are virtually indestructible. They are resistant to chemicals and heat, and are very stable in the environment. They do not evaporate into air or dissolve in water, and they do not break down over time. Because of its high durability and with tensile strength asbestos has been widely used inconstruction and insulation materials- it has been used in over 3,000 different products.

Where do we use it?

After mining and milling (crushed/grinding) of asbestos, it is processed through various methods and used for making cement products, gasket sheet material, friction material, heat resistant textiles, some special applications like in paints, thermoplastics etc.

List of asbestos containing materials[1]:

Cement pipes, elevator brake shoes, Asbestos-cement wallboard, HVAC Duct Insulation, Asbestos-cement Siding, boiler insulation, asphalt floor tile, breaching insulation, vinyl floor tile, ductwork flexible fabric connections, vinyl sheet flooring, cooling towers, flooring backing, pipe insulation (corrugated air-cell, block,

etc.), construction mastics (floor tile, carpet, ceiling tile, etc.), heating and electrical ducts, acoustical plaster, electrical panel partitions, decorative plaster, electrical cloth, textured paints/coatings, electric wiring insulation, ceiling tiles and lay-in panels, chalkboards, spray-applied insulation, roofing shingles, blown-in insulation, roofing felt, fireproofing materials, base flashing, drywall taping compounds, joint compounds, spackling compound, thermal paper products, packing materials (for wall/floor penetrations), fire doors, gaskets, caulking/Putties, laboratory hoods/table tops, adhesives, laboratory gloves, wallboard, fire blankets, fire curtains, vinyl wall coverings, elevator equipment panels.

In India, asbestos is used in manufacture of pressure and non pressure pipes used for water supply, sewage, irrigation and drainage system in urban and rural areas, asbestos textiles, laminated products, tape, gland packing, packing ropes, brake lining and jointing used in core sector industries such as automobile, heavy equipment, petro-chemicals, nuclear power plants, fertilizers, thermal power plants, transportation, defence.[ii]

Is it a health hazard?

According to the United States National Toxicology Programme database[iii], there is sufficient evidence for the carcinogenicity of asbestos and all commercial forms of asbestos in humans (IARC S.4, 1982). Occupational exposure to chrysotile, amosite, anthophyllite, and mixtures containing crocidolite has resulted in a high incidence of lung carcinomas (malignant tumors). Mesotheliomas have been observed after occupational exposure to crocidolite, amosite, and chrysotile asbestos. Gastrointestinal cancers occurred at an increased incidence in groups occupationally exposed to crocidolite, amosite, chrysotile or mixed fibers containing crocidolite, although not all studies are consistent in this respect. An excess of laryngeal cancer has also been observed in some groups of exposed workers. No clear excess of cancer has been associated with the presence of asbestos fibers in drinking water. But the epidemiological and experimental studies that have been done are not sensitive enough to identify small excess cancer risks to the population] Mesotheliomas have occurred in individuals living in the neighborhood of asbestos factories and mines and in people living with asbestos workers (IARC S.7, 1987). Both cigarette smoking and occupational exposure to asbestos fibers increase lung cancer incidence independently. When present together, they act multiplicatively (IARC V.2, 1973; IARC V.14, 1977; IARC S.1, 1979; IARC S.4, 1982).

A study based upon findings from two asbestos cement manufacturing plants has shown evidence of a greater risk of mesothelioma from exposure to crocidolite than to chrysotile asbestos (Hughes et al., 1987). In the European Union, Chrysotile has been classified as a category 1 carcinogen [Dangerous Substances Directive, 67/548/EEC, (3)][iv]

Damning facts

- Asbestos has been responsible for over 200,000 deaths in the United States, and will cause millions more deaths worldwide.
- Deaths from mesothelioma among men in western Europe will increase from just over 5,000 in 1998 to about 9,000 by the year 2018.
- In western Europe alone past asbestos exposure will cause a quarter of a million deaths from mesothelioma over the next thirty-five years. The number of lung cancer deaths caused by asbestos is at least equal to the number of mesotheliomas, suggesting that there will be more than half million asbestos cancer deaths in western Europe over next 35 years.
- In Sweden, the number of deaths caused each year by malignant mesothelioma is greater than the number of deaths caused in that country by all workplace injuries.

Source: Information provided by International Ban Asbestos Secretariat, UK.

The strictest occupational exposure limits in the world for chrysotile asbestos (0.1 f/cc) are estimated to be associated with lifetime risks of 5/1,000 for lung cancer and 2/1,000 for asbestosis.[v] According to experts, these exposure limits can be technically achieved in the United States and few other highly

industrialised countries, but the residual risks still are too high to be acceptable. In newly industrialised countries engaged in mining, manufacturing, and construction, asbestos exposures are often much higher, and the potential for epidemics of asbestos disease is greatly increased.[vi] [vii]

In India the occupational exposure limits to all kinds of asbestos in the work environment is 2 f/cc, where as in rest of the world it is between 0.1 f/cc-0.5f/cc. According to Dr S K Dave of National Institute of Occupational Health, Ahmedabad, "we have to bring down the occupational exposure limits to .1f/cc at any cost. Also we have to completely ban activities of all kinds of amphibole asbestos, especially tremolite. It is extremely injurious to health and hazardous for workers. The tremolite mining in Rajasthan is done under very hazardous conditions and should be immediately banned."

Diseases related to asbestos exposure

Asbestosis: It is an irreversible and progressive lung condition which results from the inhalation of asbestos fibres. Cases have been reported from 6-9 months' duration of heavy exposure. In asbestosis, lung tissue is scarred and thickened by the action of the asbestos fibres in the alveoli, the air sacs. The latency period for asbestosis is usually at least ten years and higher the exposure, the greater the chances of developing the disease. Asbestosis tends to be linked to occupational exposure although cases of asbestosis among those not occupationally exposed have been known. It can be detected by X-rays results only. Coughing and difficulty in breathing are the typical symptoms of asbestosis. There is no cure or treatment for this disease. People suffering from asbestosis could ultimately develop lung cancer or mesothelioma.

Mesothelioma: Mesothelioma is a cancer rare in the general population, it is almost always associated with past exposure to asbestos. Pleural mesothelioma, clearly attributed to asbestos exposure, is cancer of the thin membrane enclosing in the lungs. Mesothelioma is not a associated with smoking. Peritoneal mesothelioma, on the other hand, is a tumour of the membrane also made up of mesothelial cells, which envelops the abdominal organs. It can be contracted from low exposures to asbestos and accounts for many victims who contract an asbestos-related disease through environmental exposure. The latency period for mesothelioma is generally between thirty to fifty years, from the onset of exposure to asbestos. The diagnosis for the patient is affected by the cell type and the size, stage, extent and susceptibility of the tumour to treatment. Early diagnosis and the various different treatments such as chemotherapy, radiotherapy, surgery and surgery in combination with photodynamic therapy can prolong survival. But treatments for mesothelioma are so far of and has very limited effectiveness. On an average, patients suffering from mesothelioma survive for about eighteen months to two years following diagnosis. There is no known cure for this fatal disease.

Lung Cancer: An article in The Lancet in 1934 presented evidence of a link between asbestos and lung cancer. Asbestos-related lung cancer is a prescribed disease provided the patient exhibits another clinical sign of asbestos exposure such as asbestosis, or pleural thickening and evidence of occupational asbestos exposure. Studies of particular groups of asbestos exposed workers suggest that the number of excess lung cancers produced is - roughly and with considerable variation from study to study - double the number of mesotheliomas. Though many of these go unrecognised by doctors and patients. Asbestos-related lung cancer can occur from occupational or environmental exposure. The risk of lung cancer is especially great for asbestos workers who smoke cigarettes. The risk is 5 times as great as it would be from smoking alone, and 50 times as great as that for people who neither smoke nor work with asbestos. Smokers who work with asbestos can decrease their cancer risk by quitting smoking.[viii]

Besides these commonly occuring diseases, there are diseases such as Bilateral Diffuse Pleural Thickening which can sometimes produce serious impairment of lung function. Thickening of the pleura may reduce lung function and victims can experience severe shortness of breath. Diffuse pleural thickening can occur on one side of the lungs or on both sides (bilateral). Pleural Plaques, while not classed as a disease, is usually regarded

as a marker of past asbestos exposure.

Routes of exposure

Asbestos fibres are released into the environment from the natural occurrence of asbestos in the earth and as a result of wear and deterioration of asbestos products. Asbestos minerals are emitted into the atmosphere and water systems from the mining and milling of asbestos ores. Applications of asbestos materials to buildings and vehicle brake linings account for a significant amount of emissions to the atmosphere. Demolition of buildings with asbestos insulation or fireproofing, mostly in the western country where buildings are all insulated, may cause high atmospheric concentrations for relatively short periods of time.

The primary routes of potential human exposure to asbestos is inhalation and ingestion. Asbestos is used so widely that the entire population is potentially exposed to some degree. According to the National Toxicology Programme database[ix], in the US gross pollution in the areas of mines, factories, and shipyards is far less than 30-50 years ago, but general levels of exposure to the fibers in air, water, and food has increased from building construction and demolition and the deterioration and wearing of asbestos-containing materials. For India, no such accurate figures can be stated as quantification has not been done. Going by a few studies that have been done in the small-scale sectors (organised sector), it is very clear that no such decrease has been observed. According to an expert committee report[x] "the problem of environmental pollution and thereby health afflictions of workers in small scale sector, assume greater significance due to peculiar situations in which the units operate. Constraints of finance, technical know-how and competence regarding the environmental pollution control and to some extent, lack of preference of health in relation to financial gains are some of the important factors which influence the appropriate development of health and safety strategy." Other factors include migratory nature of workers and non maintenance of medical or other records by the factory owners for the migrant labourers which makes it difficult to track the exposure-related diseases.

According to Dr Dave, NIOH had done an environmental evaluation in August 1999 of chrysotile mining in Cuddapah, Andhra Pardesh and tremolite mining in Rajasthan and found that "in Cuddapah the fibre levels has been brought down below the permissible limits, but in Rajasthan it's 7 to 10 times higher than the permissible limits."

Worker exposure is a concern in the mining and milling of asbestos, during the manufacture of all asbestos products, and in the construction and shipbuilding

industries. In India, according to a technical committee report[xi] "….uncontrolled milling activities, especially manual operations, as currently practised in tremolite mills, cannot ensure the safety of workers."

In the US, Occupational Safety and Health Association reported that about 2.5 million workers are estimated to have some potential exposure to asbestos mainly in the building trades. Worker exposure occurs in asbestos end-product use occupations, e.g., asbestos insulation workers, brake repair and maintenance workers, building demolition workers, asbestos abatement workers and most of the construction trades. [xii]

People may encounter higher-than-average environmental asbestos concentrations in air if they live near an asbestos-containing waste site or asbestos-related industry, if they use any of a variety of asbestos-containing products, if they live or work in a building with deteriorating asbestos insulation, or if they live or work in a building that has undergone a poorly performed asbestos removal operation (ATSDR, 1995a). Families of asbestos workers were potentially exposed to high fiber levels through contaminated clothing brought home for laundering. Asbestos exposure levels ranging from 100 to 500 ng/m3 were found in houses of workmen in the US (IARC V.14, 1986).

In India, there are no comprehensive studies on the secondary exposure of asbestos and its impact, but individuals have observed and documented some cases of secondary exposures. Dr SR Kamath, a physician who has worked with asbestos workers for a long time, has observed number of asbestosis cases where patients who have not directly worked with asbestos had contracted the disease. "….patient was an industrialist's son, owner of an asbestos boxing plant...was exposed to the dust and diagnosed with asbestosis. In another case, the patient had an office in the first floor of a building which had asbestos boxing shed in the ground floor. The patient got exposed to asbestos fibres and dust through the AC ducts into the office...he was diagnosed with asbestosis too. A railway master was diagnosed with asbestosis due to the constant loading of asbestos in the rail wagons."
Central Pollution Control Board, monitored eight major asbestos products manufacturing units in India and found that six of them were not complying with the emission norms and for two compliance or non-compliance couldn't be ascertained. In most cases there were no monitoring platforms; bag house; chimneys and stacks were not properly maintained, and operations were intermittent.[xiii]

Sources and types of air pollutants from various asbestos related activities[xiv]:

Sources	Pollutants
Asbestos mining and milling	Fibre, dust
Asbestos bag opening and asbestos grinding sections	Fibrous dust (fibre + suspended particulate matter-SPM)
Main cement silos, plant cement silos, transfer lines	Cement dust (SPM)
Storage section for oxidants, colouring agents, metal powders, powder resins, powder metal oxides etc.	Miscellaneous dust (SPM)
Raw materials mixing section	Asbestos dust, cement dust and miscellaneous dust (Fibre +SPM)
Pulverising section for broken/reject pieces	Mixed dust (Fibre +SPM)
Cutting and finishing operations	SPM
LDO baking ovens and furnaces	Soot, fumes, CO, No_x, SO_2, phenolic gas, ammonia, aldehydes
Boilers, incinerators	SPM, NO_x, SO_2

Asbestos related health studies in India

National Institute of Occupational Health, Ahmedabad, has done number of studies that clearly indicate the prevalence of asbestosis amongst asbestos workers in the country. There are no studies or data on prevalence of mesotheliomas or lung cancer caused due to asbestos exposure in India. But that does not mean that these diseases are not prevalent in India. According to Dr S K Dave of NIOH, "mesothelioma or lung cancer may occur years after a person has stopped working in a asbestos factory or mine and it is difficult to track these workers and do cohort studies. We do not have such infrastructure in the country. Also a person with mesothelioma or lung cancer, both debilitating diseases, won't be working, they will be either in hospital or would have died".

Health studies in asbestos industries and mines in India[xv]:

Type of Industry	Study done by	No. of workers examined	Prevalence of Asbestosis	Levels of asbestos fiber/ml
Asbestos cement industry				
Bihar (1968)	DP Banerjee	254	30% symptoms and signs	NA
Harayana	Harwant Singh, Central Labour Institute	900	58 workers (checked only lung functions, no X-rays were taken)	NA
Ahmedabad (1976)	NIOH	205	5%	>2
Hyderabad (1979)	NIOH	355	4.5%	>2
Coimbtore (1982)	NIOH	424	3.9%	<2
Mumbai (1985)	NIOH	279	3%	<2
Asbestos textile industry				

(1980)	NIOH	65	9%[a]	>2 [b]
Mumbai (1983-84)	Central Labour Institute	455	5.2%	Increasing with duration of exposure
Asbestos mines				
Cuddapah, Andhra Pradesh (1991) (Chrysolite asbestos)	NIOH	633	11%	
-Mines			3%	<2[c]
-Milling units			21%	>2[d]
Devgarh, Rajasthan (1992) (Tremolite asbestos)	NIOH	140		
-Mines				<2[e]
-Milling units			5%	>2[f]

a The prevalence of asbestosis was observed, i.e. 9% inspite of duration of exposure <10 years
b fibre levels were varying from 29 f/ml to 418 f/ml
c The low prevalence was observed i.e. 3% due to wet drilling and low content of asbestos fibre in parent rock
d The highest leveks observed were 224 f/ml at vibrator
e The levels were below 0.5 f/ml
f The highest levels observed were 33.96 f/ml

For worker's compensation, the Supreme Court of India in 1995 has identified NIOH as the final authority to certify asbestosis cases. Compensations are given through the Employees State Insurance Corporation (ESIC). Though figures are not available on the total number of compensations given by the ESIC, according to NIOH:

- Special medical board by ESIC gave 100% compensation to the dependents of two workers of asbestos cement factory (Hyderabad) who died due to mesothelioma of peritoneum.
- Two workers in Ahmedabad Electricity Company diagnosed as having asbestosis by NIOH have been compensated by Gujarat High Court.
- Twenty-five workers in asbestos jointing and packing industry at Mumbai were compensated by the Special medical board by ESIC.

In a legal case filed by the Consumer Education and Research Centre (CERC), Ahmedabad, in the Supreme Court in 1993, the court ruled that the industrial units must maintain a health record of every worker up to a minimum period of 40 years; insure workers under the Employees State Insurance Act or Workmen's Compensation Act; or give health coverage to every worker.

Asbestos production in India

Asbestos mining and milling activity is concentrated in the small scale sector in India, whereas asbestos products are manufactured in small, medium and large

scale sectors. Present annual consumption of asbestos is around 100,000 metric tonnes, one fifth of which is mined in India.[xvi] About 2,500 tonnes of chrysotile and 35,000 tonnes of tremolite asbestos are annually mined in India.[xvii] Andhra Pradesh, Rajasthan and Bihar are major asbestos mining belt of India with 20,000 tonnes being mined from these three states yearly. In addition, raw asbestos worth Rs 40 to 50 crores is imported annually.[xviii] About 100,000 tonnes of chrysotile asbestos are imported annually. The landed cost of imported asbestos is around Rs 35,000 per tonne. The indigenously mined tremolite asbestos is priced between Rs 150-1500 per tonne.[xix]

There are about 13 large scale and 673 small scale asbestos factories in the country. The annual turnover of the asbestos industry is around Rs 800 crores and gives direct employment to 6000 workers and indirectly to 100,000. The total trade volume for asbestos is 1,100,000 metric tonnes annually in India.[xx] According to Dr Dave, "the total use of asbestos in the country is 1.25 lakh tonnes, out of which nearly more than 1.0 lakh tonnes is being imported. About 90% of asbestos is being used by the asbestos cement industry."

Asbestos import by India, April 1996-March 1999[xxi]:

Type	Quantity (in tonnes)		
	April'96-March'97	April' 97-March'98	April'98- March'99
Asbestos in the form of chrysotile	3,050.622	4,658.806	10,941.346
Asbestos in rock form	3,830.849	17,223.861	19,215.457
Fibre raw beaten or washed or graded to length chrysotile	48,094.560	33,967.530	48,090.465
Fibre raw beaten or washed or graded to length amosite	4,609.108	2,149.927	4,663.975
Fibre raw beaten/washed/graded to length	24,049.482	22,760.934	22,658.065
Flakes or powder others	14	75	180
Waste-others	729.490	2,519.468	500
Total	84,378.111	83,355.526	106,249.308

Countries exporting asbestos to India are: Canada, Brazil, the Netherlands, Japan, USA, German F Republic, France, Spain, Sweden, Switzerland, United Kingdom, Greece, Kazakhstan, Romania, Russia, South Africa, Zimbabwe, China PRP, Swaziland, Czech Rep., Poland, Baharain, Latvia, Singapore, United Arab Emirates, Zambia.

Though India has banned the import of asbestos wastes (dust and fibre) since 1998 (ban notified on 13.10.98), the import data shows 500 tonnes of

asbestos has been imported by India between April 1998-March 99 from Brazil and Canada. Asbestos wastes are mostly imported from Brazil, Canada and USA, besides Kazakhstan, Poland, Russia, Zimbabwe, Swaziland.

While asbestos imports and use continues to grow in countries like India, its use has decreased significantly in the developed countries. Canada exports almost all of the asbestos (more than 96%) mined in the country, especially to Asia, whereas asbestos use in Canada is almost non-existent. In the US, demand for asbestos has continued to decline. Imports decreased 18%, and exports increased slightly over those of 1989. Apparent consumption decreased 18% from that of 1989.[xxii] Due to public awareness and concern, regulation, and liability; asbestos consumption is now 2 percent of what it was at its peak in 1974[xxiii].

Asbestos regulations in India

In India, asbestos is regulated under the Factories Act (1948), in which asbestosis is listed as a notifiable disease in the schedule 3 of the Act. Asbestos is also regulated under Air and Water Act and Hazardous Wastes (Handling and Management) Rules 1989 under the Environment Protection Act (1986). Besides these, Indian Standards Institution (ISI) has brought out a number of national standards and specification relating to asbestos mining, manufacturing and handling.

From the below table, its pretty evident that India has a very relaxed standards for asbestos emission in the environment. Thus exposing the community living around the asbestos factories and mines to high levels of asbestos fibres for 24 hours.

Emission standards for asbestos industry in different countries[xxiv]:

Country	Asbestos Dust	Mixed Dust
Australia	No visible emission	As for Asbestos
Austria	0.1 mg/Nm^3	NA
Belgium	0.1 mg/Nm^3	NA
Canada	2 f/cc	NA
Denmark	0.1 mg/Nm^3	NA
Dubai	5 f/cc	NA
EEC/UK	0.1 mg/Nm^3	NA
France	0.1 mg/Nm^3	0.5 mg/Nm^3
Germany	0.1 mg/Nm^3	2 mg/Nm^3
Greece	2 f/cc (0.2 f/cc crocidolite)	NA
India	4 f/cc	2.0 mg/Nm^3
Italy	NA	0.3 mg/Nm^3
Netherlands	0.1 mg/Nm^3	NA
USA	No visible emission	NA

Russia	NA	0.5 mg/Nm^3
Zimbabwe	0.5 f/cc	NA

International asbestos bans and global shift towards third world countries

While the developed world has responded to the asbestos health catastrophe with a progressive ban on the use of asbestos, the asbestos industry is progressively transferring its commercial activities to the third world. According to Laurie Kazan-Allen of Ban Asbestos Secretariat, UK "Multinational asbestos corporations present a deplorable history of international exploitation. These firms have opened large and profitable internal and export markets in Brazil and elsewhere in South America, and in India, Thailand, Nigeria, Angola, Mexico, Uruguay, and Argentina." Consider this, Brazil is now fifth largest producer and consumer of asbestos in the world, after Russia, Canada, Kazakstan and China.[xxv] While asbestos use in the United States amounts to well below 100 gm per citizen per year, asbestos use in Brazil averages more than 1,000 gm per citizen per year. In the third world countries, use of asbestos has been increasing at an annual rate of about 7 per cent. [xxvi]

Asbestos bans world-wide[xxvii]:

Date Event

1983 Iceland introduces ban (with exceptions) on all types of asbestos (updated in 1996).

1984 Norway introduces ban (with exceptions) on all types of asbestos (revised 1991).

1986 Denmark introduces ban (with exceptions) on chrysotile (came into force 1993).

1986 Sweden introduces the first of a series of bans (with exceptions) on various uses of chrysotile.

1990 Austria introduces wide-ranging ban on chrysotile (some exceptions).

1991 The Netherlands introduces the first of a series of bans (with exceptions) on various uses of chrysotile.

1992 Finland introduces ban (with exceptions) on chrysotile (in force 1993).

1992 Italy introduces ban on chrysotile (some exceptions until 1994).

1993 Germany introduces ban (with exceptions) on chrysotile.

1996 France introduces ban (with exceptions) on chrysotile.

1997 Poland bans asbestos.

1998 Belgium introduces ban (with exceptions) on chrysotile.

1999 UK bans chrysotile (with minor exemptions). EU agrees that all EU member countries (15 countries) will ban asbestos by 2005

2001 Republic of Chile decided to ban asbestos on 31st January 2001.The ban will take effect in six months.

US The U.S. EPA banned asbestos in most of its major uses in 1989. EPA's rules would have eliminated the use of various classes of products, the last ones in 1997. However, the asbestos industry challenged the rules in the court and was successful in getting them overturned[xxviii]. In spite of the ban being revoked, the asbestos consumption in the US has continued to drop from 800,000 metric tonnes in 1974 to 15,800 tonnes in 1999.

Brazil Right after the EU ban, the then the Brazilian Environment Minister announced his government's commitment to a similar ban. An article in the July 29, 1999 issue of the newspaper Estado de Sao Paulo discussed the new policy and its financial implications. Brazil produces 200,000 tons of chrysotile asbestos annually of which 30% is exported.

Other countries to have banned asbestos recently are Czech Republic, Slovenia, Switzerland, Saudi Arbia, New Zealand and The United Arab Emirates.

Ethics over profit

The World Trade Organization (WTO) was recently involved in a trade dispute case where Canada had challenged France for imposing a complete ban on all uses of all types of asbestos. Canada claimed that chrysotile asbestos, historically the most abundant form of asbestos, is not dangerous for human health if used carefully. WTO rejected the claim by Canada that the ban was an unfair trade practice because it was a barrier to trade in Canada's chrysotile asbestos exports. Canada is the world's leading exporter of asbestos, most of which goes to Third World countries. Canada has appealed the decision, and WTO is expected to issue a final ruling around March 2001.

Canada brought the case to the WTO in 1999, largely at the request of asbestos mining companies in Quebec. The European Union - which represented France in this case - claimed that it was not possible to ensure that asbestos products would always be used safely, and therefore a ban on all forms of asbestos was necessary to protect public health. WTO apparently accepted EU's evidence that "controlled use" of asbestos cannot be assured by regulatory means, that there is no safe level of human exposure to chrysotile asbestos, and that safer substitutes are available for asbestos products.

Alternatives

Asbestos fibres are being replaced by various substitute fibres- both natural and man made. Although there is a lack of full health and toxicological data for substitute fibres, based on basic principles of fibre toxicology (based on size,

diameter and propensity of a material to release fibres into the air), countries world-wide are replacing asbestos in the following asbestos containing products[xxix]:

- Asbestos cement products (profiled sheet, flat sheet, building boards, slates, pressure pipes and moulded goods): with Polyvinyl alcohol (PVA), cellulose, Polyacrylonitrile (PAN), glass fibre, unplasticised polyvinyl chloride (for pressure pipes).
- Friction material (brake linings, brake pads and clutch facings): with aramid fibres, PAN, some metal and semi-metallic materials are also used in combination.
- Gaskets and sealing materials: with aramid fibres in conjunction with cellulose pulp or glass fibres with various mineral fillers. For sealing material, glass yarn and mineral wools are used.
- Composites: with aramid fibre, glass fibre, carbon fibre, cotton, organic fibre, man-made mineral fibres and particulate mineral fillers.
- Heat-resistant textiles: with blends of organic, glass, metal and synthetic fibres. Refractory fibres are used at higher temperatures and synthetic organic fibres at lower temperatures.

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[iv] Paul TC Harrison et al. *Comparative hazards of Chrysotile asbestos and its substitutes: A European Perspective.* Environmental Health Perspectives, vol. 107, Number 8, August 1999
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[viii] Barry Castleman, ScD, environment consultant, USA. Personal communication.
[ix] Ibid note iii.
[x] Ibid note ii.
[xi] Report of study of asbestos sector. By Technical Committee appointed by the Ministry of Industry, Government of India, January 1995.
[xii] Ibid note iii.
[xiii] Comprehensive industry document on asbestos products manufacturing industry. Central Pollution Control Board. Series: COINDS/58/1997-98.
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[xviii] Ibid note xiii.
[xix] Ibid note xvi.
[xx] Asbestos Information Centre, New Delhi.
[xxi] Monthly Statistics of the Foreign Trade of India, DGCIS, Government of India.
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[xxiv] Ibid note xiii.
[xxv] Ibid note v. [Harington JS and McGlashan ND. South African asbestos: production, exports, and destinations, 1959-1993. Am J Ind Med. 1998; 33:321-325]
[xxvi] Ibid note v.
[xxvii] Information given by Ban Asbestos Secretariat, UK and Barry Castleman, ScD, environment consultant, USA. and U.S. Department of the Interior http://minerals.usgs.gov/minerals/pubs/commodity/asbestos/070499.pdf
[xxviii] Paper presented by Barry Castleman, ScD at Fiocruz conference on asbestos and asbestos substitutes, Sept. 3, 1998, Rio de Janeiro.

[xxix] Ibid note iv.

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