

# Chrysotile

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In 1995, Canadian chrysotile shipments decreased 3.8% from 1994 levels. Canadian mines, which are located in Quebec, operated at an average of 96% of current capacity. The tailings reprocessing operation in Newfoundland did not re-open in the spring of 1995 and, as a result, did not produce; only fibres from inventory were sold during the year. Average prices increased by about 3%. Total shipments for 1995 were estimated to be 510 800 t valued at \$233.7 million, compared to revised shipment figures for 1994 totalling 530 857 t valued at \$232.7 million.

Canadian exports of chrysotile for 1995 were an estimated 509 575 t. This represented a 4.1% decrease in volume from the previous year. The value of these exports decreased by an estimated 2.3%. Exports in

the January-September 1995 period totalled 377 165 t valued at \$226.3 million, compared with 379 605 t valued at \$222.7 million for the same period in 1994.

In 1995, world production of chrysotile is believed to have decreased by about 16% to reach a level of 2.3 Mt. This decrease is the result of continued problems in Russia and Kazakstan, where production has decreased steadily mainly due to a lack of funds since the collapse of the former Soviet Union.

Due to the closure of the Newfoundland operation and the indeterminate closure of the British Canadian operation in Quebec, employment in the Canadian chrysotile industry decreased by about 500 in 1995.

## CHRYSOTILE AND ITS USES

Chrysotile (a natural fibrous hydrated silicate) is the only form of asbestos in the serpentine group. Crocidolite, amosite, anthophyllite, actinolite and tremolite form the amphibole group. Of these minerals, chrysotile is the least dangerous to human health and is the only one extracted in Canada. Chrysotile, which is sensitive to acid, tends to dissolve in the lungs, unless these are overburdened from exposure to excessive levels in the occupational environment. All fibres that enter the lungs cause mechanical irritation. In the past, most of the problems associated with chrysotile have been due to the poor working practices that existed in the past, both in the handling and use of chrysotile. With the marked improvements in today's work practices and the increased protection of workers, the occupational risks associated with chrysotile have been tremendously reduced and are controllable with existing technology.

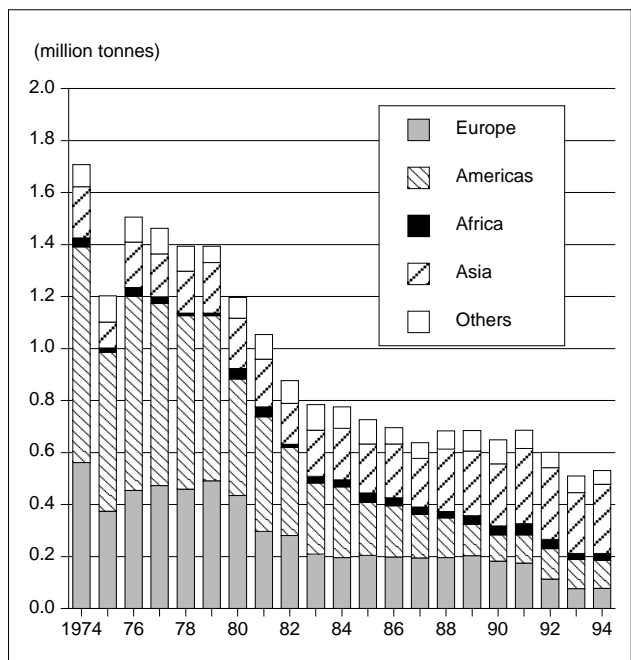
Because of their chemical and physical properties, chrysotile fibres are an extremely useful material that have been, and still are being, widely used throughout the world. In Canada, chrysotile fibres are classified into seven groups, each one with its own sub-categories with the longest fibres assigned to Group 1 and the shortest to Group 7. In decreasing length, chrysotile has been used in textiles, clothing, packings, woven brake linings, clutch facings, electrical insulation materials, high-pressure and marine insulation, asbestos-cement pipe, other

### CHRYSOTILE, WORLD PRODUCTION BY COUNTRY, 1995

Country	Tonnes <sup>e</sup>
Commonwealth of Independent States	1 000 000
Canada	510 800
China	250 000
Brazil	180 000
Zimbabwe	145 000
Republic of South Africa	100 000
Greece	50 000
Swaziland	30 000
India	25 000
United States	9 000
Colombia	5 000
Romania	3 000
Yugoslavia	1 000
Total	2 303 800

Sources: Natural Resources Canada;  
U.S. Bureau of Mines.  
<sup>e</sup> Estimated.

**Figure 1**  
**Canadian Chrysotile Exports, 1974-94**



Sources: Natural Resources Canada; Statistics Canada.

asbestos-cement products (e.g., sheets and mouldings, shingles), gaskets, paper products, vinyl sheet backings, and millboards. The shortest fibres (Group 7) are used in moulded brake linings and clutches, and as a filler in vinyl and asphalt floor tiles, cement, plastics, roof coatings, and caulking compounds. Some 85% of all chrysotile produced globally is used in asbestos-cement products. Low-density and friable products are no longer marketed and are prohibited in Canada under the *Hazardous Products Act*.

## CANADIAN DEVELOPMENTS

In 1995, the production levels of LAB Chrysotile, Inc. (the largest Canadian chrysotile producer) were similar to those of 1994, despite the temporary closure of the British Canadian complex on May 27, 1995, which affected over 400 employees. The loss in production was compensated by increased production at the two other mines: Black Lake and Bell. The indeterminate closure of the mine was announced on January 26, 1995. It was justified by high production costs and the need to carry out an exploratory program to assess if ore reserves were favourable to an improvement of the fibre concentration. Despite the closure of the mine, the hourly workers represented by the Confederation of National Trade Unions signed a new long-term contract that will remain in effect until November 11, 2001. The exploratory program is now well under way and the company is confident that results will be encouraging. However, a

final decision about the future of the mine is not expected until the spring of 1996. At the Bell mine, which is the only underground chrysotile operation in Canada, current reserves will permit its continuation until 1999. However, a drilling program is currently being undertaken to delineate further reserves, which may ensure the mine's life into the next century. An announcement is expected in mid-1996. The present contract for Bell's workers expires in March 1996 and it is expected that, as with the other operations of LAB Chrysotile Inc., a new long-term contract will be ratified by the parties. At the company's Black Lake operation, at current rates of production, reserves are sufficient for the next 15 years.

In February 1995, J.M. Asbestos Inc. completed its \$130 million ore development program that began in 1991. As a result, the company laid off about 140 of the 270 employees hired for the project. The remaining 130 employees have stayed with the company's workforce of some 700 and replaced workers who have retired. The company has now developed sufficient reserves to continue the operation until 2000 at its current production rate of about 210 000 t/y. In order to ensure continuity of the mine past this point, the company is finalizing the techno-economical study of the options available. The two options currently on the table are the continuation of the open-pit operation, and a long-term program for going underground. An announcement on what option the company will select is to be made by mid-1996. The company is expected to maintain its current production level and extend the life of the mine until 2020.

Contrary to previous years, Teranov Mining Corp. of Baie Verte, Newfoundland, did not return to production in the spring due to financial difficulties. The future of this operation appears to be uncertain. No decision has yet been taken by the bank on whether or not the company will be forced into receivership. This operation was the only tailings reprocessing facility in North America using a wet milling technology to recover the fibre. Teranov Mining Corp. is co-owned equally by Black Hill Minerals Ltd. (under administration) and Cliff Resources Corporation. During the course of 1995, Teranov Mining Corp. sold most of its inventory, which is now reduced to about 1000 t.

In British Columbia, at the site of the old Cassiar Mining Corporation operations, the joint-venture group comprised of Cliff Resources Corporation, Strategic Investments, and Black Hill Minerals Ltd. has invested about \$1.8 million in preparatory work for the construction of the reclaiming circuit of the main mill. They will need about \$10 million to complete the plant, scheduled for operation in 1997. The plan calls for the reprocessing of the existing tailings using a wet milling technique and, in the process, rehabilitation of the site. Chrysotile Management Corporation Ltd. will act as the marketing agent for this new operation, in addition to acting as the marketing agent for the inventory of Teranov Mining Corp.

## EXPOSURE LIMITS FOR NATURAL AND SYNTHETIC FIBRES IN QUEBEC

Substance	Exposure Limit Weighted Average
Actinolite	1 fibre/cm
Amosite	0.2 fibre/cm
Anthophyllite	1 fibre/cm
Attapulgit	1 fibre/cm
Chrysotile	1 fibre/cm
Crocidolite	0.2 fibre/cm
Erionite	Prohibited use
Tremolite	1 fibre/cm
Wollastonite	1 fibre/cm
Slagwool	1 fibre/cm
Rockwool	1 fibre/cm
Glasswool	2 fibres/cm
Refractory fibres (ceramic or other)	1 fibre/cm
Para-aramid fibres (Kevlar, Twaron)	1 fibre/cm

Source: Commission de la santé et de la sécurité du travail, Quebec.

On September 26, 1995, Mr. Justice Ian Drost of the British Columbia Supreme Court rendered a landmark judgement in the case *Privest Properties Ltd. et al vs. W.R. Grace & Co. of Canada Ltd. et al* by dismissing, in their entirety, all claims made against the defendants. This "asbestos-in-buildings" lawsuit was the first one to be tried in Canada and the outcome was a clear departure from similar lawsuits in the United States. In the suit, Privest Properties Ltd. alleged that the asbestos-containing product Monokote MK-3 (a sprayed insulation material) posed a health hazard to building occupants and workers. This trial, which lasted two years, was one of the longest to take place in British Columbia. Numerous expert witnesses testified during the 182 court days of the trial. In a 309-page detailed document, Mr. Justice Drost told the plaintiffs that, in his opinion, they failed on all counts they were required to prove. For example, they did not prove that Monokote MK-3 posed a health hazard to workers and occupants of the building. In particular, Mr. Justice Drost accepted the view expressed by Grace experts that "the levels of exposure to asbestos fibres encountered in buildings are far too low to increase the risk of a building worker or occupant contracting any of the asbestos-related diseases, including mesothelioma" and that such exposure "poses no appreciable risk to the health of building occupants." There is no doubt that such a judgment will have an impact on any future asbestos-related suits in Canada and, in particular, suits related to exposure in buildings.

In 1994, the Quebec Commission de la santé et de la sécurité au travail (CSST) amended its regulation on

the quality of the working environment. As a result of this amendment, the exposure limit to air contaminants was lowered for 93 standards, while 96 new standards were added. In all, 660 substances are covered by this new regulation. A sample of the new exposure limits for natural and synthetic fibres is given in the table opposite.

## INTERNATIONAL AND REGULATORY DEVELOPMENTS

### United States

The U.S. Bureau of Mines estimated 1995 Canadian chrysotile imports into the United States at about 23 000 t compared to about 26 000 t in 1994. This drop in U.S. imports from Canada is due mainly to the below-average performance of both the U.S. roofing and friction materials industries which have been affected by the slow growth of the U.S. economy. Canada remains the largest exporter of chrysotile to the United States. Although no longer manufactured in the United States, asbestos-cement pipes are currently being imported from Mexico where there remains an important demand for this product. U.S. exports of chrysotile fibres, mainly to Japan, dropped significantly (28%), mainly due to reduced demand in this country.

The table on the following page is a summary of asbestos-containing products authorized or prohibited in the United States.

The American Conference of Governmental Industrial Hygienists (ACGIH) has again carried forward its notice of intended changes for asbestos in its monograph on Threshold Limit Values. If the values proposed in the notice were to be adopted, organizations following ACGIH guidelines would lower their occupational exposure limit for chrysotile from the current 2 f/cm<sup>3</sup> to a value of 0.2 f/cm<sup>3</sup>. The adoption of a single exposure limit for all asbestos fibres would ignore the scientific evidence that chrysotile carries less risk than other asbestos fibres and the growing recognition that all fibrous materials have different health risk implications. At the urging of several groups, the ACGIH is currently studying the latest scientific information available on the subject. A decision is not expected before the spring of 1997.

In 1995, the U.S. Occupational Safety and Health Administration amended its new asbestos standards for general industry, the construction industry, and the shipyard industry that were published August 10, 1994. These amendments stem from the various court challenges launched by several groups following their 1994 publication. As a result, there will be less stringent requirements for the removal, repair and maintenance of in-place asbestos-containing materials such as roof cement, coatings, mastics and flashings as it was demonstrated that these activities were

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## STATUS OF ASBESTOS PRODUCTS IN THE UNITED STATES

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Asbestos Products  
Banned in the U.S.

Asbestos Products Authorized in the U.S.

Corrugated paper  
Commercial paper  
Flooring felt  
Rollboard  
Specialty paper  
New uses of asbestos

Corrugated asbestos-cement sheet  
Flat asbestos-cement sheet  
Asbestos-cement pipes  
Asbestos-cement shingles  
Friction materials  
Drum brake lining  
Clutch facing  
Disc brake pads  
Asbestos clothing  
Automatic transmission components  
Roofing felt  
Roof coating  
Non-roof coating

Millboard  
Pipeline wrap  
Vinyl asbestos tile  
Acetylene cylinders  
Asbestos diaphragms  
High-grade electrical paper  
Packings  
Sealant tape  
Specialty industrial gaskets  
Arc chutes  
Battery separators  
Reinforced plastic  
Textiles

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not the source of any significant fibre release. A new and improved definition of friable material was included. Modifications were also introduced in the training and health screening requirements.

On November 30, 1995, the U.S. Environmental Protection Agency (EPA) formally removed asbestos-processing facilities (milling, manufacturing and fabrication) from its source category list. This list is to be used for developing new, more stringent regulations under the statutory requirements of the 1990 amendments to the *Clean Air Act* (National Emission Standards for Hazardous Air Pollutants). The EPA acknowledged that actual emissions from processing facilities were "approximately 150 times lower than initially estimated and that the risk to the most exposed individual for both sources is below one in one million." One of the most significant implications of this delisting is that the current "**no visible emissions to the outside air**" standard will continue to apply for asbestos-processing facilities.

As a result of the massive number of litigations over asbestos, Manville Corp. wants to change its name to Schuller International Group Inc. In announcing this name change, the company's chief executive, Thomas Stephens, said "we want the Manville name to disappear in history." The change will require the approval of shareholders and the board. The company expects that this name change will help it distance itself from its previous legal battles. As a result of the litigations, Manville Corp. sought and obtained bankruptcy protection for most of the 1980s and emerged from this protection in 1988.

### Latin America

Brazil is an important producer of chrysotile, especially in the increasingly active market of Latin America. Sociedade Anonima Mineracao do Amianto (SAMA) produced about 180 000 t in 1995. SAMA's

mine is located at Minaçu in the state of Goiás. The company has programs for waste site reforestation, the treatment of mine and mill waste-waters, and dust control (through the use of wet recovery processes).

In 1994, The Asbestos International Association (AIA) established a regional program for Latin American countries, the AIA/CLAS (Confederación Latinoamericana del Asbesto). The objective of the initiative is to foster regional cooperation and identify joint priorities for action in Latin America in the context of broader efforts to gain wider global acceptance of the controlled-use approach for chrysotile. It is a firm commitment on the part of industry in all of the participating countries to implement the International Labour Organization Convention 162 on Safety in the Use of Asbestos.

### Europe

The Zidani chrysotile mine in Greece, which returned to production in 1993 under the terms of a renewable five-year lease to Hellenic Mineral Mining Co. Ltd. (HMMC), produced about 50 000 t of chrysotile fibres in 1995.

In 1995 in France, the issue of asbestos in buildings became a public priority as a result of several articles in the media. The way this issue was raised was, in many respects, very similar to that which resulted in the elimination of the asbestos industry in the United States. As a result, the French government is currently working on two decrees, one from the Department of Labour aimed at workers' protection and the other from the Department of Health to deal with the problem of asbestos in buildings. Details of these decrees are expected to be known in early 1996; however, it can be envisaged that occupational exposure limits to the various types of asbestos will be

reduced and that a program to identify asbestos-containing buildings will be developed. It is evident that the evolution of the situation in France will have repercussions on the future of chrysotile markets, not only in Europe, but also at the world level.

### Biennial Conference of the Asbestos International Association (AIA)

Over 200 delegates from 40 countries attended the 9th AIA Biennial Conference that took place in Montréal May 29-31, 1995. All presentations were centred around the theme of the conference which was "Responsible Use and Environmental Care." The conference not only provided an overview of scientific and regulatory developments, but also placed special emphasis on dust control, environmental management and product technical and performance issues. It was at this conference that mine representatives from Canada, Brazil and Zimbabwe agreed in principle to develop a new range of initiatives on the concept of responsible use (see below).

### Responsible-Use Policy

As follow-up to a 1994 meeting, the chrysotile producers and exporters are moving closer towards the endorsement of a new voluntary policy aimed at increasing workers' protection worldwide. Under this new policy, to be known as the "Responsible Use of Chrysotile," producers and exporters will agree to sell chrysotile only to those users that are in compliance with their respective national regulations or that have submitted a written commitment with an action plan in order to be in full compliance with the national regulations. The Responsible-Use Policy is based on the recognition and acceptance of the principles of the 1986 International Labour Organization Convention 162 and Code of Practice on Safety in the Use of Asbestos. A formal announcement is expected sometime in 1996.

## SCIENTIFIC DEVELOPMENTS

In the second edition (December 1993) of its *Guidelines for Drinking Water Quality*, the World Health Organization (WHO) once again affirms that asbestos in water is not a health hazard. The WHO states that, after years of study, "there is . . . no consistent evidence that ingested asbestos is hazardous to health, and thus . . . there [is] no need to establish a health-based guideline value for asbestos in drinking water." This assessment is consistent with the views of the EPA. The agency stated in 1991 that "asbestos is not classified as a carcinogen in the regulations (Drinking Water Contaminants Rule) because the EPA has determined it is carcinogenic only when inhaled, not ingested." Such statements are encouraging for the continued use of asbestos-cement pipes in developing countries.

## SUBSTITUTES

Non-asbestos fibrous materials, many of which are used as chrysotile substitutes, are coming under increasing scrutiny in the workplace. The 1991 Health Effects Institute-Asbestos Research (HEI-AR) report expressed concern about these substitutes and stated that "in view of the growing numbers of different types of man-made fibres that are entering commerce to substitute for asbestos as a result of the phase-out of asbestos itself, detailed material characterization and biological testing of such fibres should precede their widespread dissemination into the human environment." The recently published *IPCS Environmental Health Criteria 151 - Selected Synthetic Organic Fibres* is also noteworthy in this context. In the conclusions and recommendations section of this report, experts state that "all fibres that are respirable and biopersistent must undergo testing for toxicity and carcinogenicity. Exposures to these fibres should be controlled to the same degree as that required for asbestos until data supporting a lesser degree of control become available." The same experts recommend that "populations potentially exposed to respirable organic fibres should have their exposure monitored in order to evaluate exposure levels and the possible need for additional control measures."

In Canada, as follow-up to a study by Health Canada that determined that Refractory Ceramic Fibres (RCFs) were potentially carcinogenic, Environment Canada has organized an Issue Table aimed at reducing the entrance of RCFs into the environment. A report from this exercise is expected to be released in 1996.

The U.S. EPA is also currently working on a "Significant New Use Rule" (SNUR) for RCFs, which are recognized to be more potent than fibreglass. In 1991, based on animal data, the EPA concluded that RCFs may present an unreasonable risk of cancer to humans and, in mid-1993, it classified RCFs as a "probable human carcinogen." This SNUR would require any person to notify the EPA at least 90 days before commencing the manufacture, import or processing of RCFs. The EPA will hold hearings to help with the identification of significant new RCF product forms and applications.

The European Union has also displayed concern regarding asbestos substitutes (in particular with man-made mineral fibres) and ordered a study of all fibres, both natural and synthetic, which resulted in a moratorium over revision to asbestos regulations in Europe. It is expected that this study will take about two years to complete. At the conclusion of the study, the Commission may decide to make regulatory recommendations concerning all fibres, including asbestos.

In September 1995, the Dutch Expert Committee on Occupational Health Standards concluded that RCFs should be treated as a potential carcinogen with risks to humans, adding their name to a lengthening list of national and international organizations that have clearly stated their concerns over RCFs, as well as over many synthetic fibres.

In Canada, the Fédération des travailleurs et travailleuses du Québec, with the support of the Canadian Labour Congress, completed its Code of Practice with respect to the use of synthetic mineral fibres, and it is now in a pre-publication stage. This exercise was prompted by the recent data from both animals and humans indicating that these materials were dangerous to health. The proposed code would include a description of each synthetic mineral fibre with its known health effects, as well as recommendations for proper monitoring, safe work practices, and exposure limits. This proposed Code of Practice is now being discussed by the various interested parties in order to arrive at a consensus document that could become the Canadian position on this issue. This document would eliminate interprovincial inconsistencies in the protection of workers across Canada.

## OUTLOOK

Indications of increased concerns over some substitutes will continue to help the chrysotile industry over the next couple of years. It is worth noting that litigations against some manufacturers of substitute products appear to be increasing significantly as consumers are concerned about the performance of these substitutes. This is the case, for example, in Denmark, and more recently in the United States. However, increased pressure over chrysotile-containing products, such as that observed in France, may in the medium to long term have a negative impact on the industry.

The benefits and safety of asbestos-cement products continue to be recognized despite increasing competition from substitute fibres and steel. Asian countries are still the main markets for Canadian fibres, accounting for about 60% of Canadian exports in 1995. Japan's share seems to decrease as this country intensifies its move toward the use of longer fibres in chrysotile-containing products. In the short term, this may favour Canadian producers but, in the medium term, will result in reduced demand from Japan as less fibre, in volume, will be needed. It should also be noted that the present recovery of the Japanese economy is a positive factor that may mitigate the consequences of moving to longer fibre. The market in India posted a very strong increase in 1995 and is expected to remain a principal destination for Canadian chrysotile fibres. Indonesia, Malaysia and Thailand continued to be very significant markets in 1995 and are expected to remain so in 1996. In Europe, despite the current situation, France remained a dominant market; however, this market

is expected to lose some momentum as a result of the increased pressure due to the health issues related to the asbestos-in-buildings crisis. Belgium, Spain, Portugal and the United Kingdom continued to be stable markets; however, they will most likely be affected depending upon the outcome of the French situation. Overall, it is expected that chrysotile consumption in Europe will continue to be reduced; this decline could be moderated by concerns regarding substitutes and the aggressive introduction of new products, especially in Spain. The Americas maintained their position as an important destination of Canadian asbestos, accounting for about 20% of Canada's exports. A very significant drop in exports to Mexico was seen in 1995, mainly due to the economic situation in that country. It is expected that the Mexican economy will recover somewhat in 1996. Mexican losses were compensated for by increases in several Latin American countries. For the first time in several years, Cuba again became a destination for Canadian chrysotile. Exports to the United States dropped by 10% from the previous year. South America remains an important focus for future growth. Canadian production and exports of chrysotile are expected to remain stable in 1996 with the potential for a small increase. The aggressive introduction of new chrysotile-containing products to address current health concerns may help turn markets around.

*Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 70. (2) Information in this review was current as of December 31, 1995.*

## TARIFFS

Item No.	Description	Canada			United States
		MFN	GPT	USA	Canada
2524.00.10	Crude asbestos	Free	Free	Free	Free
2524.00.90	Other asbestos	Free	Free	Free	Free
6811.10	Corrugated sheets of asbestos-cement, of cellulose fibre-cement or the like	6.9%	4%	Free	Free
6811.20	Sheets n.e.s., panels/tiles etc. of asbestos-cement, cellulose fibre-cement, etc.	6.9%	4%	Free	Free
6811.30	Tubes, pipes, and tube or pipe fittings of asbestos-cement, of cellulose fibre-cement, etc.	6.9%	4%	Free	Free
6811.90	Articles n.e.s. of asbestos-cement, of cellulose fibre-cement, or the like	6.9%	4%	Free	Free
6812.10	Fabricated asbestos fibres; mixtures with a basis of asbestos or with a basis of asbestos and magnesium carbonate	Free	Free	Free	Free
6812.20	Asbestos yarn and thread	Free	Free	Free	Free
6812.30	Asbestos cords and string, whether or not plaited	Free	Free	Free	Free
6812.40	Asbestos woven or knitted fabric	Free	Free	Free	Free
6812.50	Asbestos clothing, clothing accessories, footwear and headgear	21.3%	x	Free	Free
6812.60	Asbestos paper, millboard and felt	Free	Free	Free	Free
6812.70	Compressed asbestos fibre jointing, in sheets or rolls	Free	Free	Free	Free
6812.90.10	Asbestos belting	Free	Free	Free	Free
6812.90.90	Other asbestos fabricated products n.e.s.	Free	Free	Free	Free
6813.10.10	Asbestos brake linings and pads for motor vehicles of heading nos. 87.02, 87.03, 87.04 or 87.05	9.7%	Free	2.2%	Free
6813.10.90	Other asbestos brake linings and pads	6.9%	5%	1.6%	Free
6813.90.10	Asbestos clutch facings for motor vehicles of heading nos. 87.02, 87.03, 87.04 or 87.05	9.7%	7.5%	2.2%	Free
6813.90.90	Other asbestos friction material and articles n.e.s.	8.0%	1.0%	1.8%	Free

Sources: Customs Tariff, effective January 1996, Revenue Canada; Harmonized Tariff Schedule of the United States, 1996.

n.e.s. Not elsewhere specified; x The Governor in Council may substitute a custom duty rate.

TABLE 1. CANADA, ASBESTOS PRODUCTION AND TRADE, 1994 AND 1995

Item No.	1994		1995P		
	(tonnes)	(\$000)	(tonnes)	(\$000)	
<b>PRODUCTION (Shipments)<sup>1</sup></b>					
By type					
Crude, groups 1, 2 and other milled	—	—	..	..	
Group 3, spinning	8 152	6 774	..	..	
Group 4, shingle	122 606	85 781	..	..	
Group 5, paper	119 104	58 451	..	..	
Group 6, stucco	176 295	59 881	..	..	
Group 7, refuse	104 700	21 834	..	..	
Total	530 857	232 721	510 800	233 676	
By province					
Quebec	524 343	230 676	508 000	232 800	
Newfoundland	6 514	2 045	2 800	879	
Total	530 857	232 721	510 800	233 676	
<b>EXPORTS</b>					
2524.00.10	Crude asbestos				
	Japan	1 791	659	709	405
	United States	343	226	212	59
	Venezuela	17	8	47	24
	Other countries	4	7	—	—
	Total	2 155	901	968	489
2524.00.21	Asbestos milled fibres, Group 3 grades				
	EC countries (12) <sup>1</sup>				
	United Kingdom	735	956	404	526
	Spain	825	1 072	353	456
	Portugal	125	174	166	222
	Germany	44	58	33	43
	France	32	42	1	1
	EC countries, subtotal	1 761	2 302	957	1 248
	Mexico	1 406	1 850	1 226	1 573
	Israel	500	649	625	811
	Turkey	489	634	582	754
	India	338	442	556	740
	Thailand	714	927	377	488
	Brazil	301	413	357	478
	South Korea	523	678	344	445
	Peru	73	97	254	331
	Other countries	1 763	1 667	1 350	1 343
	Total	7 868	9 669	6 628	8 224
2524.00.22	Asbestos milled fibres, groups 4 and 5 grades				
	EC countries (12) <sup>1</sup>				
	France	20 148	16 005	20 985	17 051
	Spain	13 173	12 563	10 508	9 963
	United Kingdom	4 849	4 134	5 743	5 166
	Belgium	4 565	4 068	3 401	3 157
	Portugal	2 190	1 999	2 282	2 200
	Ireland	1 680	1 117	1 395	871
	Denmark	25	17	50	35
	Germany	50	56	24	28
	EC countries, subtotal	46 680	39 959	44 388	38 471
	Thailand	40 664 <sup>r</sup>	30 449 <sup>r</sup>	45 384	34 308
	Japan	26 651 <sup>r</sup>	21 408 <sup>r</sup>	36 702	31 577
	India	16 826	13 512	17 857	14 202
	Colombia	12 737	10 575	12 130	10 867
	Indonesia	16 177 <sup>r</sup>	11 121 <sup>r</sup>	15 105	10 301
	Malaysia	9 188	7 124	9 781	7 425
	Brazil	5 808	5 164	7 517	6 580
	Mexico	16 358	14 372	7 018	6 192
	Algeria	10 700	8 539	6 446	4 875
	Chile	5 167	4 130	5 274	4 393
	Sri Lanka	3 118	2 796	3 887	3 601
	South Korea	1 075	919	5 122	3 187
	Peru	3 299	2 718	3 449	2 913
	Nigeria	3 799	3 332	2 799	2 391
	Morocco	4 515	4 127	2 649	2 340
	Cuba	—	—	2 656	1 857
	United Arab Emirates	2 275	2 187	1 809	1 767
	Pakistan	1 196	1 009	2 107	1 694
	Turkey	897	566	1 984	1 392
	Other countries	13 806	12 297	10 516	9 249
	Total	240 936 <sup>r</sup>	196 420 <sup>r</sup>	244 580	199 604



TABLE 1 (cont'd)

Item No.	1994		1995P		
	(tonnes)	(\$000)	(tonnes)	(\$000)	
<b>EXPORTS (cont'd)</b>					
2524.00.29	Asbestos shorts, groups 6, 7, 8 and 9 grades				
	EC countries (12) <sup>1</sup>				
	France	8 003	2 476	8 992	2 730
	Belgium	4 404	1 666	3 535	1 393
	Spain	3 346	1 440	2 939	1 259
	United Kingdom	2 428	906	2 283	806
	Ireland	1 995	825	1 575	639
	Portugal	1 632	495	1 737	561
	Denmark	425	191	295	143
	Greece	54	10	72	15
	Germany	56	15	36	11
	Netherlands	18	3	-	-
	EC countries, subtotal	22 361	8 027	21 464	7 557
	Japan	62 549r	26 108r	47 667	19 520
	South Korea	40 915	15 398	38 956	14 881
	Thailand	35 920	15 851	30 137	13 263
	India	19 356r	7 881r	24 523	10 447
	United States	24 599	7 013	21 137	6 278
	Indonesia	11 985	4 295r	11 016	4 426
	Colombia	7 583	3 093	10 253	4 136
	Malaysia	9 905r	3 841r	7 528	2 883
	Mexico	10 163	3 506	7 289	2 332
	Brazil	6 966	2 406	6 826	2 174
	Taiwan	3 306r	1 446r	3 477	1 429
	Venezuela	1 642	470	4 383	1 203
	United Arab Emirates	300	141	1 400	1 085
	Other countries	22 844	8 822	21 343	8 116
	Total	280 394r	108 323r	257 399	99 758
	Grand total, crude, milled fibres and shorts	531 353r	315 313r	509 575	308 075
6811.10	Corrugated sheets of asbestos-cement, of cellulose fibre-cement, or the like				
	United States	..	589	..	1 578
	People's Republic of China	-	-	..	11
	Japan	..	8	-	-
	Total	..	597	..	1 589
6811.20	Sheets n.e.s., panels/tiles, etc., of asbestos-cement, cellulose fibre-cement, etc.				
	United States	..	1 784	..	1 569
	Cuba	-	-	..	64
	Finland	..	22	-	-
	Total	..	1 807	..	1 634
6811.30	Tubes, pipes and tube or pipe fittings of asbestos-cement, of cellulose fibre-cement, etc.				
	United States	-	-	..	4
	Total	-	-	..	4
6811.90	Articles n.e.s. of asbestos-cement, of cellulose fibre-cement, or the like				
	Taiwan	-	-	..	85
	United States	..	29	..	33
	El Salvador	..	27	-	-
	Total	..	57	..	119
6812.10	Fabricated asbestos fibres; mixtures with a basis of asbestos or with a basis of asbestos and magnesium carbonate				
	United States	-	-	..	15
	South Korea	..	81	-	-
	Taiwan	..	29	-	-
	People's Republic of China	..	18	-	-
	Mexico	..	17	-	-
	Jamaica	..	5	-	-
	Total	..	151	..	15

TABLE 1 (cont'd)

Item No.	1994		1995P		
	(tonnes)	(\$000)	(tonnes)	(\$000)	
<b>EXPORTS (cont'd)</b>					
6812.20	Asbestos yarn and thread				
	Brazil	5	22	59	265
	Colombia	19	83	36	164
	Czech Republic	12	75	25	130
	Spain	—	—	24	121
	United States	26	191	8	76
	Philippines	10	65	10	61
	Ireland	1	5	1	23
	Other countries	31	145	4	22
	Total	103	589	167	866
6812.30	Asbestos cords and string, whether or not plaited				
	Italy	—	—	..	6
	United States	..	2	..	1
	Total	..	2	..	8
6812.40	Asbestos woven or knitted fabric				
	United Kingdom	61	532	128	937
	United States	31	396	43	563
	Other countries	1	25r	15	111
	Total	93	956r	186	1 616
6812.50	Asbestos clothing, clothing accessories, footwear and headgear				
	Singapore	—	—	..	5
	Egypt	..	126	—	—
	United Kingdom	..	5	—	—
	Total	..	133	..	5
6812.60	Asbestos paper, millboard and felt				
	South Korea	..	223	..	198
	South Africa	—	—	..	38
	United States	—	—	..	9
	Other countries	..	113	..	4
	Total	..	337	..	251
6812.70	Compressed asbestos fibre jointing, in sheets or rolls				
	United States	..	1 082	..	1 020
	Other countries	..	52r	..	99
	Total	..	1 135r	..	1 121
6812.90.10	Asbestos building material, n.e.s.				
	South Korea	..	223	..	41
	United States	—	—	..	39
	Singapore	..	60	..	32
	Other countries	..	473	—	—
	Total	..	759	..	112
6812.90.90	Other asbestos fabricated products n.e.s.				
	Japan	..	59	..	121
	United States	..	231r	..	75
	Cuba	—	—	..	24
	Taiwan	..	30	..	15
	Other countries	..	88	..	7
	Total	..	412r	..	244
6813.10	Asbestos brake linings and pads				
	United States	..	46 638r	..	40 744
	Other countries	..	140	..	60
	Total	..	46 783r	..	40 806
6813.90	Asbestos friction material and articles n.e.s.				
	People's Republic of China	..	30	—	—
	United States	..	22	—	—
	Total	..	53	—	—
Total exports, asbestos manufactured		..	53 771r	..	48 390

TABLE 1 (cont'd)

Item No.	1994		1995 <sup>P</sup>		
	(tonnes)	(\$000)	(tonnes)	(\$000)	
<b>IMPORTS</b>					
2524.00.10	Crude asbestos	896	392	252	288
2524.00.90	Other asbestos	64	46	45	40
6811.10	Corrugated sheets of asbestos-cement, of cellulose fibre-cement, or the like	394	205	175	123
6811.20	Sheets n.e.s., panels/tiles, etc., of asbestos-cement, cellulose-fibre cement, etc.	1 741	1 716	1 193	1 517
6811.30	Tubes, pipes, and tube or pipe fittings of asbestos-cement, cellulose fibre-cement, etc.	270	229	655	526
6811.90	Articles n.e.s., of asbestos-cement, cellulose fibre-cement or the like	77	255	138	532
6812.10	Fabricated asbestos fibres; mixtures with a basis of asbestos or with a basis of asbestos and magnesium carbonate	20	181	35	121
6812.20	Asbestos yarn and thread	2	8	5	24
6812.30	Asbestos cords and string, whether or not plaited	7	41	13	98
6812.40	Asbestos woven or knitted fabric	56	779	56	728
6812.50	Asbestos clothing, clothing accessories, footwear and headgear	19	377	12	281
6812.60	Asbestos paper, millboard and felt	30	279	86	200
6812.70	Compressed asbestos fibre jointing, in sheets or rolls	143	1 414	130	1 513
6812.90.10	Asbestos belting	..	7	..	5
6812.90.90	Other asbestos fabricated products n.e.s.	..	2 335 <sup>r</sup>	..	2 140
6813.10	Asbestos brake linings and pads	..	62 335 <sup>r</sup>	..	59 116
6813.90	Asbestos friction material and articles n.e.s.	..	7 837	..	7 679

Sources: Natural Resources Canada; Statistics Canada.

– Nil; .. Not available or not applicable; n.e.s. Not elsewhere specified; <sup>P</sup> Preliminary; <sup>r</sup> Revised.

<sup>1</sup> EC includes Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain and the United Kingdom.

Note: Numbers may not add to totals due to rounding.

**TABLE 2. CANADIAN CHRYSOTILE PRODUCERS, 1995**

Producers	Mine Location	Normal Mill Capacity		Remarks
		Ore/Day	Fibre/Year	
		(tonnes)		
Teranov Mining Corp.	Baie Verte, Nfld.	6 000	20 000	Wet-processing of tailings started in July 1991. Jointly owned by Black Hill Minerals Ltd. (50%) and Cliff Resources (50%). Did not produce in 1995.
LAB Chrysotile, Inc. <sup>1</sup>				Partnership owned 55% by LAQ and 45% by Mazarin Mining Exploration Inc.
- Lac d'Amiante du Québec, Ltée (LAQ)	Black Lake, Que.	9 000	185 000	Open-pit. Since September 1989, LAQ has been owned by Jean Dupéré (President of LAB Chrysotile) and Connell Bros. Company, Ltd. of the United States.
- Asbestos Corporation Limited British Canadian mine	Black Lake, Que.	7 000	70 000	Sold to Mazarin Mining Exploration Inc. on September 2, 1992. Open-pit. Was closed for indeterminate period in May 1995.
- Bell Asbestos Mines, Ltd.	Thetford Mines, Que.	2 700	80 000	Sold to Mazarin Mining Exploration Inc. on September 2, 1992. Underground. Mine re-opened January 1989.
J.M. Asbestos Inc. Jeffrey mine	Asbestos, Que.	15 000	250 000	Open-pit (effective capacity reduced by one half since 1982).
Total of four producers at year-end			535 000	

<sup>1</sup> A partnership involving three operating companies.

**TABLE 3. CANADA, ASBESTOS PRODUCTION AND EXPORTS, 1985-95**

	Crude	Milled	Shorts	Total
	(tonnes)			
<b>PRODUCTION<sup>1</sup></b>				
1985	—	397 729	352 461	750 190
1986	—	332 092	330 289	662 381
1987	—	365 144	299 402	664 546
1988	14	399 550	310 793	710 357
1989	—	410 588	303 448	714 036
1990	—	379 047	306 580	685 627
1991	—	335 506	350 502	686 008
1992	—	259 819	327 175	586 994
1993	—	235 908	287 059	522 967
1994	—	249 862	280 995	530 857
1995 <sup>P</sup>	..	..	..	510 800
<b>EXPORTS</b>				
1985	44	395 158	326 311	721 513
1986	127	375 948	341 609	717 684
1987	1 696	353 321	293 808	648 825
1988	11 288	381 561	292 236	685 085
1989	17 198	379 601	312 915	709 714
1990	1 469	378 074	269 942	649 485
1991	2 302	353 391	330 360	686 053
1992	1 489	272 013	327 075	600 577
1993	1 739	229 000	279 695	510 434
1994	2 155	248 804 <sup>r</sup>	280 394 <sup>r</sup>	531 353 <sup>r</sup>
1995 <sup>P</sup>	968	251 208	257 399	509 575

Sources: Natural Resources Canada; Statistics Canada.

— Nil; .. Not available; <sup>P</sup> Preliminary.

<sup>1</sup> Producers' shipments.