

Chrysotile

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In 1997, Canadian chrysotile shipments decreased by 11.7% from 1996 levels. Total shipments for 1997 were estimated to be 447 000 t valued at \$224.0 million, compared to revised shipment figures for 1996 of 506 276 t valued at \$256.7 million. Although the average price (for all shipments) decreased by about 1.2%, prices for each fibre category increased by 1-2%. Since the closure of the Baie Verte, Newfoundland, operation in 1994, the Canadian chrysotile industry is concentrated in Quebec.

Canadian exports of chrysotile in 1997 were an estimated 430 242 t. This represents a 14.6% decrease in volume from the previous year. The value of these exports decreased by 16.7% to \$258.1 million.

In 1997, world production of chrysotile is believed to have decreased by about 10% to reach 1.92 Mt. This

decrease is attributable to lower production in most countries, especially in Canada and South Africa where mine closures occurred during the year. Production in other producing countries is expected to have fallen by an average of 15%, with the exception of China where production is thought to be stable.

Due to the closure of the British Canadian operations in Quebec, employment in the Canadian chrysotile industry decreased by about 230 in 1997.

As a consequence of the European ban movement, but foremost because of the Asian financial crisis, worldwide chrysotile consumption will be dramatically reduced in 1998.

CHRYBOTILE 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 then in both 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.

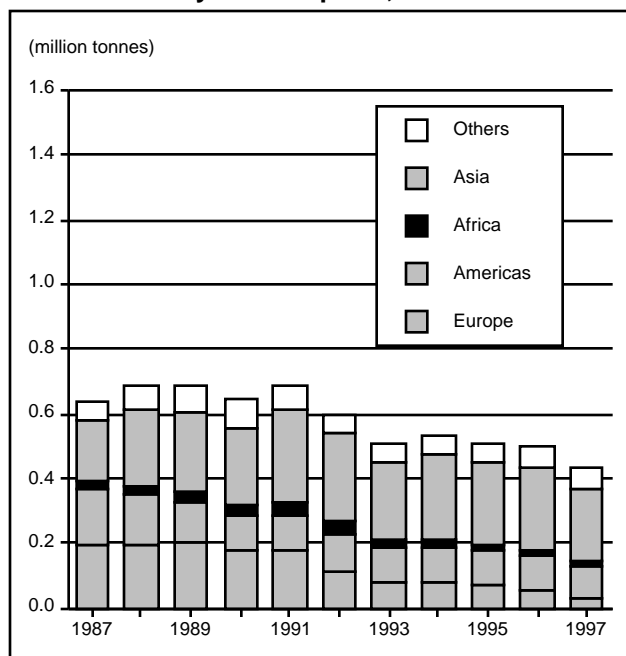
Because of their chemical and physical properties, chrysotile fibres are an extremely useful material that has been, and still is being, widely used throughout the world. In Canada, chrysotile fibres are classified into seven groups, each one with its own sub-categories, with the longest fibres assigned 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 asbestos-cement products (e.g., sheets and mouldings, shingles), gaskets, paper products, vinyl sheet backings, and

CHRYBOTILE, WORLD PRODUCTION BY COUNTRY, 1997

Country	Tonnes ^e
Commonwealth of Independent States	685 000
Canada	447 000
China	250 000
Brazil	208 000
Zimbabwe	142 000
Greece	70 000
Republic of South Africa	50 000
Swaziland	27 000
India	25 000
United States	7 000
Colombia	4 500
Others	4 500
Total	1 920 000

Sources: Natural Resources Canada;
U.S. Geological Survey.
^e Estimated.

Figure 1
Canadian Chrysotile Exports, 1987-97



Sources: Natural Resources Canada; Statistics Canada.

millboards. The shortest fibres (Group 7) are used in moulded brake linings and as a filler in 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 1997, due to the re-opening of the British Canadian operations on July 8, 1996, the production levels of LAB Chrysotile, Inc. (the largest Canadian chrysotile producer) were 1% higher than in 1996, reaching 275 300 t. However, the exhaustion of mine reserves forced the closure of the British Canadian mine on November 1, 1997. Some of the mine's 300 workers were reassigned to LAB Chrysotile's other operations in the area or remained on site for care and maintenance activities. Lower sales in 1997 resulted in a re-stocking of the inventory, which had been drawn down in 1996.

At LAB Chrysotile's Bell mine, which is the only underground chrysotile operation in Canada, current reserves at the 1450 production level will permit operations to continue until 1999. However, the drilling program undertaken in 1995 to delineate further reserves will ensure the mine's life into the next century. To develop these reserves, a new \$30 million project at the 1750 level began in 1997.

At its Black Lake operation, LAB Chrysotile proceeded with a \$40 million slope stabilization project. Reserves at this site are sufficient for the next 13 years at current rates of production. In the meantime, workers at the Black Lake mine signed a new five-year long-term contract, while workers at the Bell mine signed a similar contract last year. During 1997, LAB Chrysotile successfully renewed its ISO 9002 certification on quality assurance.

In 1997, the production level at J.M. Asbestos Inc. declined to 180 000 t, compared to 206 000 t in the previous year. As announced in early 1996, the company proceeded with the first-phase development of an underground operation to extend the life of the Jeffrey mine. The access ramp is completed while work on production and haulage ramps is still being carried out. The finishing touches on the headframe and on the nos. 2 and 3 shafts will be carried out to comply with demand.

The underground mine will start producing in the year 2000. Production at J.M. Asbestos Inc. will then be transferred from the open pit to the underground mine over a period of 12 months. The company proceeded to mine the open pit at an accelerated pace to stockpile the ore necessary to ensure a smooth transition period. The new underground operation will have a maximum capacity of 250 000 t/y of chrysotile fibre until 2020. The capital cost of this development is estimated to be \$125 million. The underground mine project is financed from the operation's cash flows and a revolving loan of \$40 million.

J.M. Asbestos Inc. signed an agreement with Magnolia Metallurgy Inc. to put the company's magnesium-rich tailings at the disposal of the latter. Magnolia Inc., a company mostly owned by Noranda Inc. that is developing a magnesium metal production project in Asbestos, announced that it will start construction of the plant in May 1998.

J.M. Asbestos will be working to obtain ISO 9002 certification on quality assurance and ISO 14 000 certification on environmental protection by 1999.

In northern British Columbia, at the site of the old Cassiar Mining Corporation operations, the Toronto, Ontario-based Mineral Resources Corp. managed to complete a week of commissioning work on its new processing plant before the winter shut-down. The material processed will be used for laboratory tests over the winter at the Centre de Technologie Minérale et de Plasturgie Inc. in Thetford Mines, Quebec. So far the company has spent \$8.7 million on the project and requires a further \$1.7 million-\$2.0 million to begin regular production.

The plant is expected to re-open in May 1998 at a rate of 1000 t per month of fibre. If successful, production will gradually increase to 50 000 t/y of fibre in 2000. The plan calls for the reprocessing of the existing tailings using a proprietary wet milling tech-

nique and, in the process, rehabilitation of the site. The tailings represent a resource of 16 Mt of ore grading 4.4% chrysotile. The company is confident that it will recapture the Asian asbestos-cement sheet and pipe markets it had formerly served.

INTERNATIONAL AND REGULATORY DEVELOPMENTS

United States

The U.S. Geological Survey estimated 1997 Canadian chrysotile imports into the United States at about 21 000 t compared to 22 000 t in 1996. Canada remains the largest exporter of chrysotile to the United States, which also produces chrysotile fibres at the King City Asbestos Corporation (KCAC) New Idria mine near Coalinga, California. Shipments from this mine amounted to about 6900 t in 1997, down from 9550 t in 1996.

In the United States, asbestos was consumed in roofing products (50%), friction products (33%), gaskets (12%) and other products (5%). Although no longer manufactured in the United States, asbestos-cement pipes are currently being imported from Mexico into the United States where there remains an important demand for this product in southwestern states. The United States' main import is, however, asbestos-cement sheets, panels and tiles. U.S. exports of chrysotile fibres, mainly to Japan and Mexico, continued to decline due to reduced demand in these countries. The United States is exporting asbestos-containing products (mostly brake linings and friction material) to several countries, including Australia, Canada, Germany, Japan, the Republic of Korea, Mexico, the United Kingdom and Venezuela.

Despite scientific evidence that chrysotile carries less risk than other asbestos fibres, and the growing recognition that all fibrous materials have different health risk implications, the American Conference of Governmental Industrial Hygienists (ACGIH) adopted, on November 1, 1997, a threshold limit value of 0.1 f/cm³ for all asbestos fibre types. Organizations that follow ACGIH guidelines will be compelled to lower their occupational exposure limit for chrysotile from the current 2 f/cm³ to the new level.

Latin America

Brazil is an important producer of chrysotile, especially for the increasingly active Latin American market. Sociedade Anonima Mineraçao do Amianto (SAMA) produced about 208 400 t in 1997, an increase of 16% over 1996. 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).

The Asbestos International Association (AIA) regional program for Latin American countries, the AIA/CLAS (Confederación Latinoamericana del Asbesto), was very active during the year. The objective of the program 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.

The AIA/CLAS, in collaboration with the Asbestos Institute, carried out a mission to seven Latin American countries (Argentina, Bolivia, Chile, Colombia, Mexico, Peru and Uruguay) from July 14 to 24, 1997. The objectives of the mission were to promote the safe use of chrysotile asbestos, to assist in the implementation of the responsible use policy, and to emphasize the need for better dialogue between industry and governments.

Europe

Greece

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 70 000 t of chrysotile fibres in 1997. The country's asbestos-cement industry operated with a 45 000-t/y finished product capacity in 1997.

France

The French government's decision to ban the import, manufacture and sale of most asbestos products, which was announced on July 3, 1996, became effective January 1, 1997. This decision, based on a report from the Institut National de la Santé et de la Recherche Medicale (INSERM), came amid the signature, in the spring of 1996, of two decrees aimed at dealing with the issue of asbestos in buildings and occupational exposure to asbestos. The decree on occupational exposure had been discussed with the French asbestos industry and, although it was initially acknowledging the difference in potency of the various types of fibres (0.1 f/cm³ for amphiboles and 0.3 f/cm³ for chrysotile effective immediately), this difference was to be eliminated with a single occupational exposure of 0.1 f/cm³ in 1998. The issue of asbestos in buildings was spearheaded by the situation at the Jussieu University, which has a very active anti-asbestos group.

Because the French decision was based on a report from a credible French scientific body, the Government of Canada undertook to have the INSERM report reviewed by a panel of international experts hired by the Royal Society of Canada. The main findings of this review are: (1) that there are no new

scientific data that would justify a change in policy concerning the use of chrysotile asbestos; and (2) that the INSERM report over-estimated the real risks to the French population, mainly because of the lack of realistic exposure data. These findings are very important for Canada as it reinforces its "controlled-use" position that was adopted in the early 1980s.

Following diplomatic exchanges between Canada and France at the end of September 1997, the French government indicated its willingness to have further consultations to resolve the asbestos issue.

As a result of the French ban, the headquarters of the Asbestos International Association located in Paris, France, closed on March 31, 1997, and was re-located in Montréal, Canada, while the office of the executive director remained in Washington, D.C.

European Commission

The European Union's (EU) Member State Working Group of Experts met in Brussels July 22-23, 1997, to: (1) receive a consultant's (Environmental Resources Management Group (ERM)) draft final report on the *Recent Assessments of the Hazards and Risks Posed by Asbestos and Substitute Fibres, and Recent Regulation of Fibres World-Wide*; and (2) address a possible move towards a ban on the use of asbestos. The European Commission (EC) then mandated ERM to look at the socio-economic impact of the issue.

On December 16, 1997, the Directorate General III (Industry) of the EC requested the opinion of the Directorate General XXIV (Consumer Policy and Consumer Health Service) on the ERM report. On February 9, 1998, following its peer review of the ERM report, the Scientific Committee on Toxicity, Ecotoxicity and the Environment (SCTEE) of the Directorate General XXIV stated in its report that, "The ERM report provides no new evidence which indicates that a change in the risk assessment for chrysotile is appropriate." On substitute materials, the SCTEE's comments echoed those from a group of international scientists mandated by the Canadian government and its partners to complete a peer review of the ERM report. In effect, the SCTEE mentioned that ". . . there is no significant epidemiology base to judge the human health risks (of substitutes) . . . hence the conclusion that specific substitute materials pose a substantially lower risk to human health, particularly public health, than the current use of chrysotile, is not well founded . . ."

Despite pressure from the asbestos ban movement that is very active in Europe, the position of the EC on the asbestos issue is still one of controlled use because of concerns related to the perceived risks posed by substitutes. It is also worth noting that on September 9, 1996, following the French ban announcement, the EC (Directorate General V - Employment, Industrial Relations and Social Affairs)

issued a press release indicating that current Commission standards on asbestos exposure in the workplace adequately protect workers' safety.

At the end of 1997, six countries (Belgium, Greece, Ireland, Portugal, Spain and the United Kingdom) remained determined to continue using chrysotile.

United Kingdom

On June 18, 1997, the United Kingdom's Environment Minister, Angela Eagle, announced her government's intention to ban the use and importation of chrysotile asbestos products. To raise Canada's concerns about these intentions, a Canadian delegation of international technical and scientific experts went to the U.K. on September 30, 1997, to give evidence that chrysotile asbestos products can be used safely, and to outline concerns about the use of substitutes. The U.K. confirmed its commitment to follow a due process in the introduction of new legislation to limit the import, supply and use of chrysotile asbestos and to base its decisions on sound science. At year-end, the U.K. Health and Safety Executive was preparing a discussion document for consultation on the possible phasing in of a ban on asbestos products. The discussion document is expected to be finished by early 1998 and new regulations are expected to be in place by 1999.

Other Producers

Asbestos production in the Republic of South Africa decreased to approximately 50 000 t in 1997, about 12% less than in 1996. This drop resulted from lower consumer demand and the closure in early 1997 of the country's last producing crocidolite mine located in the southern Cape Province. The remaining production comes from African Chrysotile Asbestos and two other small operators.

Responsible-Use Policy

To demonstrate its support for the promotion and implementation of the responsible-use policy adopted by the chrysotile producers and exporters of five countries (Brazil, Canada, Swaziland, Zimbabwe and South Africa, the latter of which signed in January 1998), the Canadian government signed, on March 3, 1997, a memorandum of understanding (MOU) in support of the responsible-use policy with Canadian chrysotile producers. This MOU commits the Government to assist the industry in encouraging the governments of asbestos-consuming countries to endorse the responsible-use policy and to develop appropriate regulations where they do not already exist.

The responsible-use policy, a voluntary industry policy aimed at increasing workers' protection worldwide, resulted from a 1994 meeting and was signed in late 1995/early 1996. The ultimate objective of this

new policy, to be known as the "Responsible Use of Chrysotile," is to supply 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 their 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.

The International Conference on the Safe and Responsible Use of Chrysotile Fibres, Montréal, September 16-19, 1997

The International Conference on the Safe and Responsible Use of Chrysotile Fibres was organized by the Government of Canada in partnership with the Government of Quebec, the Asbestos Institute, Quebec labour unions and the Asbestos International Association. This conference attracted 300 delegates representing industry, government and labour unions from 45 chrysotile-producing and consuming countries. It was organized to disseminate information on the safe and responsible use of chrysotile asbestos. During the four days, several speakers presented data on regulation, dust surveys in different industries, and the most recent control technology and work practices. The importance of controlling chrysotile products throughout their whole life cycle was highlighted and several papers were dedicated to the implementation of the safe and responsible use of chrysotile, including case studies in countries where actions have already taken place.

Delegates were briefed on the previous scientific workshop, *Health Effects of Chrysotile Asbestos: Contribution of Science to Risk Management Decisions*, held September 14-16, 1997, in Montréal, which was organized by the Government of Quebec in partnership with the Government of Canada. This workshop reviewed the current database concerning the biological potential of the different asbestos types to determine the risk associated with the use of chrysotile asbestos. The 31 scientists from seven countries participating in the workshop confirmed that chrysotile asbestos is the least potent asbestos fibre and "that there is low risk associated with its usage." It was also mentioned that "chrysotile producers should export their technology and their expertise with their fibre."

Acting on this, bilateral meetings between Canadian representatives and various consuming countries were held at the end of the conference to define the latter's needs for training and technical cooperation. These meetings were in follow-up to Asbestos Institute surveys on present occupational controls in consuming countries.

To support the export of Canadian expertise, Ralph Goodale, federal Minister of Natural Resources

Canada, announced on September 17, 1997, a new quarter-million-dollar three-year training program to help promote the responsible use of chrysotile asbestos in targeted consuming countries. This new training program will provide Canadian expertise to train workers in targeted countries in order to increase their knowledge of safe and responsible chrysotile asbestos manufacturing techniques. Developed by the Asbestos Institute, in cooperation with labour and the governments of Canada and Quebec, the program, which began in October 1997, will promote the International Labour Organization's Convention 162 on Safety in the Use of Asbestos.

International Activities

In parallel with its efforts to assist the Canadian chrysotile industry in the implementation of the producers' responsible-use policy, the Canadian government is also consulting with other chrysotile-producing countries (Brazil, Russia, South Africa, Swaziland and Zimbabwe) in order to develop a strategy to further enhance the promotion of the safe use of chrysotile in consuming countries.

OUTLOOK

As a consequence of the European ban movement, but foremost because of the Asian financial crisis, worldwide chrysotile consumption will be dramatically reduced in 1998. Already felt in 1997 (lower demand in Asian markets was felt starting in mid-1997 and resulted in a decrease in Canadian exports to Asian countries of 13%), the combination of these two factors will result in reduced exports in 1998. Canadian producers, who export about 60% of their production to Asia (while the European market only accounts for about 6%), are expecting a 12-14% drop in their total sales in 1998.

In Europe, the loss of France as a major consumer, and the impact of its ban decision on chrysotile consumption in other European consuming countries, led to a 46% decrease in exports to the area in 1997 compared to 1996. It is, however, comforting to see that the last European countries with a chrysotile industry, particularly Spain, Portugal and Greece, appear determined to continue using the product.

In developing countries, the benefits and safety of chrysotile-cement products continue to be recognized despite increasing competition from substitute fibres and steel. In particular, chrysotile-cement pipes are essential to the distribution of potable water and irrigation in many countries where climatic and economic conditions are not appropriate for substitute products. Asian countries are still the main markets for Canadian fibres, accounting for over 60% of Canadian exports in 1997. Japan remained the preferred destination during the year, retaining a position similar to that of 1996, while exports to Thailand, the

area's second highest, fell by 16%. One of the rare countries to register an increase in 1997, exports to India grew by 3% and are expected to remain strong for the next few years, mainly due to increased demand for infrastructure. Indonesia and the Republic of Korea continued to be very significant markets in 1997, but exports fell by 25% and 27% respectively compared to 1996. Exports to these two countries are expected to stabilize at this level in 1998, and to recover starting in 1999 when the effect of the monetary crisis subsides.

The Americas maintained their position as an important destination for Canadian chrysotile, accounting for about 24% of Canada's exports. In 1997, Mexico posted a 7.5% increase over 1996 as the result of a marked improvement in its economy following the strong downturn of 1995; 1998 exports to Mexico should continue to show the strength of its economy. Canadian exports to Cuba in 1997 remained similar to the 1996 level when it more than doubled compared to 1995 levels; in 1998, Cuba should continue to be an important destination for Canadian

chrysotile. Exports to the United States decreased by about 3% in 1997 compared to 1996, but are expected to remain at similar levels for the coming years. Canadian chrysotile exports to Brazil improved by 9% to 12 872 t compared to 1996, while those to Chile dropped by 31% to 5611 t.

In Africa and the Middle East, Canadian exports fell significantly in 1997, most notably in Algeria, Morocco and Nigeria, after showing some signs of strengthening in 1996. This situation may be the result of social unrest (as in Algeria) or of competitive Russian exports to these regions.

The aggressive introduction of new chrysotile-containing products to address current health concerns may help turn markets around in the medium term.

Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 65. (2) Information in this review was current as of February 9, 1998.

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	5%	Free	Free	Free
6811.20	Sheets n.e.s., panels/tiles etc. of asbestos-cement, cellulose fibre-cement, etc.	5%	Free	Free	Free
6811.30	Tubes, pipes, and tube or pipe fittings of asbestos-cement, of cellulose fibre-cement, etc.	5%	Free	Free	Free
6811.90	Articles n.e.s. of asbestos-cement, of cellulose fibre-cement, or the like	5%	Free	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	15.5%	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	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	7%	Free	Free	Free
6813.10.90	Other asbestos brake linings and pads	5%	5%	Free	Free
6813.90.10	Asbestos clutch facings for motor vehicles of heading nos. 87.02, 87.03, 87.04 or 87.05	Free	Free	Free	Free
6813.90.90	Other asbestos friction material and articles n.e.s.	Free	Free	Free	Free

Sources: Customs Tariff, effective January 1998, Revenue Canada; Harmonized Tariff Schedule of the United States, 1998.

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

TABLE 1. CANADA, ASBESTOS PRODUCTION AND TRADE, 1996 AND 1997

Item No.	1996		1997P		
	(tonnes)	(\$000)	(tonnes)	(\$000)	
PRODUCTION (Shipments)					
By type					
Crude, groups 1, 2 and other milled	—	—	..	..
Group 3, spinning	5 594	6 187	..	..
Group 4, shingle	124 444	100 808	..	..
Group 5, paper	111 150	63 267	..	..
Group 6, stucco	178 139	65 874	..	..
Group 7, refuse	86 949	20 586	..	..
Total	506 276	256 722	447 000	224 000	
By province					
Quebec	504 747	256 334	447 000	224 000	
Newfoundland	1 529	387 928	—	—	
Total	506 276	256 722	447 000	224 000	
EXPORTS					
2524.00.10	Crude asbestos				
	United States	206	55	1 831	497
	Japan	688	267	962	374
	Venezuela	17	6	—	—
	Total	911	328	2 793	871
2524.00.21	Asbestos milled fibres, Group 3 grades				
	EC countries (12) ¹				
	Spain	106	137	248	321
	Portugal	43	57	72	95
	Germany	11	14	11	15
	United Kingdom	4	5	—	—
	EC countries, subtotal	164	213	331	431
	Mexico	1 280	1 656	1 097	1 420
	Turkey	532	691	734	952
	Korea, Republic of	449	580	466	604
	Brazil	364	491	287	387
	Peru	456	596	230	298
	Hungary	159	205	213	276
	India	408	534	185	242
	Thailand	1 680	1 584	175	227
	Other countries	1 151	1 298	550	642
	Total	6 643	7 848	4 268	5 479
2524.00.22	Asbestos milled fibres, groups 4 and 5 grades				
	EC countries (12) ¹				
	Spain	10 033	9 597	7 250	6 841
	Portugal	2 346	2 215	2 219	2 074
	United Kingdom	3 860	3 427	1 792	1 479
	Belgium	2 521	2 347	1 456	1 400
	Ireland	1 121	770	648	416
	Germany	23	29	55	76
	France	10 768	9 018	21	22
	Denmark	13	9	13	9
	EC countries, subtotal	30 685	27 412	13 454	12 317
	Japan	33 207	30 293	35 370	33 026
	Thailand	41 596	31 956	31 655	22 808
	India	17 636	14 152	17 917	14 436
	Mexico	13 458	11 765	13 409	11 135
	Colombia	11 535	10 094	10 416	9 122
	Indonesia	14 905	10 356	9 418	6 560
	Brazil	5 554	4 992	7 154	6 359
	Cuba	6 687	5 071	6 346	4 769
	Sri Lanka	6 057	5 857	4 025	3 962
	Malaysia	4 097	3 443	4 909	3 849
	Korea, Republic of	3 228	2 102	6 046	3 242
	Chile	5 363	4 647	3 652	3 181
	United Arab Emirates	2 747	2 802	2 485	2 310
	Peru	2 521	2 094	2 871	2 300
	Egypt	3 300	3 505	2 123	2 268
	Pakistan	3 922	3 408	2 481	2 091
	Other countries	26 970	22 667	18 968	16 310
	Total	232 468	196 616	192 699	160 045

TABLE 1 (cont'd)

Item No.	1996		1997P		
	(tonnes)	(\$000)	(tonnes)	(\$000)	
EXPORTS (cont'd)					
2524.00.29	Asbestos shorts, groups 6, 7, 8 and 9 grades				
	EC countries (12) ¹				
	Spain	4 692	2 034	2 188	978
	United Kingdom	2 640	941	2 014	696
	Portugal	1 409	429	1 974	612
	Ireland	1 279	539	1 033	411
	Belgium	1 870	829	914	373
	Denmark	213	111	113	57
	Germany	48	26	48	16
	Greece	18	4	36	9
	France	3 135	974	-	-
	EC countries, subtotal	15 304	5 887	8 320	3 152
	Japan	51 493	20 946	48 603	19 647
	Thailand	43 207	19 496	38 455	17 554
	India	24 645	10 815	25 917	11 433
	Korea, Republic of	38 630	14 495	24 187	8 712
	United States	20 899	6 163	18 748	5 559
	Indonesia	12 756	5 371	11 241	4 766
	Mexico	9 577	3 197	11 635	3 903
	Colombia	7 835	3 287	8 108	3 366
	Malaysia	6 045	2 437	5 935	2 389
	Brazil	5 885	2 197	5 431	1 756
	Taiwan	3 885	1 561	5 529	1 470
	Other countries	23 824	9 248	20 373	7 998
	Total	263 985	105 100	230 482	91 705
	Grand total, crude, milled fibres and shorts	504 007	309 892	430 242	258 100
6811.10	Corrugated sheets of asbestos-cement, of cellulose fibre-cement, or the like				
	United States	..	1 543	..	16
	Total	..	1 543	..	16
6811.20	Sheets n.e.s., panels/tiles, etc., of asbestos-cement, cellulose fibre-cement, etc.				
	United States	..	2 123	..	1 247
	Cuba	-	-	..	758
	Japan	-	-	..	94
	Ukraine	-	-	..	26
	Finland	..	21	-	-
	Philippines	..	158	-	-
	Australia	..	11	-	-
	Total	..	2 313	..	2 125
6811.30	Tubes, pipes and tube or pipe fittings of asbestos-cement, of cellulose fibre-cement, etc.				
	United States	-	-	..	5
	Libyan Arab Jamahiriya	..	19	-	-
	Total	..	19	..	5
6811.90	Articles n.e.s. of asbestos-cement, of cellulose fibre-cement, or the like				
	United States	..	16	..	111
	Croatia	..	17	-	-
	People's Republic of China	..	4	-	-
	Total	..	37	..	111
6812.10	Fabricated asbestos fibres; mixtures with a basis of asbestos or with a basis of asbestos and magnesium carbonate				
	Mexico	-	-	..	56
	United States	..	7	..	21
	Taiwan	-	-	..	12
	Total	..	7	..	89

TABLE 1 (cont'd)

Item No.	1996		1997P		
	(tonnes)	(\$000)	(tonnes)	(\$000)	
EXPORTS (cont'd)					
6812.20	Asbestos yarn and thread				
	Brazil	58	276	94	451
	Venezuela	1	6	39	208
	Iran	47	127	29	88
	Czech Republic	1	4	12	67
	United Kingdom	18	107	19	65
	Colombia	9	39	10	44
	United States	7	96	1	21
	Other countries	21	88	1	4
	Total	162	743	205	948
6812.30	Asbestos cords and string, whether or not plaited				
	United States	..	30	..	23
	Total	..	30	..	23
6812.40	Asbestos woven or knitted fabric				
	United Kingdom	94	774	108	899
	United States	30	391	30	387
	Philippines	-	-	10	160
	Other countries	1	6	13	117
	Total	125	1 171	161	1 563
6812.50	Asbestos clothing, clothing accessories, footwear and headgear				
	Cuba	..	17	..	18
	Japan	..	20	-	-
	Other countries	..	24	-	-
	Total	..	61	..	18
6812.60	Asbestos paper, millboard and felt				
	United States	..	5	-	-
	Switzerland	..	56	-	-
	Total	..	61	-	-
6812.70	Compressed asbestos fibre jointing, in sheets or rolls				
	United States	..	945	..	1 028
	Other countries	..	200	..	262
	Total	..	1 145	..	1 290
6812.90.10	Asbestos building material, n.e.s.				
	China	-	-	..	59
	United States	-	-	..	11
	Other countries	..	38	..	-
	Total	..	38	..	70
6812.90.90	Other asbestos fabricated products n.e.s.				
	United States	..	107	..	114
	Other countries	..	16	..	66
	Total	..	123	..	180
6813.10	Asbestos brake linings and pads				
	United States	..	35 483	..	43 192
	Other countries	..	483	..	294
	Total	..	35 966	..	43 486
6813.90	Asbestos friction material and articles n.e.s.				
	Venezuela	-	-	..	43
	United States	..	31	..	7
	People's Republic of China	..	4	-	-
	Peru	..	9	-	-
	Total	..	44	..	50
Total exports, asbestos manufactured		..	43 301	..	49 974

TABLE 1 (cont'd)

Item No.		1996		1997P	
		(tonnes)	(\$000)	(tonnes)	(\$000)
IMPORTS					
2524.00.10	Crude asbestos	242	55	80	42
2524.00.90	Other asbestos	111	133	48	33
6811.10	Corrugated sheets of asbestos-cement, of cellulose fibre-cement, or the like	168	147	198	154
6811.20	Sheets n.e.s., panels/tiles, etc., of asbestos-cement, cellulose-fibre cement, etc.	1 278	1 424	1 144	1 410
6811.30	Tubes, pipes, and tube or pipe fittings of asbestos-cement, cellulose fibre-cement, etc.	498	438	488	436
6811.90	Articles n.e.s., of asbestos-cement, cellulose fibre-cement or the like	104	427	113	585
6812.10	Fabricated asbestos fibres; mixtures with a basis of asbestos or with a basis of asbestos and magnesium carbonate	14	79	13	164
6812.20	Asbestos yarn and thread	3	17	2	10
6812.30	Asbestos cords and string, whether or not plaited	8	54	15	80
6812.40	Asbestos woven or knitted fabric	52	763	40	551
6812.50	Asbestos clothing, clothing accessories, footwear and headgear	8	211	11	264
6812.60	Asbestos paper, millboard and felt	..	224	..	278
6812.70	Compressed asbestos fibre jointing, in sheets or rolls	109	1 246	127	1 508
6812.90.10	Asbestos belting	..	2	..	5
6812.90.90	Other asbestos fabricated products n.e.s.	..	2 002	..	2 439
6813.10	Asbestos brake linings and pads	..	60 901	..	68 758
6813.90	Asbestos friction material and articles n.e.s.	..	7 090	..	8 236

Sources: Natural Resources Canada; Statistics Canada.

– Nil; .. Not available or not applicable; n.e.s. Not elsewhere specified; P Preliminary.

1 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 CHRYBOTILE PRODUCERS, 1997

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 Corporation (50%). Did not produce since 1994.
LAB Chrysotile Inc. ¹				Partnership owned 55% by LAQ and 45% by Mazarin Mining Corporation 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	55 000	Sold to Mazarin Mining Exploration Inc. on September 2, 1992. Open-pit. Re-opened on July 8, 1996, on a slightly smaller scale; to close again on November 1, 1997.
- Bell Asbestos Mines, Ltd.	Thetford Mines, Que.	2 700	100 000	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			590 000	

¹ A partnership involving three operating companies.

TABLE 3. CANADA, ASBESTOS PRODUCTION AND EXPORTS, 1985-97

	Crude Asbestos	Milled Fibres	Short Fibres	Total
(tonnes)				
PRODUCTION¹				
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	—	255 621	259 932	515 553
1996	..	241 188	265 088	506 276
1997 ^P	..	..	..	447 000
EXPORTS				
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	280 394	531 353
1995	968	251 251 ^r	257 356	509 575
1996	911	239 111	263 985	504 007
1997 ^P	2 793	196 967	230 482	430 242

Sources: Natural Resources Canada; Statistics Canada.

— Nil; .. Not available; ^p Preliminary; ^r Revised.

¹ Producers' shipments.