ASBESTOS

By Robert L. Virta[1]

Asbestos-related health risk was the major issue affecting the domestic asbestos industry as the Environmental Protection Agency (EPA) continued to review its proposed ban/phaseout of asbestos and asbestos-containing products. In the United States, production, imports, exports, and apparent consumption of asbestos declined in 1988, continuing a 15-year downward trend.

DOMESTIC DATA COVERAGE

Domestic production data for asbestos are developed by the Bureau of Mines by means of a voluntary industry survey. Of the two canvassed operations to which a survey request was sent, both responded, representing 100% of the total production data shown in table 1.

LEGISLATION AND GOVERNMENT PROGRAMS

EPA completed a regulatory impact analysis of its proposed ban and/or phaseout of asbestos and asbestos-containing products and submitted its recommendations concerning the proposal to the Office of Management and Budget for review.[2]

The Occupational Safety and Health Administration (OSHA) amended its ruling covering occupational exposure to asbestos, tremolite, anthophyllite, and actinolite (29 CFR Parts 1910 and 1926) to include an exposure limit of 1 fiber per cubic centimeter of air averaged over a 30-minute time period.[3]

On February 16, 1988, the EPA issued a final ruling that contained the toxic chemical release inventory reporting form as required by Section 313 of the Superfund Amendments and Reauthorization Act of 1986 (SARA). SARA requires the owners and operators of facilities that manufacture, import, process, or use certain toxic chemicals to report annually any releases of those chemicals to the environment. The ruling also requires suppliers to notify purchasers of compounds and trade name products of the presence of those toxic chemicals. Friable asbestos was included under the ruling.[4]

OSHA extended through July 21, 1989, an administrative stay on its 1986 regulation governing worker exposure to the nonasbestiform varieties of tremolite, actinolite, and anthophyllite. During the stay, OSHA continued to analyze the impact of using the asbestos standard to regulate the nonasbestiform varieties of the minerals.[5]

ENVIRONMENTAL IMPACT

EPA released a report on asbestos-containing materials in public buildings. In this report, EPA recommended improved training for inspection and abatement professionals, planned

TABLE 1

SALIENT ASBESTOS STATISTICS

		1984	1985	1986	1987	1988
United States:						
Production (sales):						
Quantity	metric tons	57,422	57,457	51,437	50,600	18,233
Value[1]	thousands	$24,238	$20,485	$17,367	$17,198	W
Exports and reexports (unmanufactured):						
Quantity	metric tons	39,919	45,656	47,281	60,084	31,544
Value	thousands	$18,346	$16,489	$14,520	$16,149	$8,468
Exports and reexports of asbestos products:						
Value	do.	$163,347	$193,765	$163,896	$180,602	$194,858
Imports for consumption (unmanufactured):						
Quantity	metric tons	209,963	142,431	108,352	93,763	85,326
Value	thousands	$64,749	$44,093	$26,537	$22,022	$21,528
Consumption, apparent[2]	metric tons	226,000	162,000	119,627	84,279	71,354
World: Production	do.	r4,311,842	r4,271,488	4,053,585	p4,253,194	e4,357,742

e Estimated. p Preliminary. r Revised. W Withheld to avoid disclosing company proprietary data.
[1] F.o.b. mine.
[2] Production, plus imports, minus exports, plus adjustments in Government and industry stocks.

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management programs for asbestos abatement activities, increased attention to thermal insulation applications, and assessment of the effectiveness of the Asbestos Hazard Emergency Response Act prior to establishing any new programs for asbestos control.[6]

TABLE 2

STOCKPILE GOALS AND GOVERNMENT INVENTORIES FOR ASBESTOS, DECEMBER 31

(Metric tons)

	Stock-pile goals	Total inventories		
		1986	1987	1988
Amosite	15,422	30,853	30,849	30,849
Chrysotile	2,722	9,711	9,709	9,710
Crocidolite	—	33	33	33
Total	**18,144**	**40,597**	**40,591**	**40,592**

Source: Department of Defense.

TABLE 3

U.S. ASBESTOS CONSUMPTION, BY END USE, GRADE, AND TYPE

(Thousand metric tons)

End use	Chrysotile[1]						Cro-cido-lite	Other[3]	Total asbes-tos[2 4]
	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Total[2]			
1987	1.0	7.8	6.5	7.3	56.8	79.3	1.1	3.8	80.4
1988:									
Asbestos-cement pipe	—	6.9	1.4	2.2	—	10.4	1.3	—	11.6
Asbestos-cement sheet	—	—	—	2.0	2.0	4.0	—	—	4.0
Coatings and compounds	(5)	(5)	—	—	3.7	3.7	—	—	3.7
Flooring products	—	—	.1	—	.2	.3	—	—	.3
Friction products	(5)	(5)	2.0	.8	11.9	14.8	—	—	14.8
Insulation:									
Electrical	—	—	(5)	—	—	(5)	—	—	(5)
Thermal	—	—	(5)	(5)	(5)	(5)	—	—	(5)
Packing and gaskets	—	.5	1.5	(5)	7.4	9.5	—	—	9.5
Paper	—	—	—	—	1.2	1.2	—	—	1.2
Plastics	—	(5)	—	—	.3	.3	—	—	.3
Roofing products	—	(5)	(5)	.2	19.6	19.9	—	—	19.9
Textiles	.4	—	—	—	—	.4	—	—	.4
Other	(5)	.1	(5)	—	.2	.4	—	—	.4
Total[2]	**.4**	**7.6**	**5.1**	**5.4**	**46.4**	**65.0**	**1.3**	**5.1**	**66.2**

[1] Estimated distribution based upon data provided by the Asbestos Institute, Montreal, Canada, and the Bureau of Mines asbestos producer survey.
[2] Data may not add to totals shown because of independent rounding.
[3] Source: Bureau of the Census. "Other" category contains unspecified fiber type and end use.
[4] Does not include "Other" category in total.
[5] Less than 1/10 unit.

The International Labor Organization (ILO) provision that supports the controlled use of asbestos was ratified by the Canadian Government on June 16. With its ratification by Canada, the ILO provision will become part of the International Labor Code on June 16, 1989.[7]

Stockpile goals for asbestos were unchanged from those of 1987.

DOMESTIC PRODUCTION

The producers of asbestos were KCAC Inc., San Benito County, CA, and Vermont Asbestos Group Inc., Orleans County, VT. Domestic production decreased significantly in 1988 with the closing of Calaveras Asbestos Corp. in 1987. Vermont Asbestos Group announced plans to apply for permits to open a landfill for asbestos-containing wastes on its property in Eden. The company would use an abandoned open pit for the disposal of wastes generated from asbestos abatement programs.[8]

CONSUMPTION AND USES

Total U.S. asbestos consumption decreased 15% in 1988. Approximately 91% of the asbestos consumed was chrysotile, 2% was crocidolite, and 7% was an unspecified fiber type. Chrysotile grade 7 was most commonly used, followed by grades 4, 6, 5, and 3. Asbestos-cement pipe, friction products, packing and gaskets, and roofing products accounted for 84% of the asbestos consumption.

PRICES

The average unit value of domestically produced asbestos increased in 1988. Unit values for imported asbestos

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ranged from $115 per ton to $2,849 per ton and averaged $252 per ton. Unit values for exported asbestos ranged from $163 per ton to $3,906 per ton and averaged $268 per ton.

FOREIGN TRADE

There was a 3% increase in the total value of asbestos fibers and asbestos products exported from the United States. Exports and reexports of asbestos fiber decreased 48% in quantity and value. The value of exported and reexported manufactured products increased 8%. Exports and reexports of brake linings and disc pads accounted for 72% of the value of all manufactured asbestos products. Canada remained the largest importer of unmanufactured fibers and manufactured asbestos products, followed by Japan, Mexico, Brazil, and Australia.

Canada provided 93% of the asbestos imported into the United States, and the Republic of South Africa provided 5%. Several other countries provided minor amounts. Chrysotile accounted for approximately 93% of asbestos fiber imports.

Imports of asbestos-containing pipes, tubes, and fittings increased from 2,152 tons in 1987 to 7,757 tons in 1988 according to the Bureau of the Census. Imports of other asbestos-containing products decreased from 5,100 tons in 1987 to 2,756 tons in 1988.

WORLD CAPACITY

The data in table 8 are rated annual capacity for mines and refineries as of December 31, 1988. Rated capacity is defined as the maximum quantity of product that can be produced in a period of time on a normally sustainable long-term operating rate, based on the physical equipment of the plant, and given acceptable routine operating procedures involving labor, energy, materials, and maintenance. Capacity includes both operating plants and plants temporarily closed that in the judgment of the author can be brought into production within a short period of time with minimum capital expenditure.

TABLE 4

CUSTOMS UNIT VALUES OF IMPORTED ASBESTOS

(Dollars per metric ton)

	1984	1985	1986	1987	1988
Canada:					
Chrysotile:					
Cement	284	—	—	—	—
Crude	1,084	576	547	610	635
Spinning	699	731	507	598	756
Other	431	283	229	218	227
South Africa, Republic of:					
Amosite	869	830	—	—	—
Crocidolite	705	569	582	572	609

Source: Bureau of the Census.

TABLE 5

COUNTRIES IMPORTING U.S. ASBESTOS FIBERS AND PRODUCTS

(Thousand dollars)

Country	1987			1988		
	Unmanufactured fibers	Manufactured products	Total[1]	Unmanufactured fibers	Manufactured products	Total[1]
Australia	24	1,513	1,537	9	2,285	2,294
Brazil	401	4,642	5,043	656	4,662	5,317
Canada	673	136,828	137,501	694	144,305	144,999
Germany, Federal Republic of	673	1,975	2,648	228	2,316	2,544
Japan	3,604	5,931	9,535	3,312	8,538	11,850
Korea, Republic of	1,579	991	2,569	182	1,266	1,448
Kuwait	—	132	132	—	456	456
Mexico	2,893	6,720	9,613	1,636	7,677	9,313
Saudi Arabia	—	1,329	1,329	—	1,814	1,814
Thailand	3,028	397	3,425	150	757	908
Turkey	—	279	279	—	706	706
United Kingdom	359	1,949	2,307	97	2,127	2,224
Venezuela	257	2,314	2,571	106	1,805	1,912
Other	2,659	15,602	18,261	1,399	16,143	17,542
Total[1]	**16,149**	**180,602**	**196,751**	**8,468**	**194,858**	**203,326**

[1] Data may not add to totals shown because of independent rounding.
Source: Bureau of the Census.

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TABLE 6

U.S. EXPORTS AND REEXPORTS OF ASBESTOS AND ASBESTOS PRODUCTS

Products		1986		1987		1988	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
EXPORTS							
Unmanufactured:							
Crudes, fibers, stucco	metric tons	30,252	$9,728	39,720	$11,151	26,146	$6,727
Sand and refuse	do.	16,645	4,673	19,416	4,666	5,188	1,683
Total[1]	**do.**	**46,897**	**14,401**	**59,136**	**15,818**	**31,334**	**8,410**
Manufactured:							
Asbestos fibers	do.	723	3,902	1,078	4,761	1,388	5,377
Brake linings and disk brake pads	do.	NA	123,515	NA	133,733	NA	139,217
Clutch facings and linings	number	NA	16,187	NA	19,982	NA	26,361
Gaskets	metric tons	266	1,285	471	1,857	530	2,225
Insulation	do.	NA	1,889	NA	3,700	NA	4,553
Packing and seals	do.	820	6,373	659	5,710	638	5,781
Shingles and clapboard	do.	880	805	1,225	605	1,095	662
Other articles of asbestos	do.	1,614	1,553	1,632	2,132	1,591	2,056
Other articles, n.s.p.f.	do.	NA	7,342	NA	6,473	NA	6,613
Total[1]		**XX**	**162,851**	**XX**	**178,953**	**XX**	**192,846**
REEXPORTS							
Unmanufactured:							
Crudes and fibers	do.	329	98	904	316	210	58
Sand and refuse	do.	54	20	44	15	—	—
Total[1]	**do.**	**384**	**119**	**948**	**331**	**210**	**58**
Manufactured:							
Asbestos fibers	do.	—	—	27	65	6	54
Brake linings and disk brake pads	do.	NA	222	NA	333	NA	969
Clutch facings and linings	number	NA	604	NA	845	NA	733
Gaskets	metric tons	6	65	—	—	6	19
Insulation	do.	NA	23	—	—	NA	5
Packing and seals	do.	([2])	50	([2])	3	3	12
Other articles of asbestos	do.	NA	3	3	143	18	77
Other articles, n.s.p.f.	do.	NA	78	NA	260	NA	144
Total[1]		**XX**	**1,045**	**XX**	**1,649**	**XX**	**2,012**

NA Not available. XX Not applicable.
[1] Data may not add to totals shown because of independent rounding.
[2] Less than 1/2 unit.
Source: Bureau of the Census.

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WORLD REVIEW

Canada continued to be the largest market economy producer of asbestos, followed by Brazil, the Republic of South Africa, and Italy. The U.S.S.R. was the world's largest producer of asbestos. Canada and the U.S.S.R. accounted for approximately 76% of the world production.

Brazil

SA Mineracao de Amianto announced plans to begin operation of a 250,000-ton-capacity mill at the Cana Brava Mine. The company produces asbestos grades 4 to 6. The ore contains 7% to 8% chrysotile asbestos.[9]

Canada

Canadian production increased in 1988 to an estimated 705,000 tons, a 6% increase over 1987. Prices for asbestos fiber also increased slightly in 1988 as demand for Canadian asbestos remained strong. Developing countries, particularly in Asia, were major markets for Canadian asbestos, accounting for approximately 42% of Canadian asbestos sales.[10]

Cassiar Mining Corp. began an underground development program at its McDame Mine in British Columbia. The ore in the currently operating surface mine is expected to be exhausted by the early 1990's. Production from the underground mine is expected to begin in 1991 at an annual production rate of 90,000 tons per year. The company will continue to produce asbestos grades 3 to 6 although approximately 70% of the asbestos produced from the mine will be grade 4.[11]

Baie Verte Mines Inc. received additional funding from the Newfoundland Government and Minerals Commodities Ltd. and began finalizing a program for expansion of its open pit mine in Newfoundland. The expansion will permit access to an additional 5 years of minable reserves at current production rates. The company also began planning for the installation of a 20,000-ton-per-year wet-processing plant. The plant will produce a grade 5 product in pellet form.[12]

[1] Physical scientist, Branch of Industrial Minerals.

[2] Asbestos Information Association News & Notes. EPA Forwards Draft Final Rule to OMB for Review. Dec. 30, 1988, p. 1.

[3] Federal Register. Occupational Safety and Health Administration. Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite. V. 53, No. 178, Sept. 14, 1988, pp. 35610–35629.

[4] ———. Environmental Protection Agency. Toxic Chemical Release Reporting; Community Right-to-know. V. 53, No. 30, Feb. 16, 1988, pp. 4500–4554.

[5] ———. Occupational Safety and Health Administration. Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite. V. 53, No. 139, July 20, 1988, pp. 27345–27346.

[6] Environmental Protection Agency. EPA Study of Asbestos-containing Materials in Public Buildings, A Report to Congress, Feb. 1988. U.S. EPA, Washington, DC, 1988, 115 pp.

[7] Asbestos Information Association News & Notes. Canada Ratifies ILO Agreement on Controlled Use of Asbestos. June 30, 1988, p. 4.

[8] Crowe, N. Asbestos Landfill Planned. Burlington Free Press, Aug. 12, 1988.

[9] Asbestos. Brazilian Mine Living Up to Safe Use. V. 3, No. 1, 1988, p. 4.

[10] Freeman, A. Canadian Asbestos Mining Enjoys a Modest Recovery. Wall St. J., Mar. 10, 1989, p. B2.

[11] Industrial Minerals (London). Cassiar Asbestos Development. No. 245, Feb. 1988, p. 8.

[12] ———. Baie Verte Asbestos Developments. No. 247, Apr. 1988, p. 17.

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TABLE 7

U.S. IMPORTS FOR CONSUMPTION OF ASBESTOS FIBERS, BY TYPE, ORIGIN, AND VALUE

Type	Canada		South Africa, Republic of		Other		Total [1]	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
1986	103,517	$23,814	4,455	$2,506	380	$217	108,352	$26,537
1987:								
Chrysotile:								
Crude	19	12	10	11	15	17	44	40
Spinning fibers	589	352	—	—	15	45	604	397
All other	88,107	19,207	44	57	22	5	88,173	19,269
Crocidolite (blue)	—	—	1,113	637	—	—	1,113	637
Other (unspecified asbestos type)	1,509	526	2,079	1,083	241	70	3,829	1,679
Total [1]	**90,224**	**20,096**	**3,246**	**1,788**	**293**	**137**	**93,763**	**22,022**
1988:								
Chrysotile:								
Crude	20	2	—	—	17	21	37	23
Spinning fibers	526	358	—	—	75	97	601	455
All other	77,779	17,421	488	273	61	73	78,328	17,767
Crocidolite (blue)	—	—	1,252	763	—	—	1,252	763
Other (unspecified asbestos type)	1,365	555	2,548	1,480	1,195	484	5,108	2,520
Total [1]	**79,690**	**18,336**	**4,288**	**2,516**	**1,348**	**676**	**85,326**	**21,528**

[1] Data may not add to totals shown because of independent rounding.
Source: Bureau of the Census.

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TABLE 8

WORLD ASBESTOS ANNUAL PRODUCTION CAPACITY, DECEMBER 31, 1988

	Rated capacity[1] (Thousand metric tons)
Chrysotile:	
North America:	
Canada	780
United States	30
Total	**810**
South America:	
Brazil	250
Colombia	20
Other	1
Total	**271**
Europe:	
Greece	100
Italy	150
U.S.S.R.	2,800
Yugoslavia	20
Total	**3,070**
Africa:	
South Africa, Republic of	150
Swaziland	30
Zimbabwe	250
Total	**430**
Asia:	
China	170
Cyprus	35
India	30
Japan	4
Korea, Republic of	5
Turkey	6
Other	(2)
Total	**250**
World chrysotile total	**4,831**
Crocidolite: South Africa, Republic of	210
Amosite: South Africa, Republic of	110

[1] Includes capacity at operating plants as well as at plants on standby basis.
[2] Less than 1/2 unit.

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TABLE 9

ASBESTOS: WORLD PRODUCTION, BY COUNTRY[1]

(Metric tons)

Country[2]	1984	1985	1986	1987[p]	1988[e]
Argentina	1,093	1,244	1,697	1,200	1,200
Brazil[3]	134,788	165,446	204,460	212,807	230,000
Bulgaria	500	400	300	400	400
Canada (shipments)	[r]836,654	[r]750,190	662,381	664,546	[4]704,989
China[e]	135,000	150,000	150,000	150,000	150,000
Colombia	9,982	12,435	[e]13,000	[e]13,000	10,000
Cyprus	[r]11,298	16,360	13,011	18,070	13,000
Egypt	389	229	476	209	215
Greece	45,376	46,811	51,355	63,000	80,000
India	25,450	30,183	25,236	27,019	25,000
Indonesia[e]	25,000	25,000	25,000	25,000	25,000
Italy	147,272	136,006	115,208	100,834	120,000
Japan	3,140	2,971	3,593	3,143	3,200
Korea, Republic of	8,062	4,703	2,983	2,518	2,500
Mozambique	[e]400	55	—	—	—
South Africa, Republic of	167,389	164,247	138,862	135,074	[4]145,405
Swaziland	25,832	25,130	20,908	25,925	23,000
Taiwan	1,355	625	—	—	—
Turkey	1,499	[e]1,500	1,098	360	100
U.S.S.R.[e]	2,500,000	2,500,000	2,400,000	[4]2,554,600	2,600,000
United States (sold or used by producers)	57,422	57,457	51,437	50,600	[4]18,233
Yugoslavia	8,556	6,916	8,596	10,964	15,500
Zimbabwe	165,385	173,580	163,984	193,925	190,000
Total	**[r]4,311,842**	**[r]4,271,488**	**4,053,585**	**4,253,194**	**4,357,742**

[e]Estimated. [p]Preliminary. [r]Revised.

[1]Table includes data available through Apr. 26, 1989.

[2]In addition to the countries listed, Afghanistan, Czechoslovakia, North Korea, and Romania also produce asbestos, but output is not officially reported, and available general information is inadequate for the formulation of reliable estimates of output levels.

[3]Excludes direct sales of run-of-mine material, in metric tons, of: 1984—141; 1985—887; 1986—2,060; 1987—2,000 (estimated); and 1988—2,000 (estimated).

[4]Reported figure.

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