

Gypsum and Anhydrite

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INTRODUCTION

Pure gypsum, hydrous calcium sulphate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), is a fine-grained white mineral that occasionally is grey or brown in its impure state. When gypsum is processed, it is ground to a fine powder, called landplaster, and then heated in a calcining kettle at 280°-320°C to drive off 75% of the contained water, forming calcium sulphate hemihydrate ($\text{CaSO}_4 \cdot 0.5\text{H}_2\text{O}$), commonly called stucco. When stucco is recombined with water, it dries and hardens into a variety of shapes. The most common form of gypsum, β -gypsum (beta-gypsum), is calcined under atmospheric pressure. A more refined product, α -gypsum (alpha-gypsum), is produced in a reactor under elevated pressures. It is used for specialized applications such as dental molds. When it is applied between two layers of paper, calcined gypsum forms wallboard that has unique fire-resistance and insulation properties. Gypsum is one of the oldest building materials known, having first been used around 6000 B.C. in Anatolia (modern-day Turkey). The Egyptians used gypsum plaster as a jointing material during construction of the Pyramids. In the 1700s, France started to make extensive use of "Plaster of Paris" in the interior walls of wooden homes as protection against fire. Uncalcined gypsum is used in cement manufacturing and as a fertilizer and soil conditioner.

CANADIAN INDUSTRY

Natural gypsum is mined in five provinces in Canada, as shown in Figure 1. Shipments of natural gypsum from Canadian mines in 2004 totaled 9.34 Mt valued at \$114 million (Table 1). This amount compares to 8.38 Mt valued at \$108 million in 2003, representing an 11.5% increase in shipments and a 5.5% increase in total value of shipments. Figure 2 shows the trend in production since

1992, with a general upturn since 2001. Canadian production has reached the same level as last seen in 1999.

Five major companies operated a total of 10 mines and 12 wallboard plants during the year, accounting for an estimated 1900 employees. The gypsum mines and related wallboard production plants are listed in Table 2.

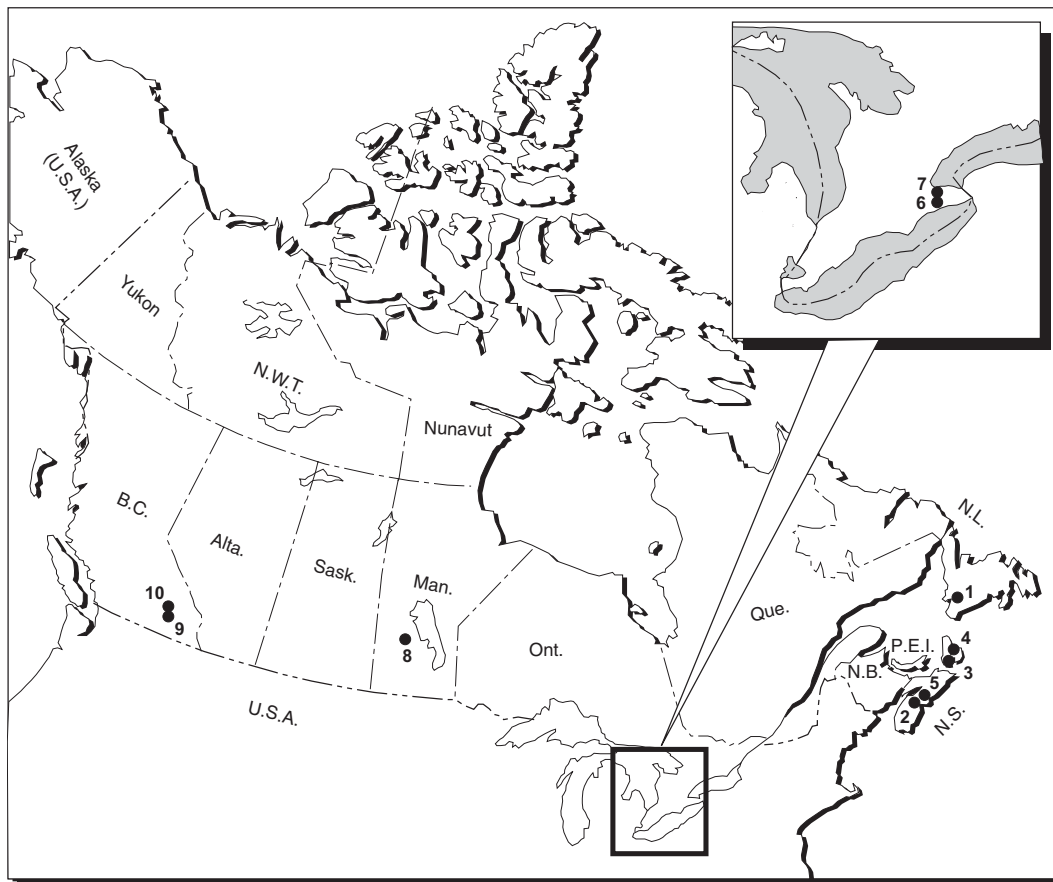
National Gypsum (Canada) Ltd. is the leading producer of gypsum in Canada from its open-pit mine at Milford Station, north of Halifax, Nova Scotia. In 2004, the company celebrated 50 years of mining at the Milford deposit. Gypsum ore from this deposit supplies eight eastern seaboard plants owned by National Gypsum. Other companies that mine gypsum in Nova Scotia include: Fundy Gypsum Co. and Little Narrows Gypsum Co., both subsidiaries of USG Canadian Mining Ltd., as well as Georgia-Pacific Canada, Inc., from the Melford deposit. Total production from gypsum mines in Nova Scotia was 7.87 Mt, an increase of 16% over 2003 levels.

BPB Canada Inc., Georgia-Pacific and CGC Inc. all have integrated gypsum mining and wallboard manufacturing facilities in various provinces. Georgia-Pacific closed its Caledonia, Ontario, mine in May 2004 as the grade of gypsum, around 70%, was not of sufficient quality for wallboard manufacture. Gypsum ore for the wallboard plant at Caledonia is now being shipped from Nova Scotia. CGC Inc. closed its joint compound plant in Edmonton, Alberta, in mid-2004.

According to the Gypsum Association, Canadian wallboard manufacturers shipped 3.55 billion sq. ft. of wallboard in 2004, up 3.8% from 2003.

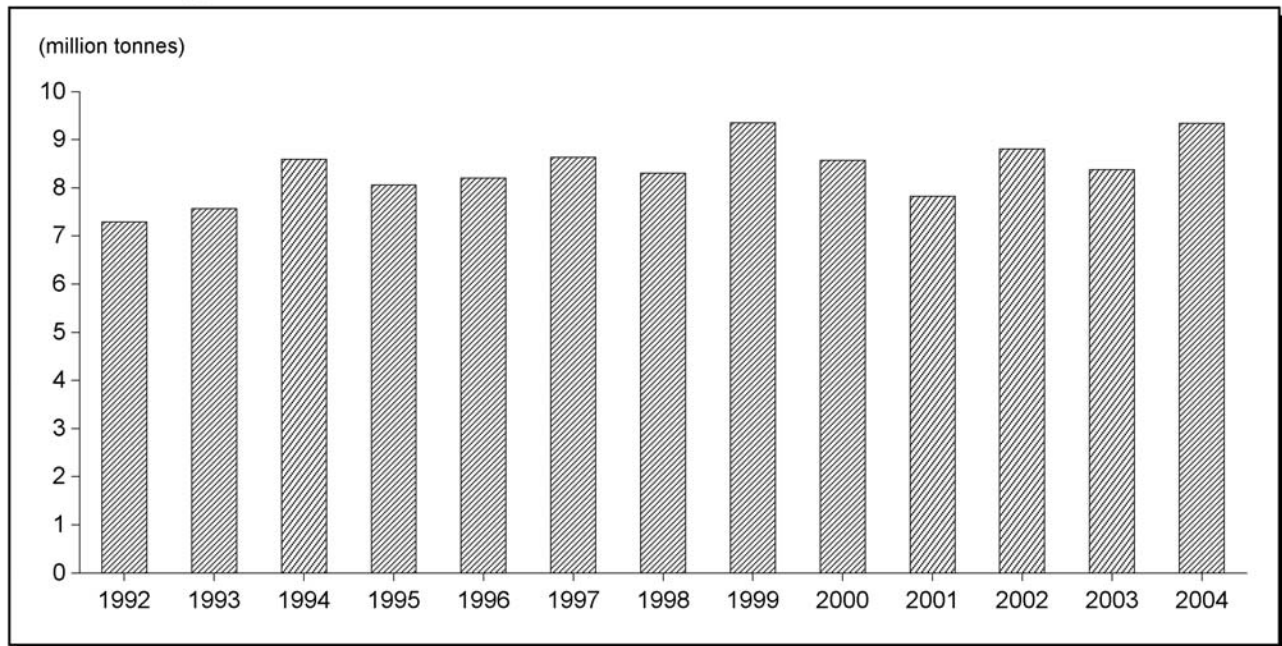
In addition to natural gypsum production, two electric power utilities produce synthetic (FGD, or flue gas desulphurization) gypsum via the wet limestone SO_2 scrubber process. Ontario Power Generation Inc. produces by-product gypsum at its Lambton Generating Station south of Sarnia, Ontario, and sells the product to the BPB Canada Inc. wallboard plant near Toronto, Ontario. NB Power produces synthetic gypsum at its Belledune Generating Station near Bathurst, New Brunswick, and ships to the CGC Inc. wallboard plant in Montréal, Quebec. In Canada, all of the by-product gypsum produced is used in the cement and wallboard industries, as shown in Table 4.

Figure 1
Gypsum Producers in Canada, 2004



1. Galen Gypsum Mines Limited, Coal Brook, N.L.
2. Fundy Gypsum Company, Wentworth and Miller Creek, N.S.
3. Georgia-Pacific Canada, Inc., Melford, N.S.
4. Little Narrows Gypsum Company, Little Narrows, N.S.
5. National Gypsum (Canada) Ltd., Milford Station, N.S.
6. CGC Inc., Hagersville, Ont.
7. Georgia-Pacific Canada, Inc., Caledonia, Ont.
8. BPB Canada Inc., Amaranth, Man.
9. Georgia-Pacific Canada, Inc., Canal Flats, B.C.
10. BPB Canada Inc., Windermere, B.C.

Figure 2
Canadian Gypsum Production, 1992-2004



Source: Natural Resources Canada.

Nova Scotia accounts for about 84% of Canada's production of natural gypsum and for nearly all of its exports. The gypsum mines in Nova Scotia are open-pit mines that provide high-quality, low-cost raw material. The majority of Nova Scotia production is shipped by ocean freighter to wallboard plants along the U.S. eastern seaboard.

USE

The main uses for calcined gypsum are wallboard (also known as drywall or plasterboard) and for art and dental plasters. Uncalcined gypsum (up to 5% by weight) is used as a set retarder in the manufacture of portland cement and as a soil conditioner and fertilizer additive in agricultural applications. The use of natural and synthetic gypsum in wallboard is largely driven by residential and commercial construction activity in Canada and the United States.

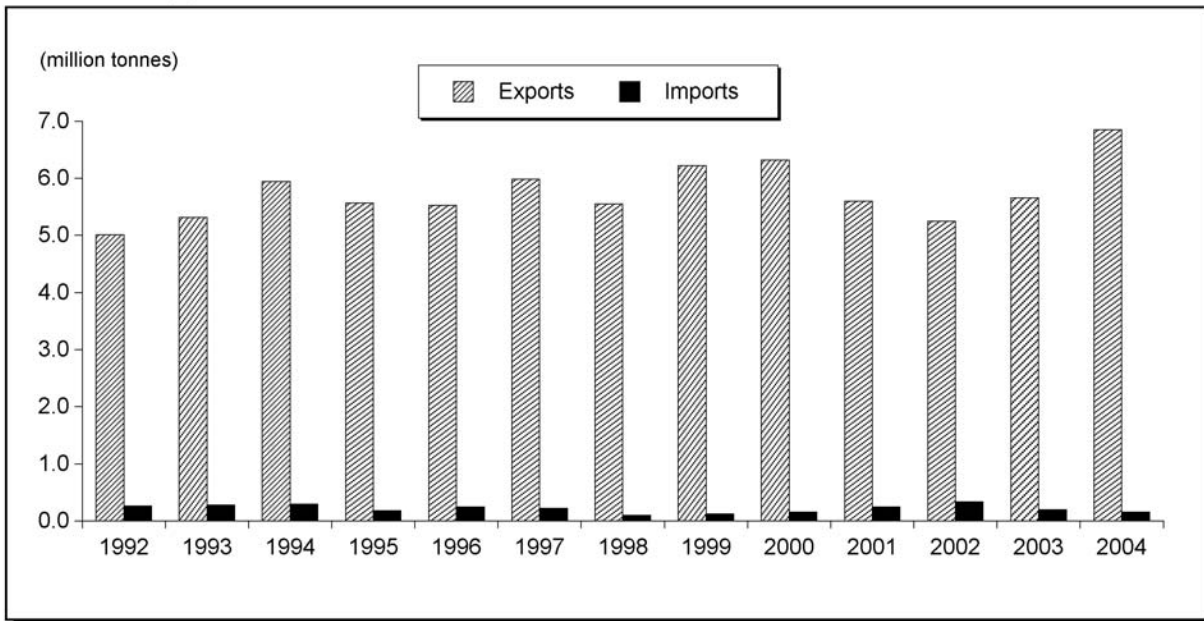
In North America, wallboard manufacturing accounts for an estimated 75% of gypsum use, cement processing accounts for 10-15%, and agriculture and industrial processes account for the remainder of uses. Waste wallboard derived from the construction and demolition industry continues to be recycled into new wallboard. It is estimated that 910 kg of waste wallboard is generated for each new home (185 m² or 2000 sq. ft.). New West Gypsum

Recycling Inc. operates wallboard recycling plants in New Westminster, British Columbia, and Oakville, Ontario. Since 1985, the company has recycled 1.7 Mt of waste wallboard. The waste product can be re-used at a rate of 25% waste to 75% natural gypsum without affecting the quality or specifications.

TRADE

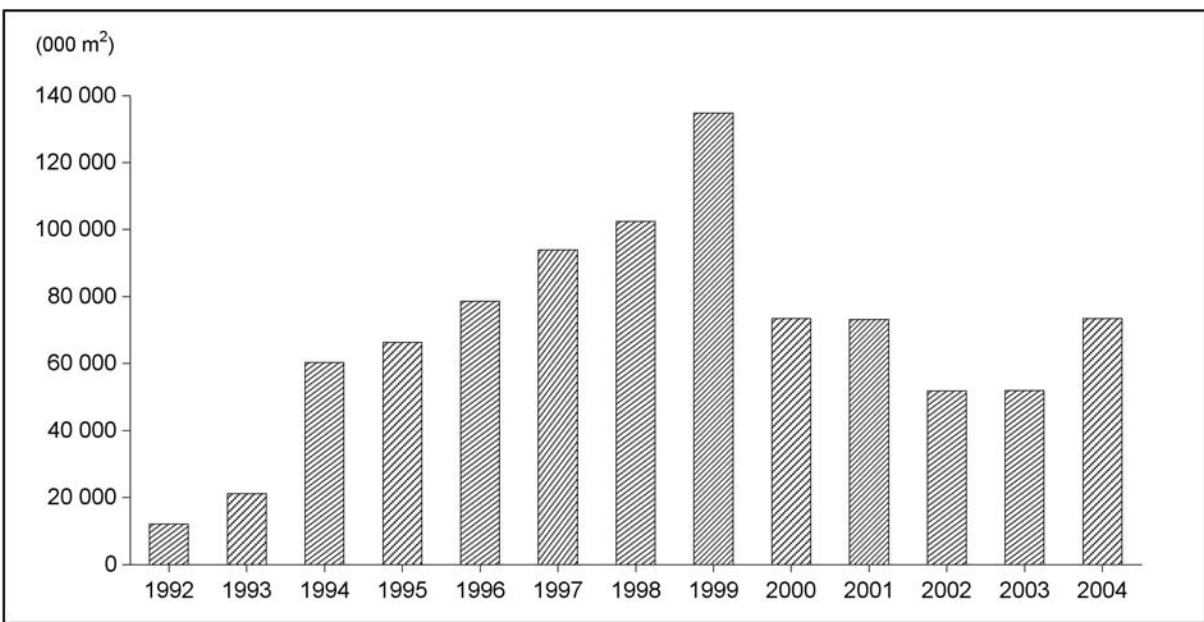
Canadian mines exported 6.85 Mt of raw gypsum to the United States in 2004, compared with 5.65 Mt in 2003, representing a substantial 21% increase. The trend in Canadian gypsum exports for the period 1992-2004 can be seen in Figure 3. There has been a steady increase in exports since 2001. Canadian wallboard manufacturers exported 73.27 million m² of wallboard to the United States in 2004, up 42% from the previous year (Table 1). Wallboard exports for the period 1992-2004 are shown in Figure 4. Following a strong upward trend between 1992 and 1999, exports have been in the 70 million m² range. Imports of both raw gypsum and wallboard from the United States are small in relation to exports (Figure 3 and Table 1). The apparent use of gypsum in Canada decreased 9.7% in 2004, as shown in Table 3.

Figure 3
Canadian Gypsum Trade, 1992-2004



Source: Natural Resources Canada.

Figure 4
Gypsum Wallboard Exports, 1992-2004



Source: Natural Resources Canada.

WORLD OVERVIEW

World production of gypsum in 2004 was an estimated 106 Mt (Table 5, from U.S. Geological Survey data). The United States ranked number one with production of 18.0 Mt, followed by Iran, 11.5 Mt; Canada, 9.3 Mt; Spain, 7.5 Mt; and China, 6.9 Mt. Figure 5 shows world gypsum production for 2003 and 2004. The majority of producing countries maintained their level of production in 2004 with significant increases noted in Canada and the United States. According to the Gypsum Association, U.S. wallboard plants shipped a record 34.24 billion sq. ft. of wallboard products in 2004, an 8% increase over 2003. The United States sourced 66% of its imported gypsum from Canada in 2004.

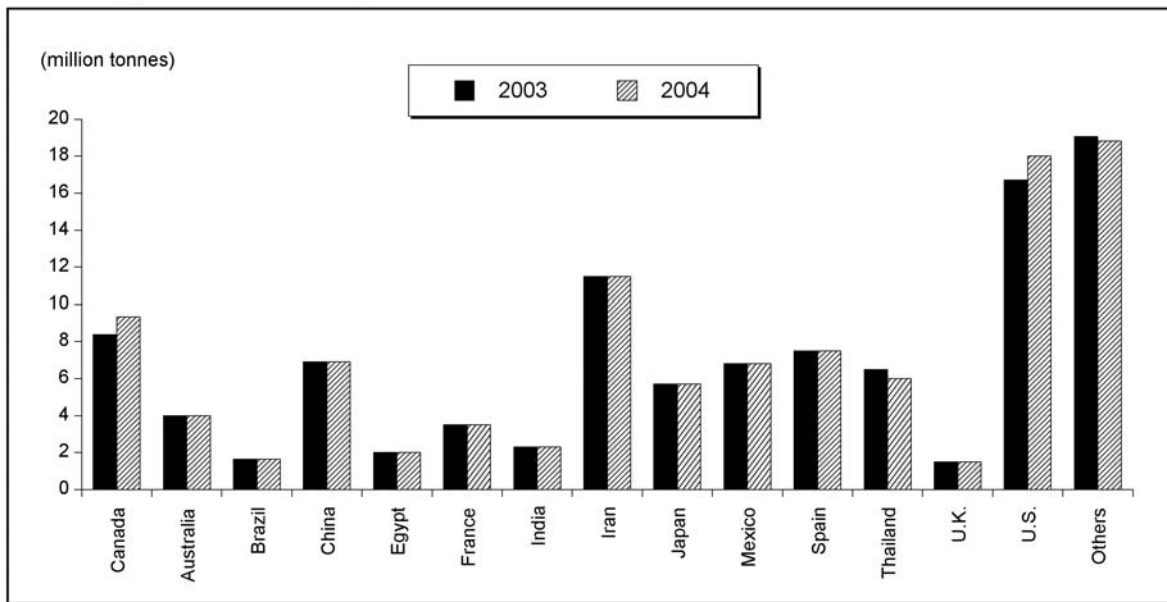
In December 2003, the U.S. Environmental Protection Agency signed the Clean Air Interstate Rule (originally called the Interstate Air Quality Rule), which will regulate the amounts of sulphur dioxide and nitrogen oxides that power plants and other industrial facilities will be allowed to emit by 2015 when the rule will be fully implemented. Emissions of SO₂ will be reduced by as much as 70% in some states by 2015. Individual states will be required to meet statewide targets. This rule will force some electricity companies to install new FGD equipment. The outcome of further additions of FGD systems will be a steady increase in the amount of synthetic gypsum available to wallboard manufacturers. Synthetic gypsum is of very high quality, is a locally derived resource, and is cost-competitive in relation to mined gypsum ore.

National Gypsum Co., based in Charlotte, North Carolina, announced plans to build a high-speed wallboard plant in the Charlotte area. The new facility will use synthetic gypsum supplied by Duke Power from its Marshall Steam Station and will have a capacity of 1 billion sq. ft. BPB America Inc. announced plans for a new US\$100 million, 700 million-sq.-ft. capacity wallboard plant in Roxboro, North Carolina, that will be commissioned in 2008. Synthetic gypsum will be supplied under an agreement with Progress Energy from nearby power plants. In November 2004, Lafarge North America revealed plans to modernize its Buchanan, New York, wallboard plant by investing US\$75 million. Its capacity will be doubled to 650 million sq. ft.

U.S. Gypsum Co. shipped 11 billion sq. ft. (bsf) of wallboard in 2004, a 6% increase compared to the previous year, and its wallboard plants operated at 94% of capacity. BPB Inc. reported worldwide sales of 12.1 bsf of wallboard in 2004, up from 9.1 bsf the previous year. Sales in North America were 5.4 bsf, an 11% increase over the previous year.

According to the American Coal Ash Association, synthetic gypsum production in the United States in 2003 was 11.9 Mt from 18 coal-fired power plants. Synthetic gypsum is also produced at sulphate-route titanium dioxide plants in Canada at Varennes, Quebec, and in the United States. In 2003, 70% of all synthetic gypsum produced in the United States was used primarily in wallboard production and in the cement manufacturing sector.

Figure 5
World Gypsum Production, 2003 and 2004



Source: U.S. Geological Survey.

PRICES

Prices for gypsum in the merchant market are negotiated between supplier and user and are not generally published. From Table 1, the value of gypsum production is equivalent to C\$12.20/t. According to the U.S. Geological Survey, crude gypsum f.o.b. mine averaged US\$6.90 per short ton (st) in 2004 while calcined gypsum averaged US\$20/st. The reported average price for wallboard in 2003 was US\$210 per 1000 sq. ft., which represented an overall increase of 4.9% for the year.

U.S. Gypsum, the largest manufacturer of gypsum products in the United States, reported that average selling prices for wallboard increased 21% in 2004. The nationwide average realized price for SHEETROCK^(R)-brand gypsum wallboard was US\$122.37 per 1000 sq. ft. in 2004, up 21% from US\$101.43 in 2003.

OUTLOOK

As a measure of construction growth potential, the key driver of the gypsum wallboard industry, housing starts increased by 6.8% overall in 2004 to 233 400 units, compared to 218 400 units in 2003 (Statistics Canada). Increases were noted in Quebec (16.3%) and British Columbia (6.8%), while there was no change in starts for Ontario or Alberta. Canada Mortgage and Housing Corporation expects housing starts in 2005 to be about 9% lower (to around 210 200 units) due to a general cooling off of the housing market across the country.

Canadian shipments of gypsum in 2005 are expected to improve slightly due to strong demand for wallboard in the United States. There are indications that non-residential construction may increase slightly in 2005, adding more demand for gypsum-based construction products.

The production of synthetic gypsum, mainly in the United States, is expected to continue to increase as electric utility companies add SO₂ scrubber systems to existing power plants. This will offset the use of natural gypsum in wallboard which, over the long term, may reduce exports of Canadian natural gypsum south of the border.

ANHYDRITE

Anhydrite (CaSO₄) is the anhydrous form of gypsum. It has a grey to blue-grey colour, has a hardness of about 3.5 (compared to gypsum at 2) and is denser than gypsum. It typically occurs below gypsum beds with the overlying gypsum having been formed by the weathering of a thicker anhydrite layer and is generally excluded from gypsum mining. Production and trade data for anhydrite

are included with gypsum (Table 1). Anhydrite is produced by Fundy Gypsum Company at Wentworth, Nova Scotia, and by Little Narrows Gypsum Company at Little Narrows, Nova Scotia.

Shipments of anhydrite, mainly to the United States, are used as a soil conditioner and fertilizer, and in portland cement manufacture. The mineral has also been used for roof support in underground mining applications where it sets up like cement and can be blown into mining cavities that need to be sealed.

Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 64. (2) Information in this review was current as of June 30, 2005. (3) This and other reviews, including previous editions, are available on the Internet at www.nrcan.gc.ca/mms/cmy/com_e.html.

NOTE TO READERS

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TARIFFS

Item No.	Description	Canada			United States	EU	Japan
		MFN	GPT	USA	Canada	Conventional Rate (1)	WTO (2)
2520.10	Gypsum; anhydrite	Free	Free	Free	Free	Free	Free
2520.20	Plasters	Free	Free	Free	Free	Free	Free - 2.5%
68.09	Articles of plaster or of compositions based on plaster; boards, sheets, panels, tiles and similar articles, not ornamented						
6809.11	Faced or reinforced with paper or paperboard only						
6809.11.10	Gypsum wallboard	6%	Free	Free	Free	1.7%	Free
6809.11.90	Other	6%	Free	Free	Free	1.7%	Free
6809.19.00	Other	6.5%	3%	Free	Free	1.7%	Free
6809.90	Other articles						
6809.90.10	Models and casts, of a kind used in the manufacture of dental prostheses	Free	Free	Free	Free	1.7%	Free
6809.90.90	Other	6.5%	3%	Free	Free	1.7%	Free

Sources: Canadian Customs Tariff, effective January 2005, Canada Border Services Agency; Harmonized Tariff Schedule of the United States, 2005; Official Journal of the European Union (October 30, 2004 Edition); Customs Tariff Schedules of Japan, 2004.

(1) The customs duties applicable to imported goods originating in countries that are Contracting Parties to the General Agreement on Tariffs and Trade or with which the European Community has concluded agreements containing the most-favoured-nation tariff clause shall be the conventional duties shown in column 3 of the Schedule of Duties. (2) WTO rate is shown; lower tariff rates may apply circumstantially.

TABLE 1. CANADA, GYPSUM PRODUCTION AND TRADE, 2002-04

	2002		2003		2004 (p)	
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
PRODUCTION (Shipments)						
Crude gypsum						
Newfoundland and Labrador	-	-	x	x	x	x
Nova Scotia	7 341 583	84 477	6 799 456	83 187	7 866 110	93 473
Ontario	x	x	x	x	x	x
Manitoba	x	x	x	x	x	x
British Columbia	x	x	x	x	x	x
Total (1)	8 809 102	105 234	8 378 326	108 461	9 339 068	113 936
EXPORTS						
2520.10	Gypsum, anhydrite					
United States	5 244 145	68 184	5 651 752	70 306	6 844 264	87 038
Algeria	-	-	-	-	5 796	261
United Kingdom	-	-	320	20	966	76
Israel	66	4	68	4	629	38
France	11	1	99	5	521	28
Australia	-	-	588	66	490	27
Cuba	-	-	-	-	577	27
Germany	-	-	-	-	477	23
Singapore	-	-	69	6	301	18
Taiwan	-	-	-	-	339	17
Hong Kong	144	10	24	2	197	10
Malaysia	-	-	31	2	205	10
Mexico	-	-	-	-	133	8
Other countries	1 294	99	1 389	232	388	23
Total	5 245 660	68 298	5 654 340	70 643	6 855 283	87 604
2520.20	Gypsum; anhydrite; plasters					
United States	4 488	2 530	1 693	951	1 263	713
Ireland	125	70	306	171	654	316
Cuba	4	3	115	101	130	82
Latvia	-	-	79	45	127	68
Greece	-	-	133	86	71	60
Bermuda	-	-	37	19	104	50
Other countries	130	107	156	112	198	103
Total	4 747	2 710	2 519	1 485	2 547	1 418

TABLE 1 (cont'd)

Item No.	2002		2003		2004 (p)		
	(m ²)	(\$000)	(m ²)	(\$000)	(m ²)	(\$000)	
EXPORTS (cont'd)							
6809.11	Plasterboards, etc., not ornamental; faced or reinforced with paper or paperboard						
	United States	51 542 296	61 384	51 612 649	55 385	73 279 149	71 986
	Cuba	6 767	26	134 158	150	67 789	286
	Russia	—	—	27 450	40	9 029	56
	Saint Pierre and Miquelon	8 848	22	4 420	17	14 967	47
	Cayman Islands	—	—	—	—	12 409	36
	Japan	—	—	1 590	6	8 636	31
	Bermuda	7 600	19	46 977	80	9 928	30
	Aruba	—	—	—	—	8 295	28
	Dominican Republic	19 587	21	—	—	3 564	25
	Jamaica	—	—	7 309	31	6 628	21
	France	21 795	52	2 336	7	4 619	12
	Croatia	—	—	665	3	2 386	7
	Kenya	—	—	—	—	1 319	5
	Portugal	—	—	17 118	132	1 506	4
	Other countries	160 108	393	37 027	140	3 698	12
	Total	51 767 001	61 917	51 891 699	55 991	73 433 922	72 586
		(n.a.)	(\$000)	(n.a.)	(\$000)	(n.a.)	(\$000)
6809.19	Plasterboards, etc., not ornamental; faced or reinforced, n.e.s.						
	United States	n.a.	27 689	n.a.	9 956	n.a.	6 556
	United Arab Emirates	n.a.	135	n.a.	91	n.a.	122
	Other countries	n.a.	336	n.a.	326	n.a.	190
	Total	n.a.	28 160	n.a.	10 373	n.a.	6 868
6809.90	Articles of plaster or compositions based on plaster						
	United States	n.a.	37 955	n.a.	32 709	n.a.	31 998
	Austria	—	—	—	—	n.a.	1 335
	Other countries	n.a.	1 307	n.a.	2 477	n.a.	1395
	Total	n.a.	39 262	n.a.	35 186	n.a.	34 728
	Total exports	n.a.	200 347	n.a.	173 678	n.a.	203 204
		(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
IMPORTS							
2520.10	Gypsum, anhydrite						
	United States	257 443	14 013	130 940	13 079	125 903	13 084
	Mexico	75 015	1 078	65 233	1 049	26 390	1 296
	Other countries	50	32	39	30	62	21
	Total	332 508	15 123	196 212	14 158	152 355	14 401
2520.20	Gypsum; anhydrite; plasters						
	United States	60 039	14 610	51 695	11 962	62 214	10 715
	Italy	226	100	304	157	570	239
	Germany	78	77	47	34	150	49
	Malaysia	—	—	11	8	51	38
	China	42	2	85	18	346	28
	Other countries	220	94	326	192	467	53
	Total	60 605	14 883	52 468	12 371	63 798	11 122
		(n.a.)	(\$000)	(n.a.)	(\$000)	(n.a.)	(\$000)
6809.11	Plasterboards, etc., not ornamental; faced or reinforced with paper or paperboard						
	United States	n.a.	31 382	n.a.	37 281	n.a.	41 909
	Other countries	n.a.	158	n.a.	22	n.a.	16
	Total	n.a.	31 540	n.a.	37 303	n.a.	41 925

TABLE 1 (cont'd)

Item No.		2002		2003		2004 (p)	
		(n.a.)	(\$000)	(n.a.)	(\$000)	(n.a.)	(\$000)
IMPORTS (cont'd)							
6809.19	Plasterboards, etc., not ornamental; faced or reinforced, n.e.s.						
	United States	n.a.	15 277	n.a.	16 428	n.a.	18 251
	Other countries	n.a.	585	n.a.	179	n.a.	17
	Total	n.a.	15 862	n.a.	16 607	n.a.	18 268
6809.90	Articles of plaster or compositions based on plaster						
	United States	n.a.	2 855	n.a.	2 829	n.a.	2 024
	China	n.a.	540	n.a.	141	n.a.	807
	Mexico	n.a.	935	n.a.	371	n.a.	515
	Thailand	n.a.	364	n.a.	379	n.a.	324
	United Kingdom	n.a.	2 035	n.a.	790	n.a.	250
	Other countries	n.a.	243	n.a.	192	n.a.	289
	Total	n.a.	6 972	n.a.	4 702	n.a.	4 209
	Total imports	n.a.	84 380	n.a.	85 141	n.a.	89 925

Sources: Natural Resources Canada; Statistics Canada.

– Nil; n.a. Not applicable; (p) Preliminary; x Confidential.

(1) Totals do not include gypsum produced or shipped for use by Canadian portland cement producers.

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

TABLE 2. CANADA, GYPSUM MINES AND GYPSUM PRODUCTS MANUFACTURING OPERATIONS, 2004

Company	Location	Operation
NEWFOUNDLAND AND LABRADOR		
Galen Gypsum Mines Limited	Coal Brook	Open-pit mining
Lafarge Gypsum Canada Inc.	Corner Brook	Wallboard manufacture
NOVA SCOTIA		
Fundy Gypsum Company	Wentworth and Miller Creek	Open-pit mining of gypsum and anhydrite
Georgia-Pacific Canada, Inc.	Melford	Open-pit mining
Little Narrows Gypsum Company	Little Narrows	Open-pit mining of gypsum and anhydrite
National Gypsum (Canada) Ltd.	Milford Station	Open-pit mining
NEW BRUNSWICK		
BPB Canada Inc.	McAdam	Wallboard manufacture
QUEBEC		
CGC Inc.	Montréal	Wallboard manufacture
Georgia-Pacific Canada, Inc.	Montréal	Distribution terminal only
BPB Canada Inc.	Montréal	Wallboard manufacture
ONTARIO		
CGC Inc.	Hagersville	Underground mining and wallboard manufacture
Georgia-Pacific Canada, Inc.	Caledonia	Wallboard manufacture (mine closed May 2004)
BPB Canada Inc.	Mississauga	Wallboard manufacture
MANITOBA		
BPB Canada Inc.	Amaranth Winnipeg	Open-pit mining Wallboard manufacture
ALBERTA		
Georgia-Pacific Canada, Inc.	Edmonton	Wallboard manufacture
BPB Canada Inc.	Calgary	Wallboard manufacture
BRITISH COLUMBIA		
Georgia-Pacific Canada, Inc.	Canal Flats Vancouver	Open-pit mining Gypsum products manufacture
BPB Canada Inc.	Vancouver Windermere	Gypsum products manufacture Open-pit mining

Source: Natural Resources Canada.

TABLE 3. CANADA, GYPSUM PRODUCTION, TRADE AND USE, 1988-2004

	Production (1)	Imports (2)	Exports	Apparent Use (3)
	(tonnes)			
1988 (a)	8 813 760	274 917	5 651 286	3 437 391
1989	8 179 588	291 374	5 357 055	3 113 907
1990	7 977 685	318 114	5 757 327	2 538 472
1991	6 727 221	259 863	4 940 193	2 046 891
1992	7 294 700	260 505	5 010 649	2 544 556
1993	7 563 369	280 581	5 315 618	2 528 332
1994	8 587 303	292 156	5 942 572	2 936 887
1995	8 054 741	177 326	5 565 427	2 666 640
1996	8 201 774	247 207	5 526 010	2 922 971
1997	8 627 772	220 915	5 981 974	2 866 713
1998	8 306 534	96 591	5 552 146	2 850 979
1999	9 345 342	121 049	6 224 829	3 241 562
2000	8 572 464	154 604	6 318 686	2 408 382
2001	7 821 013	243 143	5 596 557	2 467 599
2002	8 809 102	332 509	5 245 662	3 895 949
2003	8 378 326	196 212	5 654 341	2 920 197
2004 (p)	9 339 068	152 355	6 855 283	2 636 140

Sources: Natural Resources Canada; Statistics Canada.

(p) Preliminary.

(a) Beginning in 1988, imports and exports are based on the new Harmonized System and may not be in complete accordance with previous method of reporting. Imports and exports include H.S. class 2520.10.00 (gypsum, anhydrite).

(1) Producers' shipments of crude gypsum. (2) Includes crude and ground, but not calcined.

(3) Production plus imports minus exports.

TABLE 4. CANADA, PRODUCTION AND USE OF COAL COMBUSTION PRODUCTS (CCPs), 2004 (1,2)

	Fly Ash	Bottom Ash	FGD Gypsum	Other (3)	Total CCPs
	(000 tonnes)				
PRODUCTION					
Produced	4 679	1 582	x	x	6 785
Disposed/stored	3 655	x	–	x	5 034
Removed from disposal	x	95	–	–	x
USE (DOMESTIC)					
Cement	625	x	x	–	922
Concrete/grout	593	–	–	–	593
Mining applications	x	–	–	–	x
Roadbase/subbase	x	x	–	–	215
Wallboard	–	–	x	–	x
Other (4)	x	x	x	–	233
Total use	1 431	x	x	–	2 264
Individual use percentage	31	30	102	–	33

Sources: Compiled by Natural Resources Canada in cooperation with the Canadian Electricity Association and the Association of Canadian Industries Recycling Coal Ash (CIRCA).
– Nil; FGD Flue-gas desulphurization; x Confidential.

(1) Reported production of CCPs may include both dry and ponded categories. (2) Use (domestic), as reported, includes amounts imported (assumed H.S. codes 2621.00 relating to fly ash and H.S. 2520.10 relating to gypsum). (3) Cfb (circulating fluidized bed) fly ash and bottom ash. (4) Includes waste stabilization and specialty uses such as mineral filler and flowable fill.

TABLE 5. WORLD PRODUCTION OF GYPSUM, 2002-04

	2002	2003	2004 (e)
	(000 tonnes)		
Canada	8 809	8 378	9 340
Australia	4 000	4 000	4 000
Austria	1 000	1 000	1 000
Brazil	1 510	1 650	1 650
China	6 850	6 900	6 900
Egypt	2 000	2 000	2 000
France	3 500	3 500	3 500
India	2 300	2 300	2 300
Iran	11 500	11 500	11 500
Japan	5 900	5 700	5 700
Mexico	6 500	6 800	6 800
Poland	1 100	1 100	1 100
Russia	..	1 000	2 000
Spain	7 500	7 500	7 500
Thailand	6 330	6 500	6 500
United Kingdom	1 500	1 500	1 500
United States	15 700	16 700	18 000
Uruguay	1 130	1 130	1 130
Other countries	13 871	12 452	13 580
Total world	101 000	102 000	106 000

Sources: Natural Resources Canada; U.S. Geological Survey.

.. Not available; (e) Estimated.