

# Gypsum and Anhydrite

---

## **Oliver Vagt**

The author is with the Minerals and Metals Sector,  
Natural Resources Canada.  
Telephone: (613) 992-2667  
E-mail: ovagt@nrcan.gc.ca

## **GYP SUM**

Canadian shipments of natural gypsum totaled 8.5 Mt valued at \$95.9 million in 2000, based on preliminary data (Table 1). This amount compares to 9.3 Mt valued at \$106.6 million in 1999, based on final data. The reported 8.5% decrease in shipments resulted mainly from a decrease in demand for finished products in both the United States and Canada, according to preliminary data from Statistics Canada and to the Gypsum Association. In addition to shipments of natural gypsum, domestic shipments of commercial-quality, flue-gas derived (FGD) gypsum from coal-fired generating stations are estimated to be about 400 000 t/y, with total use estimated to be 550 000 t/y.

## **Canadian Industry**

Most gypsum producers in Canada are closely integrated in both mining and wallboard manufacturing. Six companies operate eleven mines and a total of fourteen wallboard plants accounting for an estimated 2000 employees. The major gypsum mining and related production plants are listed in Table 2.

In Atlantic Canada, Nova Scotia accounts for nearly 80% of Canada's output of natural gypsum and nearly all of its exports. Most gypsum deposits being mined in the Atlantic provinces are characterized by their high quality, amenability to inexpensive mining methods, and close access to coastal bulk-shipping facilities.

In Newfoundland, Lafarge Canada Inc. completed a modernization program at its wallboard manufacturing plant that it purchased in 1999 from affiliates of Atlantic Group Limited.

Georgia-Pacific Canada Inc., operating in Nova Scotia, received approval to develop new reserves of gypsum near Melford in Cape Breton to eventually replace its current operation in this region.

In New Brunswick, Plaster Rock Gypsum and Manufacturing Company, located in Plaster Rock, began crushing gypsum with a view to supplying agricultural markets in 2001.

In Quebec, most demand for gypsum is satisfied by shipments of raw material, including synthetic gypsum from Atlantic Canada.

In Ontario and western Canada, developments remained essentially the same. (Refer to the "Gypsum and Anhydrite" chapter of the 1998 *Canadian Minerals Yearbook*.)

## **World Developments and Trade**

World reserves of gypsum are widespread; North American reserves are estimated to be more than 1.1 billion t. World production of gypsum in 2000 was an estimated 110 Mt, based mainly on estimates by the U.S. Geological Survey (refer to the Office of Minerals Information's web site at <http://www.usgs.gov>). The United States ranked number one with production of 25 Mt, followed by Iran, 9.7 Mt; China, 9.0 Mt; and Canada, 8.5 Mt. Shipments of wallboard by U.S. producers were 2.6 billion m<sup>2</sup>, based on estimates made in late 2000 by the Washington, D.C.-based Gypsum Association (GA). (This amount represents more than a 3% decrease in shipments compared to the previous 12-month period.)

Canada's imports of gypsum from the United States and Mexico (Table 1) are used by both wallboard and cement manufacturers. Imports from Spain, however, are reportedly for use only by specific cement manufacturers.

In the United States, the construction of several major new plants and expansions designed to use only synthetic gypsum continued during 2000.

## Processing and Markets

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. In general, the wallboard industry serves the residential, institutional and commercial building sectors. In the United States, more than 6 Mt/y of synthetic gypsum is reported as being sold or used as a complete or partial substitute for natural gypsum, according to the U.S. Geological Survey. U.S. shipments of wallboard in 2000 were at near-full capacity, amounting to more than 2.9 billion m<sup>2</sup> (31.6 billion square feet), a record for the industry according to the GA (Canadian wallboard plants produced about 281 million m<sup>2</sup> [3.0 billion square feet], also according to the GA).

The Portland cement industry requires crushed, non-calcined gypsum, acting as a set regulator in a proportion up to 5% by total weight, ground with the primary stage cement clinker, to produce the final cement product. Based on this proportion of gypsum, the total amount required by cement producers in Canada is estimated to be 400 000-450 000 t/y.

Other uses for gypsum relate mainly to agriculture as a soil conditioner, as a mineral filler in joint compounds, plastics and paints, and in certain glass-making technologies.

Process Research ORTECH Inc. sponsored Gypsum 2000 – Sixth International Conference on Natural and Synthetic Gypsum, held in Toronto in May. This series of conferences has contributed greatly to improving communication and the dissemination of new information among power utilities and other synthetic gypsum producers, users, and equipment suppliers. It is expected that the seventh conference will be held again in Toronto in 2002.

## Prices

Prices for gypsum in merchant markets are negotiated among buyers and sellers, and published figures are not always relevant. In Canada, the average reported value for crude gypsum, f.o.b. mine, is about \$11.10/t for the five-year period from 1996 to 2000.

## Outlook

Canadian shipments of gypsum in 2001 are expected to be moderately weaker based on projected weaker exports serving residential and non-residential construction markets in the United States. In Canada, housing starts were 137 000 in 1998, 150 000 in 1999, and about 152 000 in 2000; starts in 2001 are forecast to be about 155 000, according to the Canada Mortgage and Housing Corporation. Domestic demand for gypsum remains positive, based on continuing overall economic growth and an increase in

the value of building permits in early 2001. Also, the outlook continues to be positive in the commercial and institutional building sectors, and commercial vacancy rates are relatively low in several urban areas in Canada. This suggests that additional real estate space will be needed in the near future.

Diverse uses of gypsum related to building plasters, Portland cement, fillers and pigments, soil conditioners, and fertilizers as a diluent are important and tend to expand with overall economic growth. The present structure of the industry in Canada is not expected to change significantly, although the future availability of low-cost synthetic gypsum resulting from more strenuous emission controls may serve to increase demand for this mineral.

## ANHYDRITE

Production and trade statistics for anhydrite are included with gypsum. Anhydrite, the anhydrous form of gypsum (about twice as hard and also denser than gypsum), is produced by Fundy Gypsum Company at Wentworth, Nova Scotia, and by Little Narrows Gypsum Company at Little Narrows, Nova Scotia.

Shipments of anhydrite in 1999 were 163 300 t, mainly to the United States for use as a peanut crop fertilizer, and to Quebec and Ontario for final-stage processing of Portland cement. Similarly, shipments in 2000 were an estimated 191 000 t, according to the Nova Scotia Department of Natural Resources.

Test work on the use of anhydrite in floor screed and suspended floor systems, comprising part of an earlier Canada-Nova Scotia cooperative mineral development project, showed promise as new uses for Canadian gypsum. Similarly, testing of anhydrite (in combination with water and special chemicals) as a mine "pack" construction material to improve underground support in coal mines has been encouraging.

*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 January 30, 2001. (3) This and other reviews, including previous editions, are available on the Internet at [http://www.nrcan.gc.ca/mms/cmty/index\\_e.html](http://www.nrcan.gc.ca/mms/cmty/index_e.html).*

## NOTE TO READERS

The intent of this document is to provide general information and to elicit discussion. It is not included as a reference, guide or suggestion to be used in trading, investment or other commercial activities. The author and Natural Resources make no warranty of any kind with respect to the content and accept no liability, either incidental, consequential, financial or otherwise, arising from the use of this document.

**TARIFFS**

Item No.	Description	Canada			United States
		MFN	GPT	USA	Canada
2520.10	Gypsum; anhydrite	Free	Free	Free	Free
2520.20	Plasters	Free	Free	Free	Free
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
6809.11.90	Other	6%	Free	Free	Free
6809.19.00	Other	6.5%	3%	Free	Free
6809.90	Other articles				
6809.90.10	Models and casts, of a kind used in the manufacture of dental prosthesis	Free	Free	Free	Free
6809.90.90	Other	6.5%	3%	Free	Free

Sources: *Customs Tariff*, effective January 2001, Canada Customs and Revenue Agency; *Harmonized Tariff Schedule of the United States*, 2001.

**TABLE 1. CANADA, GYPSUM PRODUCTION AND TRADE, 1998-2000**

Item No.	1998		1999		2000p	
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
<b>PRODUCTION</b> (shipments)						
Crude gypsum						
	x	x	x	x	x	x
Newfoundland						
Nova Scotia	6 545	537	7 483	604	83 637	6 876 446
Ontario	x	x	x	x	x	x
Manitoba	x	x	x	x	x	x
British Columbia	x	x	x	x	x	x
Total <sup>1</sup>	8 306	534	9 345	342	106 634	8 548 139
<b>IMPORTS</b>						
2520.10	Gypsum, anhydrite					
	82 405	5 269	83 336	9 220	78 864	10 239
United States	14 084	1 681	37 514	2 353	75 673	1 763
Mexico	-	-	83	122	30	16
United Kingdom	-	-	89	127	-	-
Brazil	104	39	26	21	19	26
Other countries	96 593	6 989	121 048	11 843	154 586	12 044
Total						
2520.20	Gypsum; anhydrite; plasters					
	38 216 <sup>r</sup>	12 343 <sup>r</sup>	28 609	9 619	36 199	11 205
United States	60	43	73	64	122	106
Japan	91 <sup>r</sup>	68 <sup>r</sup>	77	45	132	82
Italy	8	9	31	24	51	46
Germany	7	2	30	8	113	21
Mexico	126	70	126	73	98	47
Other countries	38 508 <sup>r</sup>	12 535 <sup>r</sup>	28 946	9 833	36 715	11 507
Total						
	(square metres)		(square metres)		(square metres)	
6809.11	Plasterboards, etc., not ornamental; faced or reinforced with paper or paperboard					
	..	3 039	..	5 152	..	7 487
United States	..	108	..	1 988	..	35
United Kingdom	-	-	..	1 897	..	1
Germany	-	-	..	1 931	-	-
Poland	..	4	..	10	..	60
Other countries	..		..		..	
Total	..	3 151	..	10 978	..	7 583
6809.19	Plasterboards, etc., not ornamental; faced or reinforced, n.e.s.					
	..	6 622	..	9 469	..	10 788
United States	..	77	..	33	..	50
Other countries	..		..		..	
Total	..	6 699	..	9 502	..	10 838
6809.90	Articles of plaster or compositions based on plaster					
	..	4 252	..	4 293	..	3 522
United States	..	814	..	557	..	1 531
Mexico	..	683	..	448	..	558
China	..	672	..	601	..	507
United Kingdom	..	68 <sup>r</sup>	..	21	..	72
Thailand	..	118	..	7	..	5
Germany	..	143	..	140	..	120
Other countries	..	6 750 <sup>r</sup>	..	6 067	..	6 315
Total	..		..		..	
Total imports of gypsum and gypsum products						
	..	36 124 <sup>r</sup>	..	48 223	..	48 287

TABLE 1 (cont'd)

Item No.	1998		1999		2000 <sup>p</sup>		
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)	
<b>EXPORTS</b>							
2520.10	Gypsum, anhydrite						
	United States	5 530 117	70 726	6 224 766	88 343	6 321 232	97 427
	Japan	—	—	—	—	171	11
	Denmark	22 029	477	—	—	—	—
	Other countries	...	...	64	18	64	3
	Total	5 552 146	71 203	6 224 830	88 361	6 321 467	97 441
2520.20	Gypsum; anhydrite; plasters						
	United States	1 444	1 184	1 791	946	765	651
	France	23	11	—	—	99	73
	Bermuda	40	27	21	14	74	45
	Other countries	23	21	23	13	69	39
	Total	1 530	1 243	1 835	973	1 007	808
6809.11	Plasterboards, etc., not ornamental; faced or reinforced with paper or paperboard	(square metres)		(square metres)		(square metres)	
	United States	102 086 319	225 314	134 337 396	300 984	73 254 228	129 152
	Trinidad and Tobago	29 405	85	10 600	33	32 658	81
	Saudi Arabia	—	—	—	—	26 155	65
	Hong Kong	—	—	—	—	26 042	50
	Portugal	10 600	27	10 400	26	19 000	48
	Hungary	—	—	—	—	12 122	47
	China	—	—	7 900	20	17 200	43
	Germany	—	—	11 400	28	14 900	37
	Cuba	48 100	121	150 092	353	12 680	32
	Bermuda	40 230	107	3 109	12	10 300	26
	Croatia	—	—	12 400	31	5 400	14
	India	—	—	—	—	4 950	12
	Latvia	—	—	—	—	4 672	8
	Saint Pierre and Miquelon	3 600	9	14 352	24	8 767	6
	Chile	17 500	44	10 600	27	513	4
	Barbados	73 501	118	43 700	110	—	—
	Netherlands Antilles	3 982	10	42 160	106	—	—
	Venezuela	—	—	42 100	106	—	—
	Saint Kitts and Nevis	—	—	33 200	84	—	—
	Australia	—	—	24 300	67	—	—
	Saint Lucia	—	—	12 200	31	—	—
	United Kingdom	—	—	11 664	29	—	—
	Japan	—	—	11 100	28	—	—
	Czech Republic	—	—	9 600	24	—	—
	New Zealand	—	—	9 807	17	—	—
	South Korea	—	—	5 206	13	—	—
	Namibia	—	—	4 170	10	—	—
	Saint Vincent and the Grenadines	—	—	1 920	5	—	—
	Guyana	—	—	1 543	4	—	—
	France	43 332	130	—	—	—	—
	Israel	33 084	70	—	—	—	—
	Russia	18 809	42	—	—	—	—
	Total	102 408 462	226 077	134 820 919	302 172	73 449 587	129 625
6809.19	Plasterboards, etc., not ornamental; faced or reinforced, n.e.s.						
	United States	..	21 338	..	39 230	..	28 110
	Chile	..	57	..	168	..	269
	Cuba	..	—	..	—	..	119
	Italy	..	162	..	—	..	—
	Other countries	..	128	..	124	..	71
	Total	..	21 685	..	39 522	..	28 569
6809.90	Articles of plaster or compositions based on plaster						
	United States	..	20 190	..	29 572	..	29 759
	Finland	..	—	..	110	..	115
	United Kingdom	..	—	..	79	..	62
	United Arab Emirates	..	—	..	360	..	22
	Bahamas	..	443	..	432	..	—
	Israel	..	198	..	—	..	—
	China	..	126	..	—	..	—
	Other countries	..	386	..	239	..	136
	Total	..	21 343	..	30 792	..	30 094
	Total exports of gypsum and gypsum products	..	341 551	..	461 820	..	286 537

Sources: Natural Resources Canada; Statistics Canada.

— Nil; .. Not available or not applicable; ... Amount too small to be expressed; n.e.s. Not elsewhere specified; P Preliminary; r Revised; x Confidential.

<sup>1</sup> 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 MINING AND GYPSUM PRODUCTS MANUFACTURING OPERATIONS, 2000**

Company	Location	Operation
<b>NEWFOUNDLAND</b>		
Lafarge Gypsum Canada Inc.	Fischells Brook Corner Brook	Open-pit mining Wallboard manufacture
<b>NOVA SCOTIA</b>		
CGC Inc. Fundy Gypsum Company Georgia-Pacific Corporation Little Narrows Gypsum Company National Gypsum (Canada) Ltd.	Port Hawkesbury Wentworth and Miller Creek Sugar Camp Little Narrows Milford	Fibre-gypsum board manufacture Open-pit mining of gypsum and anhydrite Open-pit mining Open pit mining of gypsum and anhydrite Open-pit mining
<b>NEW BRUNSWICK</b>		
Westroc Inc.	McAdam	Wallboard manufacture
<b>QUEBEC</b>		
CGC Inc. Georgia-Pacific Corporation Westroc Inc.	Montréal Saint-Jérôme Montréal Montréal	Wallboard manufacture Wallboard plant mothballed Distribution terminal only Wallboard manufacture
<b>ONTARIO</b>		
CGC Inc. Georgia-Pacific Corporation Westroc Inc.	Hagersville Caledonia Clarkson	Underground mining and wallboard manufacture Underground mining and wallboard manufacture Wallboard manufacture
<b>MANITOBA</b>		
Georgia-Pacific Corporation Westroc Inc.	Amaranth Winnipeg Amaranth Winnipeg	Open-pit mining Wallboard manufacture Open-pit mining Wallboard manufacture
<b>ALBERTA</b>		
Georgia-Pacific Corporation Westroc Inc.	Edmonton Calgary	Wallboard manufacture Wallboard manufacture
<b>BRITISH COLUMBIA</b>		
Georgia-Pacific Corporation Westroc Inc.	Canal Flats Vancouver Vancouver Windermere	Open-pit mining Gypsum products manufacture Gypsum products manufacture Open-pit mining

Source: Natural Resources Canada.

**TABLE 3. CANADA, GYPSUM PRODUCED, TRADED AND USED, 1975, 1980 AND 1985-2000**

	Production <sup>1</sup>	Imports <sup>2</sup>	Exports	Apparent Use <sup>3</sup>
	(tonnes)			
1975	5 719 451	553 338	3 691 676	2 581 113
1980	7 336 000	154 717	4 960 240	2 530 477
1985	7 760 783	121 802	5 879 664	2 002 921
1986	8 802 805	221 644	5 921 982	3 102 467
1987	9 093 926	217 625	5 704 853	3 606 698
1988 <sup>a</sup>	8 813 760	274 917	5 651 286	3 437 391
1989	8 179 588	291 373	5 357 055	3 113 906
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	177 327	5 565 427	2 666 641
1996	8 201 774	247 208	5 526 010	2 922 972
1997	8 627 772	220 914	5 981 974	2 866 712
1998	8 306 534	96 593	5 552 146	2 850 981
1999	9 345 342	121 048	6 224 830	3 241 560
2000 <sup>p</sup>	8 548 139	154 586	6 321 467	2 381 258

Sources: Natural Resources Canada; Statistics Canada.

<sup>p</sup> Preliminary.<sup>a</sup> 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 HS class 2520.10.00 (gypsum, anhydrite).<sup>1</sup> Producers' shipments of crude gypsum. <sup>2</sup> Includes crude and ground, but not calcined. <sup>3</sup> Production plus imports minus exports.

**TABLE 4. CANADA, VALUE OF CONSTRUCTION BY TYPE, 1996-2000**

	1996	1997	1998	1999	2000
	(\$ millions)				
<b>BUILDING CONSTRUCTION</b>					
Residential investment	32.3	36.5	36.0	38.8	40.8
Non-residential building investment	19.6	22.5	22.4	24.2	25.3
Total building construction	51.9	59.0	58.4	63.0	66.1
<b>ENGINEERING CONSTRUCTION</b>					
Mining and oil and gas extraction	13.9	18.2	16.7	15.4	19.3
Transportation and warehousing	2.0	2.2	5.0	5.0	4.1
Other engineering	15.2	14.7	14.5	16.6	18.3
Total engineering construction	31.1	35.1	36.2	37.0	41.7
Total components	83.0	94.1	94.6	100.0	107.8

Sources: Natural Resources Canada; Statistics Canada, CANSIM II (Table 026-0013 – Residential Values, by Type of Investment and Related Table 031-0002 – Flows and Stocks of Fixed Non-Residential Capital, by North American Industry Classification System). (More information can be obtained on the Internet at the CANSIM II site at <http://www.statcan.ca/english/CANSIM>.)

Notes: Numbers may not add to totals due to rounding. Expenditures include value of new construction and major renovation work purchased.

**TABLE 5. WORLD PRODUCTION OF GYPSUM, 1999 AND 2000**

Country	1999	2000 <sup>e</sup>
	(000 tonnes)	
Canada	9 345	8 500
Australia	2 100	2 100
China	9 000	9 000
France	4 500	4 500
India	2 200	2 200
Iran	9 750	9 750
Japan	5 500	5 500
Mexico	7 000	7 000
Spain	7 500	7 500
Thailand	5 000	5 000
United Kingdom	1 800	1 800
United States	22 400	25 000
Other countries	20 780	20 800
Total world	106 875	108 650

Sources: Natural Resources Canada; U.S. Geological Survey, January 2001.

<sup>e</sup> Estimated.