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ANNUAL INDUSTRY REPORT

MANUFACTURES OF THE NON-METALLIC MINERALS GROUP

THE ARTIFICIAL ABRASIVES INDUSTRY, 1937.

The value of all products made by the artificial abrasives manufacturers in Canada during 1937 was 33 per cent greater than in 1936 and higher than in any other year on record. The gross factory value for the industry was $14,174,351 in 1937 compared with $10,631,533 in 1936, $13,851,785 in 1935, and $8,961,951 in 1929.

Sixteen establishments made artificial abrasives and abrasive products in 1937, 15 being in Ontario and 1 in Quebec. The average number of employees was 1,289 and payments in salaries and wages totalled $1,995,589. Expenditures for manufacturing materials amounted to $4,351,854, and $1,222,529 was paid out for fuel and electricity. Capital employed totalled $7,151,369 of which $3,416,068 represented the present value of plants and equipment.

Artificial abrasives were made in 5 works in Ontario and 1 in Quebec. The output of these works was valued at $12,193,254 including 25,644 tons of crude silicon carbide at $2,808,016; 85,604 tons of crude fused alumina at $8,435,371, and other products and by-products such as ferrosilicon, firesand, fused magnesia, refractory brick and cements, boron carbide, boron carbide shapes, artificial graphite, etc.. One of these works also made abrasive wheels and sharpening stones. An average of 965 persons were employed and salaries and wages totalled $1,519,063.

Ten other plants were occupied chiefly in making abrasive products such as wheels, paper, cloth, pulpstones and sharpening stones; 8 made wheels, segments, files, etc., and 2 made abrasive cloth and paper. The value of all products made in these establishments was $1,981,097. The number of employees was 324 and payments for salaries and wages amounted to $476,526.

The exports of crude artificial abrasives totalled 112,942 tons valued, for export purposes, at $6,544,454 during the calendar year 1937, all of the Canadian output being shipped to the United States for grinding and grading. The exports of abrasive wheels were valued at $141,214 in 1937.

The imports of crushed or ground artificial grains were appraised at $699,020 in 1937, and the imports of manufactured grinding wheels were valued at $106,232.

Table 1 - PRINCIPAL STATISTICS, 1936 and 1937.

	1936	1937	% change, 1937 from 1936
Number of firms	15	16	↗ 6.7
Capital employed $	6,241,502	7,151,369	↗ 14.6
Number of employees - On salary	247	245	- 0.8
On wages	902	1,044	↗ 15.7
Total	1,149	1,289	↗ 12.2
Salaries and wages - Salaries $	503,954	575,319	↗ 14.1
Wages $	1,024,240	1,420,270	↗ 38.7
Total $	1,528,194	1,995,589	↗ 30.6
Cost of fuel and electricity $	967,236	1,222,529	↗ 26.4
Cost of materials at works $	3,164,252	4,351,854	↗ 37.5
Selling value of products at works $	10,631,533	14,174,351	↗ 33.3

Table 2 - CAPITAL EMPLOYED, 1936 and 1937.

	1936	1937
	$	$
Present value of lands, buildings, machinery and equipment	2,997,891	3,416,068
Inventory value of materials, finished products, fuel and other supplies on hand, and stocks in process	2,046,944	2,181,608
Operating capital (cash, bills and accounts receivable, etc.)	1,196,667	1,553,693
TOTAL	6,241,502	7,151,369

Table 3 - WAGE-EARNERS, BY MONTHS, 1936 and 1937. (On the 15th of each month)

Month	1936	1937	Month	1936	1937
January	847	1,000	July	911	1,205
February	839	1,027	August	948	1,192
March	872	1,076	September	954	1,168
April	866	1,127	October	951	1,155
May	842	1,178	November	944	1,124
June	898	1,181	December	974	1,121
			AVERAGE	902	1,289

Table 4 - REGULAR HOURS WORKED PER WEEK BY WAGE-EARNERS, 1936 and 1937. (Overtime not included)

Hours worked per week	Per cent of wage-earners 1936	1937	Hours worked per week	Per cent of wage-earners 1936	1937
40 hours or less	5.0	7.7	51 - 53 hours	1.2	1.0
41 - 43 hours	3.4	1.0	54 hours	0.2	...
44 hours	6.0	4.3	55 hours	0.4	0.2
45 - 47 hours	9.5	4.6	56 - 59 hours	4.1	4.9
48 hours	61.2	71.3	60 hours or over	4.2	0.5
49 - 50 hours	4.8	4.5			

Table 5 - FUEL AND ELECTRICITY USED, 1936 and 1937.

Kind	Unit of measure	1936 Quantity	1936 Cost at works	1937 Quantity	1937 Cost at works
			$		$
Bituminous coal - Canadian	short ton	222	1,476	173	1,317
Imported	short ton	5,568	36,739	6,782	44,219
Anthracite coal (for fuel only)	short ton	405	4,259	390	3,646
Coke (for fuel only)	short ton	86	757	89	794
Fuel oil	Imp. gal.	159,024	9,640	181,328	12,066
Gas - Manufactured	M cu.ft.	925	617	822	667
Natural	M cu.ft.	1,829	1,305	2,082	1,503
Other fuel	$	...	45	...	158
Electricity purchased	K. W. H.	352,271,105	912,398	419,282,048	1,158,159
TOTAL	$	...	967,236	...	1,222,529

Table 6 - POWER EQUIPMENT, 1936 and 1937.

	1936 Number of units	1936 Total rated horse power	1937 Number of units	1937 Total rated horse power
Gasoline engines - Ordinarily in use	...	...	1	26
Electric motors run by purchased power -				
Ordinarily in use	675	6,703	661	6,696
In reserve or idle	77	805	89	1,010
Electric motors run by regenerated power -				
Ordinarily in use	...	...	75	265
Boilers - Ordinarily in use	11	550	10	691
In reserve or idle	1	75	...	...

Table 7 - MATERIALS USED IN MANUFACTURING, 1936 and 1937.

Materials	1936 Quantity	1936 Cost at works	1937 Quantity	1937 Cost at works
	Tons of 2,000 lb.	$	Tons of 2,000 lb.	$
Bauxite and pure alumina	67,681	1,493,571	102,843	2,200,551
Coal (not for fuel) - For fused alumina	770	4,138	1,140	5,928
For silicon carbide	7,459	44,708	6,416	38,519
Coke (not for fuel) - For fused alumina	3,333	17,568	5,910	30,416
For silicon carbide	24,745	332,010	25,734	345,241
Electrodes	1,064	134,605	1,580	203,155
Feldspar	36	999	53	1,503
Iron borings	5,987	49,089	10,025	107,827
Salt	337	2,671	338	2,786
Sawdust	8,845	28,096	9,277	26,431
Silica sand	44,455	217,499	45,240	211,899
Artificial abrasive grains	2,667	310,355	2,364	406,479
Natural abrasive grains - Garnets	101	17,849	164	28,951
Other	114	6,538	200	12,956
Bonding and bushing materials -				
(a) Clay bonds	265	17,038	370	22,511
(b) Elastic mixture	9	4,264	26	9,846
(c) Bakelite and synthetic resins	33	24,563	54	37,926
(d) Lead for bushings	25	3,087	35	4,655

Table 7 - MATERIALS USED IN MANUFACTURING, 1936 and 1937 (concluded)

Materials	1936 Quantity	1936 Cost at works	1937 Quantity	1937 Cost at works
		$		$
Cotton cloth	...	91,329	...	103,599
Kraft and rope paper	...	6,381	...	119,223
Containers, boxes, packages, etc.	...	25,992	...	46,063
All other materials	...	331,902	...	385,389
TOTAL	...	3,164,252	...	4,351,854

Table 8 - PRODUCTS MANUFACTURED, 1936 and 1937.

Product	1936 Short tons	1936 Selling value at works	1937 Short tons	1937 Selling value at works
		$		$
Crude silicon carbide	23,805	2,299,602	25,644	2,808,016
Crude fused alumina	59,533	5,762,217	86,604	8,435,371
Silicon carbide firesand, etc.	2,411	38,800	703	11,192
Abrasive wheels and segments.	...	862,283	...	1,165,406
Sharpening stones and files	...	89,524	...	95,317
Ferrosilicon	6,935	81,295	7,396	94,824
Other products (x)	...	1,497,812	...	1,564,225
TOTAL	...	10,631,533	...	14,174,351

(x) Includes abrasive cloth, abrasive paper, tiles, artificial pulpstones, artificial graphite, boron carbide, boron carbide shapes, calcium boride, fused magnesia, refractory cements, firebrick, etc., each of which was reported by only one or two companies.

Table 9 - PRODUCTION OF CRUDE ARTIFICIAL ABRASIVES IN CANADA, 1923 - 1937.

Year	Crude Silicon Carbide Quantity	Crude Silicon Carbide Selling value at works	Crude Fused Alumina Quantity	Crude Fused Alumina Selling value at works	TOTAL Quantity	TOTAL Selling value at works
	Tons	$	Tons	$	Tons	$
1923	12,660	1,382,747	32,201	3,620,497	44,861	5,003,244
1924	15,207	1,773,864	29,822	3,170,205	45,029	4,944,069
1925	16,945	1,864,009	30,337	3,281,708	47,282	5,145,717
1926	17,958	1,732,942	34,649	3,423,526	52,607	5,156,468
1927	17,333	1,961,910	35,086	3,230,928	52,419	5,192,838
1928	19,008	2,098,199	39,413	3,786,113	58,421	5,884,312
1929	21,592	2,577,033	53,857	4,974,789	75,449	7,551,822
1930	22,778	2,111,476	42,894	3,376,908	65,672	5,488,384
1931	10,754	1,060,712	35,781	3,007,307	46,535	4,068,019
1932	3,164	269,405	6,658	427,628	9,822	697,033
1933	7,887	765,192	20,967	1,726,191	28,854	2,491,383
1934	16,398	1,858,746	44,596	3,955,837	60,994	5,814,583
1935	18,475	1,788,657	51,194	4,735,019	69,669	6,523,676
1936	23,805	2,299,602	59,533	5,762,217	83,338	8,061,819
1937	25,644	2,808,016	86,604	8,435,371	112,248	11,243,387

Table 10 - PRODUCTION OF ARTIFICIAL ABRASIVE WHEELS AND SEGMENTS(x) IN CANADA, 1923 - 1937.

Year	Selling Value at works $	Year	Selling Value at works $
1923	566,426	1931	347,345
1924	425,384	1932	293,528
1925	426,341	1933	336,647
1926	619,124	1934	569,764
1927	634,007	1935	785,777
1928	847,489	1936	862,283
1929	819,884	1937	1,165,406
1930	546,276		

(x) Sharpening stones and artificial pulpstones not included.

DIRECTORY OF FIRMS IN THE ARTIFICIAL ABRASIVES AND ABRASIVE PRODUCTS INDUSTRY, 1937.

Names of Firms and Addresses	Products
(a) ARTIFICIAL ABRASIVES	
Abrasive Co. of Canada, Ltd., The 858 Burlington St. E., Hamilton, Ont.	Crude fused alumina; ferrosilicon.
Canadian Carborundum Co. Ltd., H.O. - Box 65, Niagara Falls, Ont. Plants - Shawinigan Falls, P.Q., Niagara Falls, Ont.	Crude silicon carbide; crude fused alumina; ferrosilicon; firesand; refractory brick; refractory cements.
Exolon Company, The H.O. - Blasdell, N.Y., U.S.A. Plant - Thorold, Ont.	Crude silicon carbide; crude fused alumina; firesand; ferrosilicon; graphite; calcium boride.
Lionite Abrasives, Ltd. H.O. - P.O. Box 3, Niagara Falls, Ont. Plant - Stanley St., Niagara Falls, Ont.	Crude fused alumina; ferrosilicon.
Norton Company, H.O. - Worcester, Mass., U.S.A. Plant - Chippawa, Ont.	Crude fused alumina; crude silicon carbide; crude boron carbide; boron carbide shapes; periclase (fused magnesia); ferrosilicon.
(b) ABRASIVE PRODUCTS	
Brantford Grinding Wheel Co. Ltd., 186 Pearl St., Brantford, Ont.	Abrasive wheels.
Canada Sand Papers Limited, H.O. - Box 260, Preston, Ont. Plant - Plattsville, Ont.	Abrasive cloth; abrasive paper.
Canadian Carborundum Co. Ltd., Niagara Falls, Ont.	Abrasive wheels; sharpening stones, and files.
Canadian Hart Grinding Wheel Co., 491 Dundas St., Galt, Ont.	Abrasive wheels and segments; sharpening stones and files.

DIRECTORY OF FIRMS IN THE ARTIFICIAL ABRASIVES AND ABRASIVE PRODUCTS INDUSTRY, 1937. (concluded)

Names of Firms and Addresses	Products
(b) ABRASIVE PRODUCTS (concluded)	
Dominion Abrasive Wheel Co. Ltd. 49 Main St., Mimico, Ont.	Abrasive wheels and segments; sharpening stones and files.
Empire Abrasives, The 24 Lewis St., Brantford, Ont.	Abrasive wheels and segments; sharpening stones and files.
Lion Grinding Wheels, Ltd., 192 Pearl St., Brockville, Ont.	Abrasive wheels and segments; sharpening stones and files.
Norton Company of Canada, Ltd., 3 Beach Road, Hamilton, Ont.	Abrasive wheels; artificial pulpstones; tiles; sharpening stones and files.
Ontario Abrasive Wheels Limited, Prescott, Ont.	Abrasive wheels; sharpening stones and files.
Canadian Durex Abrasives Limited H.O. - 154 Pearl St., Toronto, Ont. Plant - Brantford, Ont.	Abrasive cloth; abrasive paper; adhesive tape; and processed material.
The Wright Abrasives, 54 Alanson St., Hamilton, Ont.	Abrasive wheels and segments; sharpening stones and files.

Table 11 - IMPORTS INTO CANADA and EXPORTS OF ABRASIVES, 1936 and 1937.

	1936		1937	
	Quantity	Value	Quantity	Value
		$		$
IMPORTS				
Artificial abrasive grains, crushed or ground for use in Canadian manufactures	...	520,655	...	699,020
Diamond dust or bort and black diamond for borers	...	2,429,480	...	4,630,037
Diatomaceous earth or infusorial earth (Kieselguhr), ground or unground . Cwt.	57,031	78,687	43,940	63,917
Emery in bulk, crushed or ground	...	43,535	...	60,030
Grinding wheels, manufactured by the bonding together of either natural or artificial abrasives	...	85,545	...	106,232
Grinding stones or blocks, manufactured by the bonding together of either natural or artificial abrasives	...	7,339	...	16,353
Manufactures of emery or of artificial abrasives, not otherwise provided for	...	55,305	...	62,864
Grindstones, not mounted, and not less than 36 inches in diameter ..... No.	1,013	122,028	1,587	157,699
Grindstones, not otherwise provided for ..... No.	5,180	6,968	7,133	11,306
Pumice and pumice stone, lava and calcareous tufa, not further manufactured than ground	...	21,275	...	26,238

Table 11 - IMPORTS INTO CANADA AND EXPORTS OF ABRASIVES, 1936 and 1937. (concluded)

	1936 Quantity	1936 Value $	1937 Quantity	1937 Value $
IMPORTS (concluded)				
Sand paper, glass, flint and emery paper and emery cloth	...	85,398	...	80,521
TOTAL	...	3,456,215	...	5,914,217
EXPORTS				
Abrasives, natural, n.o.p., in ore or bulk, crushed or ground, including infusorial earth, rotten stone, tripoli, etc. Cwt.	9,561	15,200	8,422	13,153
Abrasives, artificial, crude, including carborundum Cwt.	1,703,721	5,132,041	2,258,435	6,544,454
Abrasives, artificial, made up into wheels, stones, etc.	...	129,431	...	141,214
Grindstones, manufactured	...	1,688	...	135
TOTAL	...	5,278,360	...	6,698,956

APPENDIX

NATURAL ABRASIVES - Nine firms in Canada produced natural abrasives during 1937; 3 were in Ontario, 3 in British Columbia, 2 in Nova Scotia, and 1 in New Brunswick. Production amounted to $40,035.

GRINDSTONES, PULPSTONES and SCYTHESTONES - Quarries for the production of these products are located at Shediac, Stonehaven, and in the parish of Derby, New Brunswick, also in Pictou county, Nova Scotia, also on the northwest end of Gabriola Island, British Columbia.

Production in 1937 included shipments from one plant in each of these three provinces and totalled 412 tons valued at $21,429.

Pulpstones are used in magazine grinders in Canadian pulp mills but as deposits containing thick beds of the proper quality sandstones are scarce in Canada, this country supplies only a very small percentage of the number annually. Artificial pulpstones made of silicon carbide or fused alumina segments are gradually replacing the natural stones.

VOLCANIC DUST - No production has been reported since 1934. This material is used as an abrasive base in scouring and cleaning compounds. Deposits occur in Saskatchewan, Alberta, and British Columbia.

DIATOMITE - Shipments of diatomite were made in 1937 from deposits located at New Annan, Nova Scotia, in Muskoka district, Ontario, and Quesnel, British Columbia. Diatomite is used as a filter aid, for insulation purposes, concrete admixture, and as a silver polish base. Six firms were producing in 1937 when production totalled 643 tons valued at $18,606.

CORUNDUM - Corundum mining practically ceased in Canada with the commercial production of artificial abrasives by the electric furnace. The last recorded output of the mineral in the Dominion was in 1921 when grain corundum amounting to 403 tons valued at $55,965 was exported to the United States. Corundum crystals are found in an area including several townships in Renfrew and Hastings counties in the province of Ontario. The commercial production of corundum began in this part of Ontario about 1900 with shipments reaching a maximum in 1906.

GARNETS - No commercial production of garnets has been reported in Canada for several years. During 1935 a garnetiferous rock was crushed and screened in a mill located at Labelle, Quebec; the product was marketed for sandblasting. In 1936 a small amount of development work was reported as having been conducted on a garnet deposit located in Joly township, La Belle county, Quebec. A deposit of garnets in Ashby township, Ontario, was operated during 1923 and 1,250 tons of garnet concentrates and crude garnets were shipped to Niagara Falls, N.Y., for use as an abrasive material; there was also a shipment of 360 tons of garnets from this same deposit in 1924.

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