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CANADA

DEPARTMENT OF TRADE AND COMMERCE

DOMINION BUREAU OF STATISTICS

CENSUS OF INDUSTRY

MINING, METALLURGICAL & CHEMICAL BRANCH

THE CLAY & CLAY PRODUCTS INDUSTRY IN CANADA 1941

(including 1. Products from Domestic Clays
2. Products from Imported Clays)

OTTAWA
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THE CLAY AND CLAY PRODUCTS INDUSTRY, 1941

The industrial clays of Canada may be classified as common clays, stoneware clays, fireclays, and china clays. Statistically, the ceramic industry of Canada is conveniently classified into two divisions: (1) Production from domestic clays, which includes the production of building brick, structural tile, drain tile, roofing tile, stoneware, sewer pipe, pottery and refractories, and (2) production from imported clays, which includes the manufacture of electrical porcelain, sanitary ware, sewer pipe, table ware, pottery, ceramic floor and wall tile, and various kinds of fireclay refractories.

A total of 164 plants, representing in the aggregate, a capital investment of $22,846,741, operated in the domestic and imported clay products industries in Canada during 1941. These two industries provided employment for 4,531 persons during the year; their earnings totalled $5,145,317. The combined production in 1941 was valued at $12,947,189 compared with $10,348,338 in 1940.

1. PRODUCTION FROM DOMESTIC CLAYS, 1941

The gross value of Canadian producers' sales of domestic clays and products made from same totalled $7,575,336 in 1941 compared with $6,344,947 in 1940 and $13,004,645, the all-time high record established in 1929. Commercial production of domestic clay products in 1941 was reported from every province except Prince Edward Island; no output of these materials has as yet been recorded for the Yukon and Northwest Territories. Of the total value of sales in 1941, Ontario and Quebec firms contributed $3,087,616 and $1,944,358 respectively.

Sales of building brick in 1941 totalled 208,371 thousand, valued at $3,765,493. Sewer pipe shipments aggregated $1,4[illegible],380; hollow blocks, roofing and floor tile, $1,085,219; drain tile, $633,364, and pottery, including earthenware, $502,212.

Fireclay was mined during 1941 in Nova Scotia, Saskatchewan and British Columbia with sales of this material totalling 5,431 short tons valued at $35,475. Firebrick and other fireclay products made from Canadian clays were evaluated at $374,334. Bentonite shipments during the year under review amounted to 2,172 short tons valued at $7,830. Shipments of Kaolin were also reported from the province of Quebec in 1941; these totalled 2 short tons appraised at $30 and represented the first commercial production of the mineral in Canada since 1935.

The number of firms reported as active in the Canadian domestic clay products industry totalled 137 in 1941, of which 71 were located in Ontario, 24 in Quebec, 12 in Alberta, 9 in British Columbia, and the balance in Nova Scotia, New Brunswick, Saskatchewan and Manitoba. Capital employed by the industry was reported at $17,377,553, employees numbered 2,331, and salaries and wages paid amounted to $3,227,735. Fuel and electricity used during 1941 totalled $1,561,326, and chemicals and various other process supplies consumed were valued at $207,247.

Data relating to Canadian imports and exports of clay products are being generally withheld from publication until the termination of the war. Any

inquiries for such information should be addressed to the External Trade Branch of the Bureau of Statistics, Ottawa.

The following information has been abstracted from a report on clay and clay products as prepared by the Bureau of Mines, Ottawa:

"Common clays suitable for the production of building brick and tile are found in all the provinces of Canada.

"The largest producing area in Canada of stoneware clay or semi-fireclays is in the vicinity of Eastend and Willows, Saskatchewan. Large quantities of the clays from the area are selectively mined and shipped to Medicine Hat, Alberta, where, owing to the availability of cheap gas fuel, they are used extensively in the manufacture of stoneware, sewer pipe, pottery, tableware, etc.

"Stoneware clays and moderately refractory fireclays occur near Shubenacadie and Musquodoboit, Nova Scotia. Some of the Musquodoboit clay is used for the production of pottery, but it has not been extensively developed for ceramic use.

"Stoneware clays or low grade fireclays occur near Williams Lake, and Chimney Creek Bridge in British Columbia; in the Cypress Hills of Alberta; and near Swan River, Manitoba, but as they are difficult of access, there has been little or no development.

"Two large plants and a few small plants manufacture fireclay refractories from domestic clay. At one plant, about 50 miles south of Vancouver, a high grade, moderately plastic fireclay is extracted by underground mining from the clay beds in the Sumas Mountain, and the plant manufactures firebrick and other refractory materials. Another plant at Claybank, Saskatchewan, by selective mining, utilizes the highly plastic refractory clays from the "White Mud" beds of southern Saskatchewan.

"A small amount of the most refractory clays in the deposits near Shubenacadie is mined and used by the steel plant at Sydney, Nova Scotia, for refractory purposes and some of the Musquodoboit clay is used for stove linings. Almost all other manufacturers of fireclay refractories (including high temperature cements, plastic refractories, etc.) use imported clay.

"China clay has been produced commercially in Canada only from the vicinity of St. Remi d'Amherst, Papineau county, Quebec, where a group of open pits was operated for several years prior to 1933. The large-scale operation of this deposit has been under consideration for a number of years and a company was organized a few years ago to extract the kaolinized material by underground mining, to refine it into high grade china clay, and to recover washed silica sand as a by-product. Following its reorganization as Canada China Clay and Silica Products, Limited, the company constructed a modern plant and is equipped to carry out the washing process in accordance with the most up-to-date and scientific methods. The project is of special interest in view of the hazards involved in obtaining shipments of china clay from the United Kingdom for the paper, rubber, ceramic and other industries. The Canadian production of grades of silica sand suitable for the glass trade has also assumed much greater importance, now that the Belgian source of supply has been cut off. Canadian Kaolin-Silica Products' property at Lac Remi, Quebec, which was operated chiefly for the production of high grade silica sand, has been idle since the destruction of the plant by fire a few years ago.

"Several other interesting occurrences of kaolin, which is rather rare in Eastern Canada, have been discovered in Quebec in recent years. One of these, located on Thirty-One Mile Lake, near Point Comfort, Blake county, is being explored and some areas in the deposit yield china clay of a high grade in the crude state. The extent and uniformity of the deposit is not as yet proved but its possibilities as a source of high-grade fireclay are receiving attention. Kaolin has also been discovered near Brebeuf; on Lake Labelle; and near Chateau Richer in Quebec, but there has been little exploratory work on the deposits.

"Important deposits of high-grade, plastic, white-burning, and buff-burning clays occur on the Mattagami, Abitibi, and Missinaibi rivers in northern Ontario. Some of these can be classed as china clays, others as fireclays, and still others as ball clays. The deposits have attracted considerable interest in recent years but efforts to develop them have been handicapped owing to the distance of the deposits from industrial centres, and to the lack of transportation facilities.

"In British Columbia, along the Fraser river, about 25 miles above Prince George, is an extensive clay deposit parts of which yield a high grade of china clay. As china clay from England is difficult to obtain on the West Coast owing to shipping risks, consideration is being given to the possibility of using material from this deposit as a source of china clay suitable for the pulp and paper trade.

"In the manufacture of porcelain, sanitary ware, dinner ware, ceramic floor and wall tile, etc., china clay from England has been used almost entirely. Separate production figures are not published for these classes of ceramic ware as there are only one or two producers in each case. Canada also imports large quantities of china clay for use in the production of paper; in the rubber industry; and for other industrial purposes.

"Ball clays of high bond strength occur in the "White Mud" beds of southern Saskatchewan but as yet they have not been developed.

"Activated clays for oil bleaching are largely imported."

Table 1 - PRINCIPAL STATISTICS OF THE DOMESTIC CLAY PRODUCTS INDUSTRY IN CANADA, 1940 and 1941

		1940	1941
Number of plants		143	142
Capital employed	$	17,146,443	17,377,553
Number of employees - On salary		296	282
On wages		2,261	2,599
Total		2,557	2,881
Salaries and wages - Salaries	$	605,913	602,549
Wages	$	2,069,338	2,615,236
Total	$	2,675,251	3,217,785
Selling value of products (gross)	$	6,344,547	7,575,336
Cost of fuel and purchased electricity ...	$	1,282,593	1,561,326
Cost of process supplies	$	139,635	207,247
Net value of sales	$	4,922,319	5,806,763

Table 2 - PRINCIPAL STATISTICS, BY PROVINCES, DOMESTIC CLAY PRODUCTS INDUSTRY, 1937 - 1941

Province and year	Number of firms	Capital employed	Number of employees	Salaries and wages paid	Cost of process supplies used	Cost of fuel and electricity	Net value of sales
		$		$	$	$	$
NOVA SCOTIA -							
1937	5	971,324	164	141,754	2,514	73,200	332,132
1938	5	928,033	146	136,445	2,948	64,121	273,184
1939	6	933,708	142	139,379	3,279	62,394	273,688
1940	5	904,621	153	141,513	6,256	84,858	333,629
1941	6	893,152	206	189,752	5,755	114,149	402,551
NEW BRUNSWICK							
1937	5	233,438	72	54,632	1,203	23,710	95,367
1938	5	253,124	80	55,667	2,069	25,403	96,147
1939	3	245,323	64	46,356	2,069	23,306	98,010
1940	5	253,017	70	53,245	2,846	33,360	130,533
1941	6	256,226	71	67,885	3,107	52,279	138,257
QUEBEC -							
1937	19	5,010,736	532	481,861	23,776	247,074	782,303
1938	19	4,572,040	491	458,737	33,030	235,148	754,016
1939	18	4,307,156	493	503,480	43,636	293,610	937,480
1940	19	3,864,494	570	600,028	49,409	378,710	1,118,127
1941	24	4,131,649	630	741,206	67,276	445,689	1,431,393
ONTARIO -							
1937	78	9,430,675	1,027	971,732	66,738	571,058	1,306,049
1938	84	8,340,292	956	905,432	66,631	493,113	1,523,637
1939	82	8,303,530	884	930,217	49,936	497,052	1,709,650
1940	75	7,618,378	1,058	1,130,232	67,340	626,659	1,814,541
1941	71	7,639,665	1,160	1,422,132	112,112	731,912	2,183,502
MANITOBA -							
1937	5	206,540	58	33,708	300	14,342	80,793
1938	4	252,534	68	53,375	480	23,278	81,506
1939	5	265,878	63	46,780	300	13,337	85,185
1940	5	257,954	63	56,302	407	19,654	82,365
1941	4	214,394	61	51,894	350	16,695	67,774
SASKATCHEWAN-							
1937	5	836,706	43	46,052	11,157	13,419	100,754
1938	6	825,363	33	38,301	324	10,832	107,007
1939	6	818,289	41	55,774	1,282	11,536	135,956
1940	6	787,034	48	53,264	1,138	13,212	145,471
1941	5	820,833	47	75,332	1,335	22,465	201,097
ALBERTA -							
1937	10	1,835,554	214	186,961	3,103	30,312	304,616
1938	10	1,941,331	269	261,974	2,267	25,891	343,179
1939	10	2,153,477	263	249,031	1,725	32,077	427,277
1940	12	2,503,514	411	336,777	4,435	44,322	782,459
1941	12	2,570,548	441	405,233	6,430	31,412	914,295

Table 2 - PRINCIPAL STATISTICS, BY PROVINCES, DOMESTIC CLAY PRODUCTS INDUSTRY, 1937 - 1941 (Concluded)

Province and year	Number of firms	Capital employed	Number of employees	Salaries and wages paid	Cost of process supplies used	Cost of fuel and electricity	Net value of sales
		$		$	$	$	$
BRITISH COLUMBIA -							
1937	10	905,130	170	172,972	4,681	56,027	288,932
1938	12	931,660	199	196,704	6,370	61,343	297,419
1939	11	912,128	210	200,120	6,457	58,171	306,512
1940	12	950,331	213	232,180	7,804	71,431	441,648
1941	9	850,426	221	273,511	10,882	86,720	460,824
CANADA -							
1937	137	20,427,232	2,287	2,004,702	103,568	1,032,755	3,320,536
1938	145	18,068,542	2,242	2,110,233	114,659	939,190	3,482,235
1939	141	17,940,742	2,165	2,161,683	108,815	998,683	4,048,738
1940	139	17,146,443	2,557	2,675,251	139,635	1,282,523	4,922,319
1941	137	17,377,553	2,881	3,227,785	207,247	1,561,326	5,806,763
1926	124	28,152,062	4,395	4,346,687	(x)	2,030,054	(x)

(x) Information not available.

Table 3 - AVERAGE NUMBER OF WAGE-EARNERS, BY MONTHS, 1939 - 1941

Month	1939	1940	1941 Pit	1941 Plant
January	838	1,190	147	1,760
February	745	1,051	121	1,671
March	900	1,287	122	1,749
April	1,358	1,739	196	2,231
May	2,286	2,647	393	2,857
June	2,741	3,143	427	2,942
July	2,879	3,191	399	2,882
August	2,761	3,027	332	2,708
September	2,428	2,812	283	2,581
October	2,047	2,530	255	2,373
November	1,975	2,300	204	2,220
December	1,572	2,151	163	1,990

Table 4 - NUMBER OF WAGE-EARNERS WHO WORKED THE NUMBER OF HOURS SPECIFIED, DURING ONE WEEK IN MONTH OF HIGHEST EMPLOYMENT

Hours	1941	Hours	1941
	No.		No.
30 hours or less	63	51 - 54 hours	601
31 - 43 hours	137	55 hours	180
44 hours	268	56 - 64 hours	839
45 - 47 hours	152	65 hours and over	150
48 hours	484	GRAND TOTAL	3,374
49 - 50 hours	450	Total wages paid in that week ..... $	72,702

Table 5 - FUEL AND ELECTRICITY USED, 1940 and 1941

Kind	Unit of measure	1940 Quantity	1940 Cost at works	1941 Quantity	1941 Cost at works
			$		$
Bituminous coal - Canadian ..	short ton	28,008	175,126	30,016	203,607
Imported ..	short ton	105,550	696,862	112,301	866,947
Anthracite coal - From United States ...	short ton	563	4,299	1,128	10,618
Other	short ton	455	3,052	250	1,915
Lignite coal	short ton	2,007	8,038	4,575	13,055
Coke	short ton	406	3,926	1,176	10,525
Gasoline	Imp. gal.	127,385	32,023	179,497	43,382
Kerosene or coal oil	Imp. gal.	7,217	1,587	2,053	492
Fuel oil	Imp. gal.	178,720	11,537	444,906	32,698
Wood	cord	39,288	144,962	42,887	170,411
Gas - Natural	M cu. ft.	824,878	29,396	668,965	18,630
Manufactured	M cu. ft.	18,760	4,003	827	335
Electricity purchased	K. W. H.	11,055,009	169,528	13,581,151	181,904
Other fuel	...	...	334	...	...
TOTAL	...	...	1,282,593	...	1,561,326
Electricity generated for own use	K. W. H.	285,707	...	262,000	...

Table 6 - POWER EQUIPMENT IN THE DOMESTIC CLAY PRODUCTS INDUSTRY, 1941

Description	Ordinarily in use: Number of units	Ordinarily in use: Total horse power (x)	In reserve or idle: Number of units	In reserve or idle: Total horse power (x)
Steam engines and steam turbines ...	49	4,576	4	230
Diesel engines	12	570	...	...
Gasoline, gas and oil engines, other than diesel engines	52	1,489	8	424
Electric motors -				
(a) Operated by purchased power ...	543	13,786	50	2,016
TOTAL	656	20,421	62	2,670
(b) Operated by power generated by the establishment	10	134	...	...
Stationary boilers	49	4,864	13	1,055

(x) According to manufacturers' rating.

Table 7 - PRODUCTION (SALES) OF DOMESTIC CLAY AND CLAY PRODUCTS IN CANADA, 1940-1941

Products	Unit of measure	SALES OR SHIPMENTS 1940 Quantity	1940 $	1941 Quantity	1941 $
Clay - Bentonite	ton	1,469	4,488	2,172	7,830
Fireclay	ton	4,381	30,564	5,431	35,475
Kaolin	ton	...	...	2	30
Other clay	ton	16,543	27,310	21,620	34,807
Fireclay blocks and shapes	...	...	85,187	...	120,487
Firebrick	M	3,167	165,525	3,843	183,807
Brick - Soft mud process--Face	M	15,946	323,634	14,288	285,260
Common ..	M	40,395	611,750	30,664	455,385
Stiff mud process--Face	M	41,552	903,636	52,419	1,218,632
(wire cut) Common ..	M	52,777	738,418	63,750	1,043,832

Table 7 - PRODUCTION (SALES) OF DOMESTIC CLAY AND CLAY PRODUCTS IN CANADA, 1940-1941 (Concluded)

Products	Unit of measure	SALES OR SHIPMENTS 1940 Quantity	1940 $	1941 Quantity	1941 $
Brick - Dry press--Face	M	14,932	333,717	15,621	333,908
Common	M	24,870	351,335	25,449	336,037
Fancy or ornamental brick (including special shapes, embossed and enamelled brick)	M	47	2,477	36	2,100
Sewer brick	M	694	12,222	644	10,273
Paving brick	M	19	819	120	7,312
Structural tile -					
Hollow blocks (including fireproofing and load-bearing tile)	ton	105,975	788,478	117,530	1,063,120
Roofing tile	...	...	1,339	...	750
Floor tile (quarries)	...	...	13,631	...	21,343
Drain tile	M	10,550	277,551	12,319	333,364
Sewer pipe (including copings, flue linings, conduits, etc.)	...	...	1,152,603	...	1,422,389
Pottery, glazed or unglazed (including coarse earthenware, sanitary ware, stoneware, flower pots, and all other pottery)	...	...	474,452	...	502,212
Other products	...	...	44,973	...	6,211
TOTAL	...	...	6,344,547	...	7,575,336

In addition to the clays recorded in the above table, there were 185,954 tons of ordinary clay consumed in Canada during 1941 in the production of Portland cement; the corresponding consumption in 1940 was 144,152 tons. Also consumed by the Canadian cement industry in 1941 were 26,837 tons of shale.

Table 8 - PRODUCTION (TOTAL SALES) OF CLAY PRODUCTS FROM DOMESTIC CLAYS, 1913-1941

Year	$	Year	$
1913	3,504,314	1928	12,381,718
1914	3,871,957	1929	13,904,343
1915	3,914,422	1930	10,503,578
1916	4,120,305	1931	7,841,233
1917	4,779,033	1932	3,850,218
1918	4,583,482	1933	2,222,835
1919	7,906,336	1934	2,830,410
1920	10,664,929	1935	3,012,563
1921	8,957,818	1936	3,471,027
1922	11,438,456	1937	4,513,839
1923	10,483,016	1938	4,536,084
1924	9,215,077	1939	5,151,236
1925	9,529,831	1940	6,344,547
1926	10,357,323	1941	7,575,336
1927	11,173,189		

In 1913 there were 455 active firms in the Canadian domestic clay products industry; men employed numbered 11,193 and $4,682,801 were distributed in salaries and wages. In 1918 the number of active firms was 230 and $2,131,614 were paid in wages to 3,423 employees.

Table 9 - PRODUCTION (TOTAL SALES) OF CLAY PRODUCTS, BY PROVINCES, 1938 - 1941
(Gross Values)

Province	1938	1939	1940	1941
	$	$	$	$
Nova Scotia	340,253	338,352	430,543	522,435
New Brunswick	133,625	152,325	171,745	195,643
Quebec	1,022,194	1,274,778	1,546,246	1,944,358
Ontario	2,083,436	2,340,363	2,502,540	3,037,616
Manitoba	105,354	78,892	102,303	84,817
Saskatchewan	118,713	148,774	164,823	224,837
Alberta	377,337	461,072	833,858	352,144
British Columbia	365,182	371,146	520,833	558,426
CANADA	4,536,084	5,151,238	6,344,547	7,575,336

Table 10 - PRODUCTION (SALES) OF BUILDING BRICK (a) - DOMINION TOTALS FOR YEARS SPECIFIED, 1905 - 1941

Year	M	$	Average value per M (b)	Year	M	$	Average value per M (b)
			$				$
1905 (x)	523,320	3,933,925	7.51	1933 ...	67,700	1,124,517	16.61
1914 ...	551,149	4,769,417	8.65	1934 ...	86,072	1,383,920	16.08
1926 ...	358,348	6,555,565	18.21	1935 ...	100,538	1,555,167	15.47
1927 ...	403,450	6,941,131	17.42	1936 ...	115,732	1,743,772	15.11
1928 ...	421,501	7,281,777	17.28	1937 ...	153,770	2,375,276	15.45
1929 ...	458,650	8,008,359	17.45	1938 ...	148,807	2,341,443	15.73
1930 ...	312,378	5,581,501	17.45	1939 ...	165,024	2,873,654	18.22
1931 ...	237,143	4,222,119	18.00	1940 ...	191,213	3,277,187	17.14
1932 ...	100,477	1,779,334	17.71	1941 ...	203,371	3,765,423	18.00

(a) Totals comparable with those in Table 12.
(b) Based on shipments of all grades and the value per M should be interpreted as the value of pressed, common and other varieties 'en masse' and not the value of any one particular type of brick.
(x) Quantity not recorded prior to 1905.

Table 11 - PRODUCTION OF BUILDING BRICK IN CANADA - PER CAPITA OF POPULATION FOR YEARS SPECIFIED

Year	M per capita	Year	M per capita
1905	0.087	1935	0.009
1914	0.070	1936	0.010
1926	0.046	1937	0.014
1930	0.031	1938	0.013
1932	0.010	1939	0.015
1933	0.006	1940	0.017
1934	0.008	1941	0.018

Table 12 - PRODUCTION (SALES) OF BUILDING BRICK (a) IN CANADA, BY PROVINCES, 1939 - 1941

Province	1939 M	1939 $	1940 M	1940 $	1941 M	1941 $
Nova Scotia	4,975	74,489	6,183	108,477	5,402	84,594
New Brunswick	5,371	78,074	6,605	114,832	7,210	110,370
Quebec	59,452	935,051	71,482	1,161,709	78,700	1,384,375
Ontario	71,691	1,270,978	77,106	1,482,278	88,484	1,786,717
Manitoba	4,099	69,353	5,581	86,483	4,688	78,300
Saskatchewan	992	16,653	1,230	18,832	981	18,864
Alberta	11,907	184,358	13,618	187,839	13,441	158,327
British Columbia ..	6,547	107,698	9,409	169,092	8,018	147,186
CANADA	165,024	2,676,634	191,215	3,277,187	208,871	3,765,493
Average value per M		$16.22		$17.14		$18.00

(a) Includes fancy and sewer brick.

Table 13 - VALUE (b) OF DRAIN TILE AND SEWER PIPE PRODUCED (SALES) IN CANADA, BY PROVINCES, 1939 - 1941

Province	1939 $	1940 $	1941 $
Nova Scotia	202,730	291,511	336,450
New Brunswick	1,588(x)	6,095	5,719
Quebec	103,383	141,498	210,390
Ontario	652,596	592,891	705,370
Manitoba	3,600(x)	4,025(x)	...
Saskatchewan	200(x)	...	400(x)
Alberta	114,605	273,832	334,318
British Columbia ...	88,649	150,842	168,006
CANADA	1,167,131	1,430,154	1,755,753

(b) Includes value of copings, flue linings, etc.
(x) Drain tile only.

Table 14 - VALUE (x) OF DRAIN TILE AND SEWER PIPE PRODUCED IN CANADA FOR YEARS SPECIFIED

Year	Value $	Year	Value $	Year	Value $
1912	1,242,503	1922	2,175,753	1931	1,337,213
1914	1,470,839	1924	2,005,649	1933	577,287
1916	1,075,674	1926	1,376,724	1935	688,925
1918	1,122,114	1928	2,379,693	1937	1,089,180
1920	2,111,742	1929	2,726,205		

(x) Includes value of copings, flue linings, etc.

Table 15 - PRODUCTION (SALES) OF FIRECLAY BLOCKS AND SHAPES AND FIREBRICK, BY PROVINCES, 1941

Province	FIRECLAY(x)		FIRECLAY BLOCKS and SHAPES	FIREBRICK	
	Short tons	$	$	M	$
Nova Scotia	3,315	11,155	1,481	11	495
New Brunswick ...	...	...	4,410	...	...
Saskatchewan	1,321	13,522	153,890	...	...
Alberta	...	...	...	60	3,027
British Columbia.	795	10,728	30,736	3,572	180,175
CANADA	5,431	35,475	190,497	3,643	183,697

(x) Does not include the entire quantity of clay shipped from Saskatchewan to Alberta for the manufacture of clay products.

Table 16 - PRODUCTION (SALES) OF FIRECLAY, FIRECLAY BLOCKS AND SHAPES, and FIREBRICK FROM DOMESTIC CLAY, 1932 - 1941

Year	FIRECLAY		FIRECLAY BLOCKS and SHAPES	FIREBRICK	
	Short tons	$	$	M	$
1932	990	11,826	75,203	1,580	71,757
1933	1,421	11,273	80,685	1,547	73,226
1934	1,043	12,593	62,568	2,109	101,218
1935	2,272	15,574	71,344	1,817	90,149
1936	2,437	17,683	65,171	2,548	118,923
1937	4,123	26,081	75,431	2,950	142,927
1938	2,344	17,245	73,512	2,213	113,531
1939	3,785	22,504	95,256	2,331	119,346
1940	4,881	30,564	85,127	3,167	165,525
1941	5,431	35,475	190,497	3,643	183,697

NOTE: Firebrick and fireclay blocks and shapes are made also from imported clays; see Table 36.

Table 17 - PRODUCTION (SALES) OF POTTERY FROM DOMESTIC CLAYS FOR YEARS SPECIFIED

Year	Value	Year	Value
	$		$
1883	27,750	1929	325,194
1898	214,675	1930	294,866
1908	300,541	1931	257,125
1913	53,533	1932	244,261
1918	130,242	1933	202,500
1923	229,547	1934	223,733
1924	233,242	1935	230,711
1925	267,255	1936	213,402
1926	320,135	1937	272,209
1927	307,057	1938	235,890
1928	356,093	1939	232,712(x)

(x) Includes value of sanitaryware.

Table 18 - PRODUCTION (SALES) OF POTTERY FROM DOMESTIC CLAYS, BY PROVINCES, 1940 and 1941

Province	1940	1941
New Brunswick	31,628	37,277
Quebec	...	13,921
Ontario	43,853	46,670
Alberta	381,650	401,114
British Columbia	11,321	3,230
CANADA	474,452	502,212

Table 19 - PRODUCTION OF STRUCTURAL TILE IN CANADA, BY PROVINCES, 1941

Province	HOLLOW BLOCKS (x) Short tons	HOLLOW BLOCKS (x) $	ROOFING TILE $	FLOOR TILE (QUARRIES) $
Nova Scotia	10,240	95,400	...	...
New Brunswick	3,366	26,357	...	...
Quebec	37,765	335,142	...	...
Ontario	55,771	512,430	552	21,135
Manitoba	400	4,227	...	...
Saskatchewan	1,625	13,700	...	...
Alberta	6,656	54,776	...	...
British Columbia ..	1,707	20,583	198	214
CANADA	117,530	1,063,120	750	21,349

(x) Including fireproofing and load-bearing tile.

Table 20 - PRODUCTION OF STRUCTURAL TILE IN CANADA, 1932 - 1941

Year	HOLLOW BLOCKS(x) Short tons	HOLLOW BLOCKS(x) $	ROOFING TILE No.	ROOFING TILE $	FLOOR TILE (QUARRIES) Sq.ft.	FLOOR TILE (QUARRIES) $
1932	48,118	421,672	48,950	3,900	94,316	21,502
1933	26,747	160,059	20,463	1,136	91,495	14,227
1934	31,136	244,122	44,115	1,352	80,356	17,491
1935	(a)47,195	344,608	82,015	3,680	51,765	7,620
1936	58,501	467,860	52,730	2,130	97,738	13,798
1937	64,526	533,845	60,542	3,302	73,191	12,169
1938	70,648	591,416	150,504	5,196	100,958	15,350
1939	86,120	714,291	148,291	4,964	90,812	15,233
1940	105,075	788,473	41,772	1,830	...	13,631
1941	117,530	1,063,120	...	750	...	21,349

(x) Including fireproofing and load-bearing tile.
(a) In addition, there was produced $615 worth of ceramic tile.

Table 21 - PRODUCTION (SALES) OF BENTONITE AND KAOLIN IN CANADA, BY PROVINCES, 1932 - 1941

Year	BENTONITE								KAOLIN (a)	
	Manitoba		Alberta		Br. Columbia		CANADA			
	Tons	$	Tons	$	Tons	$	Tons	$	Tons	$
1932 ...	...	...	...	...	7	176	7	176	...	...
1933 ...	...	...	...	...	55	1,363	55	1,363	...	...
1934 ...	...	...	...	...	63	1,578	63	1,578	48	504
1935 ...	...	...	...	...	41	781	41	781	170	1,580
1936 ...	....	...	...	...	120(b)	180	120(b)	180	...	...
1937 ...	138	1,154	...	...	31	817	169	1,971	...	...
1938 ...	...	...	1,138	3,444	43	215	1,179	3,659	...	...
1939 ...	22	591	889	2,850	...	...	888	3,441	...	...
1940 ...	710	2,023	714	2,240	45	225	1,469	4,488	...	...
1941 ...	760	1,330	1,317	5,882	95	618	2,172	7,850	2	30

(a) All from Quebec.
(b) Partly for experimental purposes.

BENTONITE
(Bureau of Mines, Ottawa)

Bentonite, mainly of the highly-colloidal, "swelling" variety, is widely distributed over large areas of the Prairie Provinces, where it occurs at several horizons in the Upper Cretaceous sediments. The more important known deposits are exposed mainly in areas dissected by drainage channels where they show as beds in the slopes bordering valleys, and in the sides or on top of small buttes in typical "badland" topography. Thus, many of the chief exposures are found in the Red Deer Valley section of Alberta; over a wide area in southern Saskatchewan; and in the district around Morden, in southern Manitoba. One lower-lying bed occurs as a persistent parting in the No. 1 or main coal seam mined at a number of points in the Drumheller district, Alberta, as well as near Cluny, farther east. Other exposures exist in the Edmonton region, Alberta, and farther west, on McLeod river, near Edson. In British Columbia, a deposit of unusual thickness occurs in Tertiary beds near Merritt and at Princeton.

Several of the above occurrences have been mined on a small scale, but the total production to date is comparatively small. Most of the output has been derived from the Drumheller area in the Red Deer Valley, Alberta, and from the Morden area, in Manitoba.

Canada exports little or no bentonite. Substantial quantities of activated clay of the Filtrol type are imported from the United States for bleaching in oil refineries and for packing-house products and possibly also some ground natural bentonite for similar use. Considerable quantities of American ground bentonite for foundry use and for other minor industrial purposes are also imported.

About 38 per cent of the sales in the United States in 1940 was used for oil bleaching, mostly after acid activation; 18 per cent in drilling muds; and 30 per cent in foundry work. A large part of the clay used in the activated form is obtained from Mississippi.

Canada probably possesses ample reserves of bentonite of foundry quality to supply domestic requirements, but freight rates to the main consuming centres have proved an obstacle to development in the face of low-priced American clay.

Wyoming dried and granulated clay sold in 1941 for $7.50 per ton, f.o.b. mines, in bulk, and air-floated 200-mesh material for $9.50 bagged, whereas similar material from Alberta has been quoted at $38. Selected, air-floated Wyoming clay was priced at $20 per ton f.o.b. Chicago. Freight rates from Wyoming points to Montreal are about $13.50 per ton. Imported activated (Filtrol-type) bentonite in 1941 cost $75 to $80 per ton, in carload lots, delivered eastern Canadian points, while American natural bleaching clay from Texas was quoted at $25 per ton laid down.

Table 22 - FULLER'S EARTH USED IN CANADA IN THE MANUFACTURE OF SOAPS AND WASHING COMPOUNDS AND IN THE PETROLEUM PRODUCTS INDUSTRY, 1931-1941

Year	Petroleum Products Industry		Soaps and Washing Compounds	
	Pounds (x)	$	Pounds	$
1931	18,157,532	201,381	422,174	6,284
1932	19,242,172	258,234	507,307	7,444
1933	22,811,635	314,315	582,434	8,501
1934	18,583,514	339,357	508,518	8,582
1935	18,487,142	360,885	860,018	13,604
1936	19,307,325	242,184	1,322,213	20,601
1937	18,845,458	240,302	1,187,768	20,303
1938	19,887,487	281,668	1,104,203	19,575
1939	19,814,473	304,214	1,586,163	30,924
1940	23,823,680	408,185	1,851,471	40,805
1941	30,155,750	571,010	1,486,005	39,332

(x) Includes all clays.

Table 23 - CHINA CLAY (KAOLIN) USED IN THE MANUFACTURE OF PAPER IN CANADA, 1931-1941

Year	Tons	Value	Year	Tons	Value
		$			$
1931	11,484	173,660	1937	41,738	572,825
1932	14,438	205,068	1938	34,368	488,147
1933	20,048	287,014	1939	32,703	450,092
1934	27,550	357,286	1940	36,931	558,658
1935	35,796	422,584	1941	32,844	588,585
1936	32,165	520,121			

Table 24 - CLAYS AND EARTHS USED IN CANADIAN RUBBER GOODS INDUSTRY, 1933 - 1941

Year	Tons	Value	Year	Tons	Value
		$			$
1933	1,731	32,381	1938	2,042	31,355
1934	2,731	54,368	1939	3,438	60,745
1935	2,833	63,553	1940	3,586	80,367
1936	3,017	70,703	1941	4,053	101,441
1937	3,814	72,300			

Table 25 - FIREBRICK AND FIRECLAY USED IN THE MANUFACTURE OF IRON AND STEEL AND THEIR PRODUCTS IN CANADA, 1931-1940

Year	FIREBRICK		FIRECLAY		OTHER FIRECLAY, FIREBRICK and CUPOLA BLOCKS
	Number	Value	Tons	Value	
		$		$	$
1931	4,326,000	107,684	7,631	64,300	45,335
1932	5,409,000	133,532	5,910	52,432	36,325
1933	1,346,016	141,784	7,615	68,602	11,628 (b)
1934	2,590,452	192,538	8,248	75,906	21,488
1935	(a)	451,694	11,510	101,661	28,064
1936	(a)	(a)	$ 772,014(c)	(a)	(a)
1937	(a)	(a)	$1,058,737(c)	(a)	(a)
1938	(a)	(a)	$ 832,012(c)	(a)	(a)
1939	(a)	(a)	$ 950,495(c)	(a)	(a)
1940	(a)	(a)	$4,681,943(c)	(a)	(a)

(a) Not published separately.
(b) From 1933 includes only cupola blocks.
(c) Combined value for firebrick, fireclay and other fireclay, etc.
NOTE: Corresponding data for 1941 are not yet complete.

Table 26 - FULLER'S AND INFUSORIAL EARTH USED IN SPECIFIED CANADIAN INDUSTRIES, 1932-1941

Year	Sugar Refineries		Vegetable Oil Mills	
	Pounds	$	Pounds	$
1932	(a)	(a)	102,650	1,773
1933	(a)	(a)	126,330	2,730
1934	(a)	(a)	115,120	2,171
1935	(a)	(a)	88,980	2,425
1936	58,200(b)	1,730	243,730	10,044
1937	4,736,788(c)	35,532	212,997(x)	9,349
1938	4,908,507(c)	101,473	190,253	9,063
1939	4,819,811(c)	105,711	207,105(b)	10,136
1940	4,984,362(c)	112,562	216,254(b)	7,731
1941	5,353,131(c)	133,129	275,290(b)	10,604

(a) Not recorded.
(b) Fuller's earth.
(c) Infusorial earth.
(x) Includes other earth.
NOTE: In addition to the consumption recorded, there is a considerable quantity of fuller's earth used by the slaughtering industry.

Table 27 - CONSTRUCTION CONTRACTS AWARDED IN CANADA(x) FOR YEARS SPECIFIED

Type	1929	1932	1939	1940	1941
	$	$	$	$	$
Residential	123,901,300	28,692,600	67,451,200	67,669,000	92,399,400
Business ..	190,181,700	32,592,200	54,945,200	104,590,500	100,552,100
Industrial.	62,968,800	7,820,400	22,755,000	121,760,300	92,805,300
Engineering	194,620,000	56,760,200	42,020,100	51,972,600	108,234,500
TOTAL ...	576,651,800	132,872,400	187,172,500	346,009,300	393,991,300

(x) Compiled by MacLean Building Reports Ltd., Toronto.

PRICES - (a)

BENTONITE - per ton, carload lots, f.o.b.Wyoming mines, dried and crushed, in bulk, $7.50; pulverized, 200 mesh, $8.50 in 100-lb. paper bags.

CHINA CLAY (KAOLIN) - per ton, f.o.b. South Carolina and Georgia mines. In bulk: saggar clays, $2.50 to $3.50; tailings, $4.50 to $5.00. No. 2 grades, $5.50 to $6.00; No. 1 grades, air-floated, crude, $6.75 to $8.00; No. 1 washed, $8.00. Florida: washed, crushed, bulk, $11.75; air-floated and washed, $14 to $15. Maryland: ball clays, shredded bulk, $5.00 to $7.00; air-floated, in paper bags, $10.10 to $12.25. New Jersey: plastic kaolin, pulverized, in paper bags, $10.25 to $10.75. Insecticide clay, $11.50 to $16.50. Imported English, per long ton, C and F. North American ports: lump, $26 to $28 in bulk; air-floated $40 to $60 nominal.

FULLER'S EARTH - per ton, f.o.b. Colorado, $9; f.o.b. Georgia or Florida, 30 to 60 mesh, $14.50; 15 to 30, $14; 200 and up, $10; 100 and up $7.

(b) - FULLER'S EARTH - English, long ton, nominal; Georgian, carlots, long ton $27.78.

CHINA CLAY - Imported, carlots, bulk, ton $25 to $50 (U.S. only). Pigment clay for rubber, carlots, bags, ton $25.00 less carlots, ton, $28.50. Kaolin (refined grades), cwt. $4.80, specially refined 10 cents a pound.

(a) "Engineering & Mining Journal's Metal & Mineral Markets" - New York, November, 1942.
(b) F.O.B. market at Toronto - "Canadian Chemistry & Process Industries" - Toronto, December, 1942.

II. PRODUCTS FROM IMPORTED CLAYS, 1941

This industry covers the operations of Canadian plants which were occupied chiefly in making ceramic products from imported clays. Products made in these plants during 1941 included high tension insulators, vitreous china sanitary ware, china dinnerware, firebrick, sewer pipe, floor and wall tile, refractory cements, electrical porcelains, etc.

Twenty-two plants reported in this group for 1941 and their output was valued at $5,371,853, against last year's total of $4,503,791 and the 1939 figure of $2,971,979. Capital employed amounted to $5,463,133. The average number of workers was 1,640 and payments for salaries and wages totalled $2,017,532. Fuel and electricity cost $388,106 and materials for use in manufacturing processes cost $1,331,808.

Table 28 - PRINCIPAL STATISTICS OF THE IMPORTED CLAY PRODUCTS INDUSTRY, 1940 and 1941

		1940	1941
Number of plants		21	22
Capital employed	$	5,359,190	5,463,133
Average number of employees		1,531	1,640
Salaries and wages	$	1,573,610	2,017,532
Cost of fuel and electricity	$	302,775	388,106
Cost of materials at works	$	1,634,669	1,331,808
Gross selling value of products at works	$	4,503,791	5,371,853

NOTE: Profits or losses cannot be calculated from above figures as data are not available for general expense items, such as, interest, rent, depreciation, taxes, insurance, advertising, etc.

Table 29 - CAPITAL EMPLOYED IN THE IMPORTED CLAY PRODUCTS INDUSTRY, BY PROVINCES, 1940 and 1941

Province	Present value of land, buildings, machinery and tools	Inventory value of materials and finished products on hand and stocks in process	Operating capital (cash bills and accounts receivable, etc.)	TOTAL CAPITAL EMPLOYED
	$	$	$	$
1 9 4 0				
Ontario	1,864,676	769,083	954,180	3,587,9[illegible]
Quebec .....) Saskatchewan)	1,128,358	228,196	414,697	1,771,251
CANADA ...	2,993,034	997,279	1,368,877	5,359,190
1 9 4 1				
Ontario	1,863,576	368,677	1,129,940	3,362,193
Quebec .....) Saskatchewan)	936,659	249,588	320,748	1,506,995
CANADA ...	2,800,235	1,218,265	1,450,688	5,469,188

Table 30 - EMPLOYEES, SALARIES AND WAGES IN THE IMPORTED CLAY PRODUCTS INDUSTRY, BY PROVINCES, 1940 and 1941

Provinces	Average Number of Employees: On Salaries Male	On Salaries Female	On Wages Male	On Wages Female	TOTAL	Salaries	Wages	TOTAL SALARIES and WAGES
						$	$	$
1 9 4 0								
Ontario	94	45	752	255	1,146	287,302	954,403	1,241,705
Quebec .....) Saskatchewan)	33	8	186	3	235	74,668	257,237	331,905
CANADA ...	127	53	938	263	1,381	361,970	1,211,640	1,573,610
1 9 4 1								
Ontario	100	52	912	273	1,342	324,632	1,307,797	1,632,429
Quebec .....) Saskatchewan)	60	10	220	8	298	83,990	301,114	385,103
CANADA ...	160	62	1,132	286	1,640	408,621	1,608,911	2,017,532

Table 31 - WAGE-EARNERS, BY MONTHS, IN THE IMPORTED CLAY PRODUCTS INDUSTRY, 1940 and 1941 (Number on pay-roll on the last work day of each month)

Month	1 9 4 0 Male	1 9 4 0 Female	1 9 4 0 TOTAL	1 9 4 1 Male	1 9 4 1 Female	1 9 4 1 TOTAL
January	802	248	1,050	1,070	283	1,353
February	832	247	1,079	1,080	282	1,362
March	843	251	1,094	1,088	287	1,375
April	868	236	1,104	1,115	271	1,386
May	883	256	1,139	1,154	276	1,430
June	902	234	1,136	1,131	274	1,405
July	930	233	1,163	1,144	261	1,405
August	989	271	1,260	1,127	272	1,399
September	1,047	280	1,327	1,192	296	1,488
October	1,062	299	1,361	1,166	310	1,476
November	1,037	301	1,338	1,164	310	1,474
December	1,041	301	1,342	1,139	305	1,442
AVERAGE	938	263	1,201	1,131	286	1,417

Table 32 - FUEL AND ELECTRICITY USED IN THE IMPORTED CLAY PRODUCTS INDUSTRY, 1940 and 1941

Kind	Unit of measure	1940 Quantity	1940 Cost at works	1941 Quantity	1941 Cost at works
			$		$
Coal, anthracite	ton	14	194	14	189
Coal, bituminous - Canadian	ton	724	4,352	18	177
Imported	ton	23,092	167,539	30,604	233,035
Coke	ton	1,248	9,984	1,507	15,283
Gasoline	Imp.gal.	12,604	3,286	11,263	3,259
Kerosene	Imp.gal.	2,162	273	2,124	357
Fuel oil	Imp.gal.	617,960	45,713	662,917	52,687
Wood	cord	45	166	21	117
Gas - Manufactured	M cu.ft.	728	638	26,321	20,304
Natural	M cu.ft.	52,671	41,384	38,893	27,343
Electricity purchased	K.W.H.	2,848,524	29,444	3,444,580	35,355
TOTAL	...	...	302,773	...	388,106
Electricity generated for own use	K.W.H.	770,933	...	935,129	...

Table 33 - POWER EQUIPMENT IN THE IMPORTED CLAY PRODUCTS INDUSTRY, 1940 and 1941

	1940 Number of units	1940 Total rated horse power	1941 Number of units	1941 Total rated horse power
Steam engines	3	465	3	415
Gasoline, gas and oil engines ..	...	...	1	40
Total Primary Equipment	3	465	4	455
Electric motors run by purchased power	555	2,253	533	2,290
TOTAL	558	2,718	537	2,745
Electric motors run by above primary units	34	366	38	673
Stationary boilers	8	458	24	1,223

Table 34 - MATERIALS USED IN THE IMPORTED CLAY PRODUCTS INDUSTRY, 1940 and 1941

Material	1940 Short tons	1940 Total cost at works	1941 Short tons	1941 Total cost at works
		$		$
Imported clays - Ball clay	3,348	53,300	3,746	71,366
China clay	3,532	72,182	3,504	76,738
Fireclay	34,153	203,744	39,423	277,448
Saggar clay	904	12,776	976	15,008
Other imported clays ...	4,732	16,151	1,131	20,323
Canadian clays - Fireclay	2	20	2	20
Other clays	100	1,300	215	1,669
Feldspar	3,303	70,733	3,333	74,247
Silica and ground quartz	3,426	53,800	4,055	63,116
Talc	511	7,655	762	11,342
Other glazing materials	...	35,773	...	37,742
Insulator hardware	...	238,076	...	330,575
Shipping containers and packing materials	...	105,349	...	149,730
All other materials	...	203,285	...	301,148
TOTAL	...	1,084,362	...	1,331,603

Table 35 - PRODUCTS MADE IN THE IMPORTED CLAY PRODUCTS INDUSTRY, 1940 and 1941

Products	1940 Gross selling value at works	1941 Gross selling value at works
	$	$
Firebrick and stove linings - Rigid	534,943	661,633
Plastic	148,904	193,095
High temperature cements	87,418	105,467
High tension porcelain insulators, china sanitary ware, clay sewer pipe, floor and wall tile, pottery, china tableware, etc. ..... (Separate figures cannot be shown for these items as there were only one or two producers in each case)	3,754,526	4,411,660
TOTAL	4,525,791	5,371,855

NOTE: Clay firebrick, floor tile, sewer pipe and pottery are also made in Canada from domestic clays (See tables 7 and 30). High temperature cements and refractory bricks are made also by concerns in other industries (see tables 36 and 37).

Table 36 - TOTAL PRODUCTION IN CANADA OF REFRACTORY SHAPES, 1930 - 1941

Year	From domestic clays: Fireclay blocks and shapes	Firebrick		Silica brick		Other (x): Rigid firebrick and stove linings	TOTAL
	$	M	$	M	$	$	$
1930 ...	147,300	3,780	177,608	2,418	97,379	296,945	721,241
1931 ...	85,050	2,248	107,507	900	35,748	280,585	506,070
1932 ...	75,200	1,530	71,757	93	4,504	212,838	364,108
1933 ...	80,825	1,547	75,286	850	28,185	280,484	397,530
1934 ...	82,388	2,100	101,210	2,528	85,245	275,472	525,094
1935 ...	71,344	1,817	90,149	2,461	93,134	314,885	572,512
1936 ...	85,171	2,548	118,928	2,535	97,285	330,002	611,991
1937 ...	75,451	2,950	142,827	3,744	181,182	441,541	840,725
1938 ...	73,512	2,213	113,581	1,738	100,403	448,484	735,000
1939 ...	85,256	2,321	118,348	2,423	124,807	540,576	879,735
1940 ...	85,127	3,187	165,525	3,458	182,780	922,078	1,355,510
1941 ...	100,427	5,843	195,807	4,111	250,455	1,198,096	1,810,855

(x) Includes shapes made from imported clays, from magnesite, etc., amounting to 32,800 tons in 1941.

Table 37 - TOTAL PRODUCTION IN CANADA OF REFRACTORY CEMENTS AND PLASTICS, 1932-1941

Year	Short tons	Selling value at works
		$
1932	...	113,402
1933	1,405	101,438
1934	2,112	142,230
1935	2,506	179,181
1936	2,784	212,607
1937	5,203	230,895
1938	7,155	277,687
1939	5,004	271,106
1940	10,915	630,450
1941	15,730	835,000