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ANNUAL INDUSTRY REPORT

CHEMICALS AND ALLIED PRODUCTS GROUP

THE COMPRESSED GASES INDUSTRY, 1940

Production from the manufacturing plants in Canada which were occupied chiefly in making industrial gases was valued at \$4,934,313 in 1940 compared with \$4,000,829 in 1939, an increase of 20.6 per cent.

Thirty-one factories were in operation in 1940, distributed as follows: 14 in Ontario, 6 in Quebec, 3 in Manitoba, 3 in Nova Scotia, 2 in Alberta, 2 in British Columbia, and 1 in Saskatchewan. These establishments employed capital amounting to \$5,593,557, of which \$3,262,870 was the value of land, buildings and equipment, \$469,908 was the value placed on inventories, and \$1,065,779 was the amount of working capital at the end of the year.

The average number of employees in this industry in 1940 was 736, including 367 salaried workers and 369 wage-earners. Salaries for the year amounted to \$659,422 and wages totalled \$457,567.

The chief products were oxygen, acetylene and carbon dioxide. The output of oxygen increased 36 per cent to 257,510,584 cubic feet, acetylene advanced 28 per cent to 62,075,617 cubic feet, and carbon dioxide gained 12 per cent to 14,153,284 pounds. The output of hydrogen declined 9 per cent to 45,784,089 cubic feet. Aqua ammonia, anhydrous ammonia, solid carbon dioxide, nitrogen and nitrous oxide were other products of this industry and were produced in about the same quantities as in 1939.

The Compressed Gases Industry, as reviewed in this bulletin, includes only those factories which make industrial gases as their main products. In addition, the Canadian Industries Limited produces synthetic ammonia at Windsor, Ont., liquid chlorine at Shawinigan Falls, Que., Windsor, Ont., and Cornwall, Ont., and liquid sulphur dioxide at Hamilton, Ont., but, when classified according to the main products, these plants come under the Acids, Alkalies and Salts Industry which is reviewed in a separate bulletin. Synthetic ammonia (and the hydrogen and nitrogen for its manufacture) is made also at Trail, B.C., by the Consolidated Mining and Smelting Company but the entire output is used by that company in the manufacture of ammonia fertilizers and a separate report is not submitted for the gas division. Similarly, acetylene is made by the Shawinigan Chemicals Limited at Shawinigan Falls, Que. and used in making acetic acid, etc., and nitrogen is produced by the North American Cyanamide Company at Niagara Falls as an intermediate in the manufacture of cyanamide.

Table 1 - PRINCIPAL STATISTICS FOR THE COMPRESSED GASES INDUSTRY, 1931 - 1940

Year	Number of plants	Capital employed	Average number of em- ployees	Salaries and wages	Cost of		Gross sell- ing value of products at works
					fuel and electricity at works	Cost of materials at works	
1931 ...	30	4,597,170	420	654,364	134,433	429,048	2,818,306
1932 ...	31	4,326,530	422	617,901	121,873	380,795	2,504,550
1933 ...	31	4,024,437	428	613,278	117,382	371,204	2,430,215
1934 ...	28	3,734,447	446	646,981	116,837	378,111	2,803,840
1935 ...	28	4,316,244	510	741,631	137,134	433,045	3,077,765
1936 ...	28	4,565,549	568	823,714	141,395	490,041	3,360,230
1937 ...	27	4,605,170	606	919,773	140,221	527,410	3,920,242
1938 ...	30	4,938,766	654	1,018,694	147,922	506,003	3,753,600
1939 ...	51	5,501,069	672	1,037,718	156,372	501,108	4,009,829
1940 ...	51	5,398,557	736	1,105,462	173,685	643,259	4,934,313
% Change, 1940 from 1939 ...	..	..	1.8	+9.5	+ 6.3	+14.2	+23.1

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

Table 2 - PRINCIPAL STATISTICS, BY PROVINCES, 1939 and 1940

Province	Number of plants	Capital employed	Average number of em- ployees	Salaries and wages	Cost of		Gross sell- ing value of products at works
					fuel and electricity at works	Cost of materials at works	
<u>1939</u>							
Quebec .....	6	1,439,694	145	319,912	35,381	117,184	1,048,703
Ontario .....	14	2,437,111	328	533,010	76,438	215,516	1,673,545
Manitoba .....	3	419,224	56	85,164	10,194	44,571	360,714
Nova Scotia ...	3	415,988	48	71,252	15,652	42,071	306,740
Saskatchewan ...	1)						
Alberta .....	2)	789,052	95	128,380	18,707	61,708	620,127
British Columbia	2)						
CANADA ....	31	5,501,069	672	1,037,718	156,372	501,108	4,009,829
<u>1940</u>							
Quebec .....	6	1,516,099	147	236,517	40,933	161,767	1,527,765
Ontario .....	14	2,578,042	370	570,832	84,494	238,729	2,033,088
Manitoba .....	3	390,112	57	83,235	10,626	46,567	403,012
Nova Scotia ...	3	454,254	59	85,455	21,547	49,944	382,680
Saskatchewan ...	1)						
Alberta .....	2)	680,050	103	137,373	21,083	101,432	727,768
British Columbia	2)						
CANADA ....	31	5,598,557	736	1,105,462	173,685	643,259	4,934,313

Table 3 - SIZE OF ESTABLISHMENTS, 1940

	Number of plants	Capital employed	Average number of employees	Gross selling value of products at works
<b>(a) PRODUCTION</b>				
Under \$50,000 .....	7	394,415	56	236,458
\$50,000 to \$100,000 .....	7	859,574	84	477,648
Over \$100,000 .....	17	4,144,768	506	4,218,207
TOTAL .....	31	5,398,557	736	4,934,513
<b>(b) EMPLOYEES</b>				
1 to 10 .....	11	753,176	67	745,927
11 to 20 .....	6	787,846	87	446,147
Over 20 .....	14	3,857,535	582	3,742,259
TOTAL .....	31	5,398,557	736	4,934,513
<b>(c) CAPITAL EMPLOYED</b>				
Under \$50,000 .....	4	67,069	29	599,016
\$50,000 to \$100,000 .....	10	707,441	119	661,105
\$100,000 to \$200,000 .....	9	1,305,108	188	1,586,650
Over \$200,000 .....	8	3,318,939	400	2,087,542
TOTAL .....	31	5,398,557	736	4,934,513

Table 4 - CAPITAL EMPLOYED, 1939 and 1940

Province	Present value of land, buildings, machinery, tools and other equipment	Inventory value of materials on hand, stocks in process, fuel, finished products and miscellaneous supplies on hand	Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)		TOTAL CAPITAL EMPLOYED
			\$	\$	
<b>1939</b>					
Quebec .....	908,469	101,325	420,000	1,439,694	
Ontario .....	1,248,866	195,440	992,805	2,457,111	
Manitoba .....	287,478	35,482	152,264	419,224	
Other provinces	722,131	83,798	399,111	1,205,040	
CANADA ....	3,106,944	420,045	1,974,080	5,501,069	
<b>1940</b>					
Quebec .....	899,133	83,541	333,425	1,316,099	
Ontario .....	1,307,884	275,594	904,564	2,578,042	
Manitoba .....	258,223	43,241	88,643	390,112	
Other provinces	797,625	67,532	249,147	1,114,304	
CANADA ....	3,262,870	460,908	1,665,779	5,398,557	

Table 5 - EMPLOYEES, SALARIES AND WAGES, 1939 and 1940

Province	Average number of employees						Salaries	Wages	TOTAL SALARIES and WAGES
	On salaries		On wages		Male	Female			
	Male	Female	Male	Female		TOTAL			
<u>1939</u>									
Quebec .....	49	24	73	...	145	123,777	96,135	219,912	
Ontario .....	145	47	135	1	328	346,184	184,826	533,010	
Manitoba .....	21	7	28	...	56	50,397	34,167	85,164	
Other provinces	44	23	75	1	143	118,464	83,168	199,632	
CANADA ....	258	101	311	2	672	639,422	398,296	1,037,718	
<u>1940</u>									
Quebec .....	52	18	77	...	147	124,135	102,582	226,517	
Ontario .....	134	58	177	1	370	348,903	221,929	570,832	
Manitoba .....	19	9	29	...	57	45,073	33,212	85,285	
Other provinces	46	31	85	...	162	127,784	95,044	222,828	
CANADA ....	251	116	368	1	736	645,895	457,567	1,103,462	

Table 6 - WAGE-EARNERS, BY MONTHS, 1939 and 1940

Month	1939		1940		Month	1939		1940	
	Male	Female	Male	Female		Male	Female	Male	Female
January ....	302	1	318	1	July .....	334	1	394	1
February ...	300	1	312	1	August .....	322	1	303	1
March .....	303	1	315	1	September ..	322	1	374	1
April .....	310	1	322	1	October ....	312	2	363	1
May .....	308	1	341	1	November ...	306	2	360	1
June .....	311	1	370	1	December ...	312	1	369	1
					Average ..	311	1	368	1

Table 7 - HOURS WORKED PER WEEK BY WAGE-EARNERS, 1940 (In one week of month of highest employment; including overtime)

Hours worked per week	Number of wage-earners	Per cent of total	Hours worked per week	Number of wage-earners		Per cent of total
				of wage-earners	of total	
30 hours or less	18	4.5	51 - 54 hours .....	17	4.2	
31 - 43 hours ..	30	7.2	55 hours .....	3	0.7	
44 hours .....	80	19.2	56 - 64 hours .....	34	8.2	
45 - 47 hours ..	4	1.0	65 hours and over..	25	6.0	
48 hours .....	197	47.3	Total .....	416	100.0	
49 - 50 hours ..	8	1.9	Total wages paid in selected week ....			\$10,019

Table 8 - FUEL AND ELECTRICITY USED, 1939 and 1940

Kind	Unit of measure	1939		1940	
		Quantity	Cost at works	Quantity	Cost at works
Petroleum coal - Canadian	short ton	1,176	7,518	804	6,542
Imported	short ton	277	1,482	445	2,775
Anthracite coal .....	short ton	260	1,922	185	1,766
Coke (for fuel only) .....	short ton	341	3,657	737	3,174
Gasoline .....	Imp. gal.	...	...	2,299	582
Fuel oil .....	Imp. gal.	9,120	438	76,094	4,386
Gas - Manufactured .....	H cu. ft.	704	541	31,941	336
Natural .....	H cu. ft.	2,184	690	400,606	614
Other fuel .....	\$	...	3,892	...	4,266
Electricity purchased ....	K. W. H.	15,300,510	136,223	18,477,519	153,542
TOTAL .....	\$	...	156,372	...	178,683

Table 9 - POWER EQUIPMENT, 1939 and 1940

Kind	Ordinarily in use		In reserve or idle	
	Number of units	Total rated horse power	Number of units	Total rated horse power
<u>1939</u>				
Steam engines and steam turbines ..	6	638	...	...
Electric motors run by purchased power .....	212	6,514	15	219
TOTAL .....	218	7,152	15	219
Stationary boilers .....	3	517	...	...
<u>1940</u>				
Steam engines and steam turbines ..	4	361	...	...
Electric motors run by purchased power .....	238	6,440	10	149
TOTAL .....	242	6,801	10	149
Stationary boilers .....	3	517	...	...

Table 10 - MATERIALS USED, 1939 and 1940

Material	Unit of measure	1939		1940	
		Quantity	Cost at works	Quantity	Cost at works
Acetone .....	pound	179,201	10,225	231,890	27,092
Calcium carbide .....	ton	5,150	352,519	6,641	457,896
Coke .....	ton	4,752	56,154	4,044	53,115
Other materials(x) .....	\$	...	91,485	...	122,756
Cylinders purchased during the year	number	...	1,925	...	2,400
TOTAL .....	\$	...	501,108	...	648,259

(x) Includes ammonia liquor, ammonium nitrate, potassium carbonate, unpurified brewery gas, lime, soda ash, condensing water, etc.

Table 11 - PRODUCTS MANUFACTURED, 1939 and 1940

Product	Unit of measure	1 9 3 9			1 9 4 0		
		Quantity	Selling value at works		Quantity	Selling value at works	
Acetylene .....	cu.ft.	43,616,265	1,155,449		62,075,617	1,462,201	
Carbon dioxide in cylinders and solid..	pound	12,645,575	715,975		14,156,284	787,722	
Hydrogen .....	cu.ft.	50,497,656	141,172		45,784,089	154,063	
Oxygen .....	cu.ft.	189,050,687	1,724,844		257,519,584	2,212,537	
Other products (x) ...	\$		272,589		...	317,990	
TOTAL .....	\$		4,009,829		...	4,934,313	

(x) Includes aqua and anhydrous ammonia, nitrogen, and nitrous oxide, for which figures cannot be shown separately as each was produced by only one or two companies in this group.

Table 12 - PRODUCTION OF ACETYLENE, CARBON DIOXIDE, and OXYGEN, 1918 - 1940

Year	Acetylene Cubic feet	Carbon dioxide, solid and in cylinders		Oxygen Cubic feet
		Pounds		
1918 .....	5,484,755	2,742,632		33,880,000
1919 .....	11,634,646	3,571,681		34,768,587
1920 .....	16,121,701	3,582,149		54,618,400
1921 .....	15,663,702	3,567,431		53,612,271
1922 .....	17,631,590	3,263,908		52,448,907
1923 .....	21,729,109	3,755,628		72,637,943
1924 .....	19,229,042	3,423,953		68,331,575
1925 .....	24,384,431	3,650,547		68,685,155
1926 .....	27,814,736	3,896,524		86,989,015
1927 .....	31,195,055	4,706,519		112,757,727
1928 .....	37,342,101	5,535,275		138,688,619
1929 .....	46,009,766	6,818,800		166,066,394
1930 .....	44,181,816	7,469,845		152,419,201
1931 .....	37,048,521	6,437,150		120,326,797
1932 .....	33,744,251	7,161,477		92,838,715
1933 .....	32,387,512	6,287,017		93,511,573
1934 .....	37,599,346	5,630,801		113,940,515
1935 .....	30,952,685	8,307,160		136,059,706
1936 .....	41,315,630	10,124,202		151,500,660
1937 .....	48,310,646	9,183,645		194,446,735
1938 .....	45,594,062	11,530,694		173,932,296
1939 .....	48,616,265	12,645,575		189,030,687
1940 .....	62,075,617	14,156,284		257,519,584

Table 13 - CONSUMPTION OF CARBON DIOXIDE IN THE MANUFACTURE OF CARBONATED BEVERAGES  
(SOFT DRINKS), 1930 - 1939

Year	Quantity	Cost at		Year	Quantity	Cost at	
		Pounds	works			Pounds	works
1930 .....	3,403,694	241,915	\$	1935 .....	2,426,969	200,072	\$
1931 .....	2,596,592	217,262		1936 .....	3,401,510	261,282	
1932 .....	2,020,941	182,098		1937 .....	4,863,848	328,570	
1933 .....	1,905,884	173,782		1938 .....	5,150,520	383,524	
1934 .....	2,158,025	199,191		1939-In cylinders	4,957,744	403,068	
				Solid .....	768,793	44,813	

Table 14 - IMPORTS INTO CANADA OF CARBON DIOXIDE AND CHLORINE, 1938 - 1940  
(From the "Trade of Canada" - Calendar Years 1938-1940)

	Quantity	Value
<u>1 9 3 8</u>		\$
Carbon dioxide or carbonic acid gas .....	...	...
Chlorine, liquid, or chlorine gas .....	lb.	7,721,550 165,982
<u>1 9 3 9</u>		
Carbon dioxide or carbonic acid gas .....	...	...
Chlorine, liquid, or chlorine gas .....	lb.	10,602,006 215,207
<u>1 9 4 0</u>		
Carbon dioxide or carbonic acid gas .....	...	...
Chlorine, liquid, or chlorine gas .....	lb.	7,589,594 173,571

Table 15 - EXPORTS FROM THE UNITED STATES TO CANADA OF COMPRESSED AND LIQUEFIED  
GASES, 1938 and 1939  
(From "Foreign Commerce and Navigation of the United States" Calendar Years 1938  
and 1939)

	Quantity	1 9 3 8		1 9 3 9	
		Value	\$	Quantity	Value
Ammonia, anhydrous ....	pound	777,018	38,203	460,756	23,720
Chlorine .....	pound	7,054,488	192,361	10,238,320	189,793
Other gases .....	pound	572,601	77,515	512,119	78,702

DIRECTORY(x) OF FIRMS INCLUDED IN THE COMPRESSED GASES INDUSTRY IN CANADA, 1940

<u>Names of Firms</u>	<u>Location of Plants</u>	<u>Products Made</u>
Cheney Chemicals Limited	180 Duke St., Toronto, Ont.	Nitrous oxide
Air Liquid Society & Canadian Liquid Air Co. Ltd.	H.O. - 1111 Beaver Hall Hill, Montreal, P.Q. Plants - Halifax, Sydney, Montreal, Toronto, London, Winnipeg, Regina, Calgary and Vancouver.	Acetylene, oxygen and nitrogen

Compressed Gases

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DIRECTORY(x) OF FIRMS INCLUDED IN THE COMPRESSED GASES INDUSTRY IN CANADA, 1940 (Con.)

<u>Names of Firms</u>	<u>Location of Plants</u>	<u>Products Made</u>
Liquid Carbonic Canadian Corporation Limited	H.O. - 2120 Cabot St., Cote St. Paul, Montreal, P.Q. Plants - Dartmouth, Montreal(2), Toronto, St. Boniface, Edmonton and Vancouver.	Carbon dioxide in cylinders and solid
Dominion Oxygen Company, Limited	H.O. - Canada Life Bldg., 340 University Ave., Toronto, Ont. Plants - Montreal, Toronto and Sault Ste. Marie.	Oxygen and nitrogen, compressed air.
Prest-O-Lite Company of Canada,	H.O. - Canada Life Bldg., 340 University Ave., Toronto, Ont. Plants - Shawinigan Falls, Merriton and St. Boniface.	Acetylene
Canadian Industries Limited	H.O. 1135 Beaver Hall Hill, Montreal, P.Q. Plant - Toronto, Ont.	Aqua ammonia and anhydrous ammonia
Lever Brothers, Limited	209 Eastern Ave., Toronto, Ont.	Hydrogen & oxygen
The People's Gas Supply Co. Ltd.	2 Mill St., Ottawa, Ont.	Acetylene
Proctor & Gamble Co. of Canada Limited	Burlington St. E., Hamilton, Ont.	Hydrogen and oxygen
Swift Canadian Company, Limited	Keele St. and St. Clair Ave., Toronto, Ont.	Hydrogen
Wall Chemicals Limited	H.O. - 3445 Sunawich St. E., Windsor, Ont. Plants - Montreal, Toronto	Hydrogen, oxygen and acetylene, oxygen and carbon dioxide mixtures
Canada Packers Ltd.	H.O. - 2300 St. Clair Ave. W., Toronto, Ont.	Hydrogen

(x) The plants listed above are included under the Compressed Gases Industry as they make industrial gases as their chief products. The following works in other industries recover compressed or liquefied gases as minor products or as intermediates in the manufacture of other chemical products -

Canadian Industries Limited	- Windsor, Ont. Hamilton, Ont. Cornwall, Ont. Shawinigan Falls, Que.	Liquid chlorine, synthetic ammonia Liquid sulphur dioxide Liquid chlorine Liquid chlorine, liquid hydrogen peroxide
Shawinigan Chemicals Ltd.	- Shawinigan Falls, Que.	Acetylene (mostly used to make acetic acid, etc.)
North American Cyanamide Co. Ltd.	Niagara Falls, Ont.	Nitrogen (used to make cyanamide)
Consolidated Mining & Smelting Co. Ltd.	Trail, B.C.	Synthetic ammonia (and hydrogen and nitrogen for its manufacture) (Used to make fertilizers).



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