CANADA

DEPARTMENT OF TRADE AND COMMERCE

DOMINION BUREAU OF STATISTICS

CENSUS OF INDUSTRY

MINING, METALLURGICAL & CHEMICAL BRANCH

THE COMPRESSED GASES INDUSTRY

IN

CANADA

1936

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ANNUAL INDUSTRY BULLETIN

CHEMICALS AND ALLIED PRODUCTS GROUP

THE COMPRESSED GASES INDUSTRY, 1936.

Production from the manufacturing plants in Canada which were occupied chiefly in making compressed gases was valued at $3,360,220 in 1936 compared with $3,077,765 in 1935 and $2,803,840 in 1934.

The same 28 factories were in operation as in 1935; 13 were in Ontario, 5 in Quebec, 3 in Manitoba, 2 in Nova Scotia, 2 in Alberta, 2 in British Columbia, and 1 in Saskatchewan. An average of 568 workers were employed in these works during 1936.

The chief products were oxygen, acetylene, carbon dioxide and hydrogen and each of these was made in greater quantity than in 1935. The output of oxygen increased 11 per cent to 151,500,660 cubic feet; acetylene, 3.5 per cent to 41,315,830 cubic feet; carbon dioxide in cylinders, 10 per cent to 5,318,656 pounds, and hydrogen, 0.4 per cent to 40,313,740 cubic feet. Aqua and anhydrous ammonia, solid carbon dioxide, nitrogen, and nitrous oxide were the other products of this industry.

The Compressed Gases Industry, as reviewed in this report, includes only those factories which made industrial gases as their main products. In addition, liquid chlorine and synthetic ammonia were manufactured in the Sandwich plant of Canadian Industries Limited but data pertaining to these departments were not shown separately from the general plant operations and so have been included in the Acids, Alkalies and Salts Industry. Synthetic ammonia (and the hydrogen and nitrogen for its manufacture) was made also at Trail, B.C., by the Consolidated Mining and Smelting Company of Canada but as all of the output was used in making ammonia fertilizers, the statistics relating thereto have been included in the Fertilizers Industry. Similarly, acetylene was made by Shawinigan Chemicals Limited at Shawinigan Falls for use in their own works in making acetic acid, etc., and nitrogen was produced as an intermediate by the North American Cyanamid Company at Niagara Falls for use in the manufacture of calcium cyanamide. Pintsch gas for lighting railway coaches was made at several divisional points but these plants have always been classified to the artificial gas industry and again have been included in that group.

Table 1 - PRINCIPAL STATISTICS OF THE COMPRESSED GASES INDUSTRY, 1920 - 1936.

Years	No. of plants	Capital employed	Average number of employees	Salaries and wages	Cost of fuel and electricity at works	Cost of materials at works	Gross selling value of products at works
		$		$	$	$	$
1920	25	4,033,677	446	669,120	54,054	363,664	1,993,141
1921	26	4,218,484	318	508,932	35,405	301,839	2,001,898
1922	25	4,351,232	309	479,517	31,057	280,666	1,908,269
1923	23	4,472,896	300	461,764	92,541	488,879	2,165,445
1924	21	4,115,958	292	443,322	89,614	401,951	2,051,448
1925	20	3,420,104	325	481,595	83,309	370,569	2,086,613
1926	24	3,799,733	360	521,824	118,744	435,729	2,422,486
1927	25	4,177,794	404	604,417	133,097	550,795	2,625,698
1928	25	4,226,037	426	652,893	148,765	479,587	3,145,884
1929	28	4,995,560	542	770,424	155,685	785,377	3,967,416
1930	30	5,020,875	472	737,240	153,796	504,975	3,557,486
1931	30	4,597,170	420	654,364	134,433	429,048	2,818,306
1932	31	4,326,599	422	617,901	121,873	380,795	2,504,550
1933	31	4,024,437	428	613,278	117,382	371,204	2,490,215
1934	28	3,734,447	446	646,981	116,887	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	3,360,220

Table 2 - PRINCIPAL STATISTICS, BY PROVINCES, 1935 and 1936.

Provinces	No. of plants	Capital employed	Average number of employees	Salaries and wages	Cost of fuel and electricity at works	Cost of materials at works	Gross selling value of products at works
		$		$	$	$	$
1935							
Quebec	5	949,395	95	130,455	27,449	122,135	773,495
Ontario	13	2,357,458	271	406,879	77,541	181,880	1,336,629
Manitoba	3	283,430	45	59,583	7,307	32,064	263,878
Nova Scotia	2)						
Saskatchewan	1)	725,961	99	144,714	24,837	96,966	703,763
Alberta	2)						
British Columbia	2)						
CANADA	28	4,316,244	510	741,631	137,134	433,045	3,077,765
1936							
Quebec	5	1,061,069	109	158,403	25,593	120,389	810,482
Ontario	13	2,297,604	294	434,305	82,247	229,960	1,480,934
Manitoba	3	351,465	51	68,917	7,802	36,209	300,377
Nova Scotia	2)						
Saskatchewan	1)	855,411	114	162,089	25,753	103,483	768,427
Alberta	2)						
British Columbia	2)						
CANADA	28	4,565,549	568	823,714	141,395	490,041	3,360,220

Table 3 - SIZE OF ESTABLISHMENTS, 1936.

	Number of plants	Capital employed	Average number of employees	Selling value of products at works
		$		$
(a) PRODUCTION				
Under $50,000	9	841,009	73	307,907
$50,000 to $100,000	5	820,330	80	362,832
Over $100,000	14	2,904,210	415	2,689,481
TOTAL	28	4,565,549	568	3,360,220
(b) EMPLOYEES				
1 to 10	9	686,248	53	474,121
11 to 20	9	920,552	129	996,127
Over 20	10	2,958,749	386	1,889,972
TOTAL	28	4,565,549	568	3,360,220
(c) CAPITAL EMPLOYED				
Under $25,000	3	43,806	24	423,304
$25,000 to $100,000	10	628,628	126	965,162
$100,001 to $200,000	8	1,066,474	149	1,013,314
Over $200,000	7	2,826,641	269	958,440
TOTAL	28	4,565,549	568	3,360,220

Table 4 - CAPITAL EMPLOYED, 1935 and 1936.

Provinces	Present value of lands, 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
	$	$	$	$
1935				
Quebec	625,762	55,427	268,206	949,395
Ontario	1,148,236	104,632	1,104,590	2,357,458
Manitoba	223,073	20,916	39,441	283,430
Other provinces	571,383	43,333	111,245	725,961
CANADA	2,568,454	224,308	1,523,482	4,316,244
1936				
Quebec	788,266	120,681	152,122	1,061,069
Ontario	1,186,636	249,988	860,980	2,297,604
Manitoba	217,695	51,166	82,604	351,465
Other provinces	574,583	99,997	180,831	855,411
CANADA	2,767,180	521,832	1,276,537	4,565,549

Table 5 - EMPLOYEES, SALARIES AND WAGES, 1935 and 1936.

Provinces	Average number of employees					Salaries	Wages	TOTAL SALARIES AND WAGES
	On salaries		On wages					
	Male	Female	Male	Female	TOTAL			
						$	$	$
1935								
Quebec	34	7	52	2	95	74,091	56,364	130,455
Ontario	125	35	110	1	271	277,897	128,982	406,879
Manitoba	16	4	24	1	45	33,384	26,199	59,583
Other provinces	35	15	48	1	99	89,162	55,552	144,714
CANADA	210	61	234	5	510	474,534	267,097	741,631
1936								
Quebec	34	17	58	...	109	96,918	61,485	158,403
Ontario	135	41	118	...	294	294,616	139,689	434,305
Manitoba	18	7	26	...	51	41,663	27,254	68,917
Other provinces	39	19	56	...	114	103,124	58,965	162,089
CANADA	226	84	258	...	568	536,321	287,393	823,714

Table 6 - WAGE-EARNERS, BY MONTHS, 1935 and 1936.

Months	1935			1936		
	Male	Female	TOTAL	Male	Female	TOTAL
January	208	2	210	235	...	235
February	213	3	216	239	...	239
March	211	3	214	252	...	252
April	227	4	231	265	...	265
May	238	4	242	258	...	258
June	241	3	244	265	...	265
July	255	6	261	278	...	278
August	248	6	254	269	...	269
September	233	3	236	265	...	265
October	235	3	238	258	...	258
November	231	3	234	251	...	251
December	233	3	236	249	...	249
AVERAGE	234	5	239	258	...	258

Table 7 - FUEL AND ELECTRICITY USED, 1935 and 1936.

Kinds	Unit of measure	1935		1936	
		Quantity	Cost at works	Quantity	Cost at works
			$		$
Bituminous coal - Canadian	short ton	606	4,737	389	2,816
Imported	short ton	336	2,213	266	1,658
Anthracite coal	short ton	276	2,163	478	3,360
Coke	short ton	4,706	13,954	3,845	11,502
Gasoline	Imp. gal.	215	57	318	83
Kerosene	Imp. gal.	...	...	44	12
Fuel oil	Imp. gal.	9,980	509	11,175	570
Wood	cord	11	156	13	170
Gas - Manufactured	M cu.ft.	419	329	571	440
Natural	M cu.ft.	2,334	775	2,185	734
Other fuel	xxx	...	3,955	...	4,515
Electricity purchased	K. W. H.	13,561,790	108,286	13,922,286	115,535
TOTAL	xxx	...	137,134	...	141,395

Table 8 - POWER EQUIPMENT, 1935 and 1936.

Kinds	Ordinarily in use: Number of units	Ordinarily in use: Total rated horse power	In reserve or idle: Number of units	In reserve or idle: Total rated horse power
1 9 3 5				
Steam engines and steam turbines	5	290	1	40
Total Primary	5	290	1	40
Electric motors run by purchased power	154	4,980	...	...
TOTAL	159	5,270	1	40
Boilers	8	732	...	...
1 9 3 6				
Steam engines and steam turbines	6	728	...	...
Total Primary	6	728	...	...
Electric motors run by purchased power	167	4,813	13	185
TOTAL	173	5,541	13	185
Boilers	8	732	...	...

Table 9 - MATERIALS USED, 1935 and 1936.

Materials	Unit of measure	1 9 3 5: Quantity	1 9 3 5: Cost at works	1 9 3 6: Quantity	1 9 3 6: Cost at works
			$		$
Acetone	lb.	139,594	24,300	170,823	25,603
Calcium carbide	ton	4,333	260,876	4,402	275,375
Coke	ton	2,810	29,796	2,992	34,356
Other materials (x)	xx	...	79,645	...	85,915
Cylinders purchased during the year	No.	2,685	38,428	4,835	68,792
TOTAL	xx	...	433,045	...	490,041

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

Table 10 - PRODUCTS MANUFACTURED, 1935 and 1936.

Products	Unit of measure	1 9 3 5: Quantity	1 9 3 5: Selling value at works	1 9 3 6: Quantity	1 9 3 6: Selling value at works
			$		$
Acetylene	cu.ft.	39,922,683	975,710	41,315,830	1,016,256
Carbon dioxide in cylinders	lb.	4,849,687	429,775	5,318,656	445,195
Hydrogen	cu.ft.	40,134,386	50,402	40,313,740	74,345
Oxygen	cu.ft.	136,059,706	1,273,060	151,500,660	1,438,799
Other products (x)	xxx	...	348,818	...	385,625
TOTAL	xxx	...	3,077,765	...	3,360,220

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

Table 11 - PRODUCTION OF ACETYLENE, CARBON DIOXIDE (IN CYLINDERS), and OXYGEN, 1918 - 1936.

Years	Acetylene	Carbon Dioxide (in cylinders)(x)	Oxygen
	Cubic feet	Pounds	Cubic feet
1918	5,484,755	2,742,632	33,880,000
1919	11,684,646	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	3,355,628	72,637,943
1924	19,229,042	3,428,953	68,331,575
1925	24,384,431	3,650,547	68,685,153
1926	27,814,736	3,896,524	86,989,015
1927	31,195,053	4,706,519	112,757,727
1928	37,342,101	5,533,275	138,688,619
1929	46,009,766	6,818,800	166,066,394
1930	44,181,816	6,632,544	152,419,201
1931	37,048,521	5,437,464	120,326,797
1932	33,744,251	6,057,311	92,828,715
1933	32,387,312	5,410,993	93,511,573
1934	37,599,346	4,713,998	113,940,515
1935	39,922,683	4,849,687	136,059,706
1936	41,315,830	5,318,656	151,500,660

(x) Not including solid carbon dioxide (dry ice).

Table 12 - PRODUCTION OF ACETYLENE, CARBON DIOXIDE (IN CYLINDERS), and OXYGEN, BY PROVINCES, 1928 - 1936.

	Ontario	Quebec	Other Provinces	CANADA
ACETYLENE -				
1928 cu.ft.	14,032,110	11,203,260	12,106,731	37,342,101
1929 cu.ft.	18,463,129	12,854,099	14,692,538	46,009,766
1930 cu.ft.	18,569,197	11,463,532	14,149,087	44,181,816
1931 cu.ft.	14,680,022	9,483,373	12,885,126	37,048,521
1932 cu.ft.	12,962,120	8,141,640	12,640,491	33,744,251
1933 cu.ft.	12,004,827	7,879,957	12,502,528	32,387,312
1934 cu.ft.	14,680,380	9,209,022	13,709,944	37,599,346
1935 cu.ft.	16,733,379	10,295,232	12,894,072	39,922,683
1936 cu.ft.	17,581,043	10,348,716	13,386,071	41,315,830
CARBON DIOXIDE (IN CYLINDERS)(x) -				
1928 lb.	1,277,440	2,677,526	1,578,309	5,533,275
1929 lb.	1,453,180	3,687,948	1,677,672	6,818,800
1930 lb.	1,385,398	3,588,703	1,658,443	6,632,544
1931 lb.	1,538,928	2,668,100	1,230,436	5,437,464
1932 lb.	1,636,732	3,111,813	1,308,766	6,057,311
1933 lb.	1,564,607	2,819,946	1,026,440	5,410,993
1934 lb.	1,257,070	2,367,643	1,089,284	4,713,997
1935 lb.	1,414,171	2,221,970	1,213,545	4,849,687
1936 lb.	1,467,559	2,389,467	1,461,630	5,318,656

(x) Not including solid carbon dioxide (dry ice).

Table 12 - PRODUCTION OF ACETYLENE, CARBON DIOXIDE (IN CYLINDERS), and OXYGEN, BY PROVINCES, 1928 - 1936 (concluded)

	Ontario	Quebec	Other Provinces	CANADA
OXYGEN -				
1928 ..... cu.ft.	54,430,578	41,971,320	42,286,721	138,688,619
1929 ..... cu.ft.	66,116,620	50,714,300	49,235,474	166,066,394
1930 ..... cu.ft.	59,045,143	45,737,255	47,636,803	152,419,201
1931 ..... cu.ft.	44,420,908	38,162,619	37,743,270	120,326,797
1932 ..... cu.ft.	32,280,715	28,865,340	31,682,660	92,828,715
1933 ..... cu.ft.	34,991,667	27,093,759	31,426,147	93,511,573
1934 ..... cu.ft.	42,361,291	33,187,429	38,391,795	113,940,515
1935 ..... cu.ft.	54,375,346	37,926,890	43,757,470	136,059,706
1936 ..... cu.ft.	61,616,420	41,488,540	48,395,700	151,500,660

Table 13 - CONSUMPTION OF CARBON DIOXIDE IN THE MANUFACTURE OF CARBONATED BEVERAGES, (SOFT DRINKS), 1928 - 1935.

Years	Quantity	Cost at works	Years	Quantity	Cost at works
		$			$
1928	1,718,847	177,777	1932	2,020,941	182,098
1929	3,950,733	380,699	1933	1,905,884	173,782
1930	2,408,694	241,915	1934	2,138,025	199,191
1931	2,396,592	217,262	1935	2,496,969	209,672

Table 14 - IMPORTS INTO CANADA OF CARBON DIOXIDE AND CHLORINE, 1934 - 1936. (From the "Trade of Canada" - Calendar years 1934-1936).

		Quantity	Value
			$
1 9 3 4			
Carbon dioxide or carbonic acid gas		...	...
Chlorine, liquid, or chlorine gas	lb.	10,713,725	219,985
1 9 3 5			
Carbon dioxide or carbonic acid gas		...	...
Chlorine, liquid, or chlorine gas	lb.	10,436,566	221,134
1 9 3 6			
Carbon dioxide or carbonic acid gas		...	...
Chlorine, liquid, or chlorine gas	lb.	6,296,562	133,570

Table 15 - EXPORTS FROM THE UNITED STATES TO CANADA OF COMPRESSED AND LIQUIFIED GASES, 1934 and 1935.
(From "Foreign Commerce and Navigation of the United States" Calendar Years 1934 and 1935)

	1 9 3 4		1 9 3 5	
	Quantity	Value	Quantity	Value
		$		$
Ammonia, anhydrous ..... lb.	31,418	3,943	29,732	2,566
Chlorine ..... lb.	10,254,283	210,014	9,954,385	222,792
Other gases ..... lb.	1,392,965	101,180	1,483,882	110,903

DIRECTORY(x) OF FIRMS INCLUDED IN THE COMPRESSED GASES INDUSTRY IN CANADA, 1936.

Names of Firms	Location of Plants	Products Made
Cheney Chemical Limited	180 Duke St., Toronto, Ont.	Nitrous oxide.
L'Air Liquide Society & Canadian Liquid Air Co. Ltd.	H.O. - 1111 Beaver Hall Hill, Montreal, P.Q. Plants - Halifax, Montreal, Toronto, London, Winnipeg, Regina, Calgary and Vancouver.	Acetylene and oxygen.
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 carbon dioxide.
Dominion Oxygen Company, Limited	H.O. - Canada Life Bldg., 340 University Ave., Toronto, Ont. Plants - Montreal and Toronto.	Oxygen and nitrogen.
Prest-O-Lite Company of Canada, Limited	H.O. - Canada Life Bldg., 340 University Ave., Toronto, Ont. Plants - Shawinigan Falls, Merritton and St. Boniface.	Acetylene.
Canadian Industries Limited	H.O. - P. O. Box 1260 Montreal, P.Q. Plant - Toronto, Ont.	Aqua ammonia and anhydrous ammonia.
Lever Brothers, Limited	299 Eastern Ave., Toronto, Ont.	Hydrogen and oxygen.
The People's Gas Supply Co. Ltd.	2 Mill St., Ottawa, Ont.	Acetylene.
Proctor & Gamble Co. of Canada Limited	Burlington St., Hamilton Ont.	Hydrogen and oxygen.
Swift Canadian Company, Limited	Keele St. and St. Clair Ave., Toronto, Ont.	Hydrogen.
Wall Chemicals Ltd.	1103 Millwood Rd., Toronto, Ont.	Carbon dioxide in cylinders, and acetylene.
Carbo-Ice (Ontario) Limited	3 Laird Drive, Leaside, Ont.	Solid carbon dioxide and carbon dioxide in cylinders.

For Footnote(x) - see next page.

(x) The plants listed on page 8 are included under the Compressed Gases Industry as they make compressed gases as their chief product. In addition to these, Canadian Industries Limited produced synthetic ammonia and liquid chlorine at Sandwich, Ontario, and liquid sulphur dioxide at Hamilton, Ontario, 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 also made at Trail, B.C., by the Consolidated Mining and Smelting Company but is used by that company in the manufacture of ammonia fertilizers; acetylene is made by the Shawinigan Chemicals and used in making acetic acid, etc., and nitrogen is produced is an intermediate in the manufacture of cyanamide by the North American Cyanamid Company at Niagara Falls.

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