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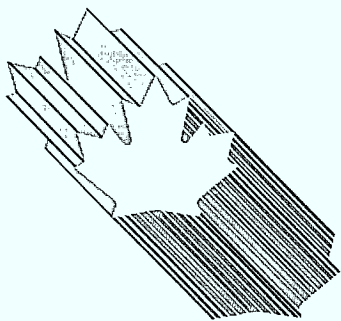


Industry, Science and
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Primary Glass

Canada



I N D U S T R Y

P R O F I L E

PRIMARY GLASS

1988

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FOREWORD

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In a rapidly changing global trade environment, the international competitiveness of Canadian industry is the key to survival and growth. This Industry Profile is one of a series of papers which assess, in a summary form, the current competitiveness of Canada's industrial sectors, taking into account technological and other key factors, and changes anticipated under the Canada-U.S. Free Trade Agreement. Industry participants were consulted in the preparation of the papers.

The series is being published as steps are being taken to create the new Department of Industry, Science and Technology from the consolidation of the Department of Regional Industrial Expansion and the Ministry of State for Science and Technology. It is my intention that the series will be updated on a regular basis and continue to be a product of the new department. I sincerely hope that these profiles will be informative to those interested in Canadian industrial development and serve as a basis for discussion of industrial trends, prospects and strategic directions.

Minister

1. Structure and Performance

Structure

The primary glass industry consists of two sub-sectors: glass containers and unprocessed flat glass. Major users of glass containers are beer, soft drink and food industries, together with distilleries and wineries. Minor users include pharmaceutical and cosmetics industries. Unprocessed flat glass in large sheets is the primary output of flat glass plants. It is used in the manufacture of products such as windows, doors, windshields, furniture and mirrors.

In 1986, total glass container shipments were worth some \$550 million, imports \$40 million and exports \$59 million. The value of unprocessed flat glass shipments was estimated at about \$150 million. Imports, primarily from the United States, were valued at some \$117 million, while exports were considerably lower. The industry employed some 7700 persons.

Glass containers are made by two Canadian companies. Domglas Inc., a subsidiary of C.B. Pak Inc. (80 percent owned by Consolidated Bathurst Inc.), supplies about 60 percent of the market, while Consumers Packaging Inc. supplies the remaining 40 percent. Both firms, either on their own or through associated companies, are also heavily involved in plastics packaging. The two operate a total of 10 glass plants, seven of which are in Ontario and Quebec. The remaining plants are in New Brunswick, Alberta and British Columbia.

Glass container use in Canada is approximately 45 percent for beer and soft drinks, 30 percent for food and juice, 15 percent for spirits and wine and 10 percent for pharmaceuticals, cosmetics and other miscellaneous uses.

For more than 20 years, glass containers have had to contend with stiff competition from plastics, metals and paper composites. While these alternative materials continue to gain market penetration, glass still represents 62 percent of use, versus 33 percent and five percent for metal and plastics respectively. In the United States, on the other hand, the equivalent market share figures are 23 percent for glass, 59 percent for metal and 18 percent for plastics. The replacement of glass by metal containers in the United States may have reached a ceiling. Glass bottles are still very popular in Canada, particularly for beer. Because they can be refilled, they cost less than metal cans, but they do impose distribution limitations. Beer exports, about nine percent of domestic beer shipments, constitute a significant demand for Canadian glass producers. Some beer exports, however, are bottled in imported U.S. containers.

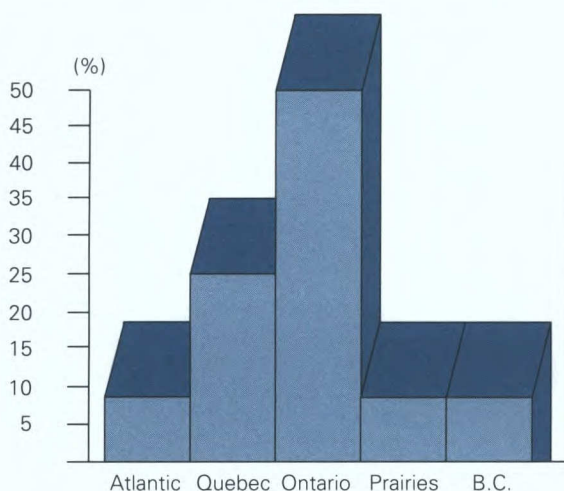
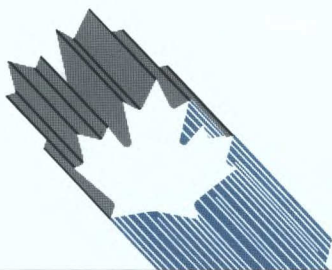
Major raw materials for glass production are sand, soda ash and recycled glass. These mixed materials are melted in furnaces which, in the case of container glass, feed two or more glass-forming machines on a continuous basis. Each machine produces a specific type of container using exchangeable moulds. Plants tend to have high fixed costs and must operate continuously over relatively long periods.

Canada



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Establishments by Region, 1986

Since glass containers are bulky, economical shipping distances are quite short. Firms tend to have a number of plants with capacities geared to local demand. Therefore, competition is based on service and plant location, or lower prices due to large-scale production, rather than different product types.

For many years, Canada has exported glass containers to the United States on the basis of price, quality and customer proximity. Because of high freight costs, imports and exports are relatively small and confined to specific market niches (in terms of geography and/or product types). Canadian glass containers are generally made to higher appearance standards than American ones, a positive factor in securing exports. While trade is largely confined to North America, Canada imports some high-quality perfume bottles from Europe.

Unprocessed flat glass is produced by two Ontario-based subsidiaries of large American corporations — AFG Glass Inc. (AFG) and PPG Canada Inc. (PPG). Both companies operate world-scale float glass plants, each with a single production line. AFG purchased its plant from Ford Glass Inc. in January 1988.

In the western world, four flat glass manufacturers — Pilkington Brothers (United Kingdom), PPG Industries (United States), St. Gobain (France) and Asahi Glass (Japan) — control more than two-thirds of production capacity. In the past decade, concentration of ownership has increased with the absorption of smaller producers.

Modern flat glass is produced using the float glass process, which is employed in more than 100 lines worldwide. The key feature of the float glass process is the flow of molten glass from the furnace onto a bath of molten tin. This results in glass with true parallel surfaces, requiring no grinding or polishing. The process operates continuously, with a relatively fixed level of output, and therefore cannot be adjusted easily to changes in demand. The major production costs (apart from capital) are sand, soda ash, energy and labour.

Most unprocessed flat glass is sold to more than 100 manufacturers who fabricate the glass into semi-finished or finished products. Unprocessed flat glass is used in construction (more than 50 percent), transportation, chiefly automotive (about 33 percent), and the remainder in applications such as mirrors, shelving, furniture, signs and solar panels. Canadian plants produce primarily untinted glass. Tinted glass for automotive and non-residential construction applications, as well as wire glass are imported. In addition to unprocessed flat glass, Canadian flat glass producers also manufacture automotive glass, mirrors, coated glass, insulating (sealed) glass window units and tempered glass.

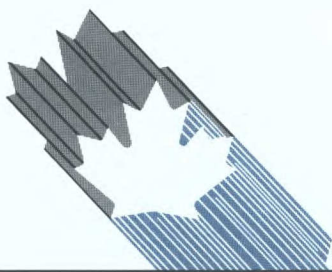
Performance

The shipment value (in current dollars) of primary glass has increased by 29 percent over the past four years. This increase reflects a recovery in shipment volumes from 1982 recession levels, additional real growth and increased prices.

A surge in demand for glass containers began in 1984 when long-neck beer bottles were re-introduced, phasing out the old-style "stubbies". This changeover is now complete. New market niches, such as fruit juices in small single-service bottles, and the increased use of glass as a premium food packaging material, have contributed to rising sales.

The value of the Canadian dollar in relation to its U.S. counterpart has improved the industry's competitive position in the United States. Much of the profit of this mature, capital-intensive industry has been re-invested primarily to improve productivity. Higher outputs have thus been achieved with a relatively constant work force and increased automation.

Canadian demand for unprocessed flat glass has risen significantly since the beginning of the decade, with consumption reaching a new peak in 1987. At the present time, the flat glass industry is operating at near-capacity; plans to expand production are under way.



The flat glass market has always been subject to periodic surges. In the past few years, demand has been stimulated through improved automobile sales and growth of residential, non-residential and home-improvement sectors of the construction industry.

2. Strengths and Weaknesses

Structural Factors

The competitiveness of glass container plants is greatly influenced by the cost of raw materials, the degree of specialization and the size and nature of the market. A cost breakdown would include raw materials, 15 percent; fuel, 10 percent; labour, 35 percent; and capital-related charges, 40 percent.

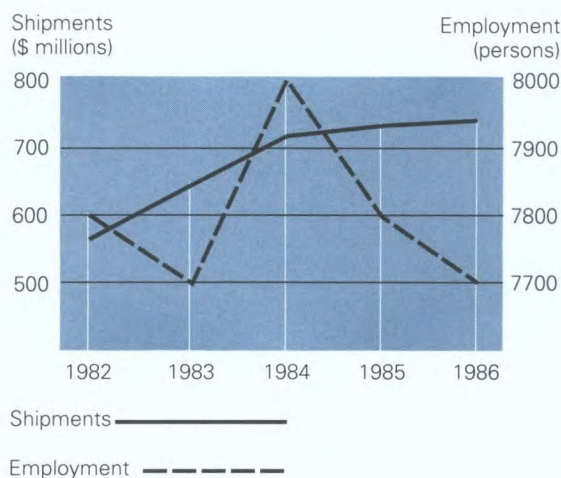
Raw material costs are somewhat higher in Canada than in the United States. This is largely because Canadian synthetic soda ash is priced to equal the landed cost of natural Wyoming material, which includes a 12.5 percent duty. As well, about one-half of the sand has to be imported from the United States at relatively high freight costs for reasons of quality. Recycled glass, some of it from the United States, can make up 25 to 75 percent of the raw materials.

The capacity of glass container-forming machines is adapted to market requirements. Some U.S. plants specialize by confining their operations to a relatively small number of large-volume items. This strategy is possible when plants are located within an economic shipping distance of about 500 km. By using large machines and minimizing mould and glass colour changes, these plants can achieve very high productivity. Some high-capacity U.S. machines can be twice the size of those typical, large Canadian plants and yet the lines operate with a similar number of operators.

Small machines are preferable for short runs because less set-up time is needed for mould changes. Because of the differences in machine capacity, domestic producers are very competitive for low-volume lines, but are vulnerable to price pressure from U.S. producers for high-volume business.

Canadian duty on glass containers (11.4 percent) has been important to the industry as a means of maintaining both market share and profitability. The U.S. duty was eliminated in 1987.

The viability of North American flat glass plants is determined primarily by transportation costs since most plants are of the same size and operate under a similar cost regime. In the United States, flat glass plants are located across the country. In Canada, manufacturing is confined to Ontario and a large portion of the domestic market outside of central Canada is subject to U.S. competition. Offshore competition has also, at times, affected the Canadian market.



Total Shipments and Employment

Trade-related Factors

Canadian duty on glass containers is 11.4 percent, while the U.S. duty was phased out January 1, 1987. For flat glass, Canadian tariffs range from four percent to 5.5 percent (depending on type). Corresponding U.S. duties range from 1.7 to 4.6 percent. The flat glass rate for the European Community (E.C.) is 3.8 to 5.8 percent, while the Japanese tariffs vary from 5.8 to 7.9 percent. The tariff rate for soda ash, the key raw material in glass production, is 12.5 percent.

There are no non-tariff barriers (NTBs) constraining the export or import of glass containers or unprocessed flat glass.

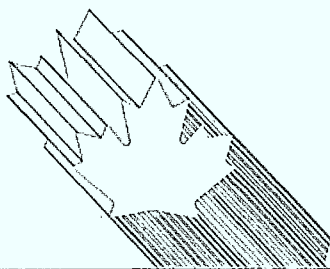
Under the Canada-U.S. Free Trade Agreement (FTA), the duty on glass containers and soda ash will be phased out over 10 years, while the duty on flat glass, over five years.

It is notable that brewery products were exempt from some provisions of the FTA and current practices, such as provincial marketing, will not have to be changed. Changes in liquor board pricing, listing and distribution practices for wine and spirits under the FTA, are not expected to have significant effects on glass containers.

Technological Factors

Canadian glass container companies have access to the latest product and process technology through licensing arrangements with Owens-Illinois, the leading U.S. manufacturer. These arrangements do not restrict markets.

Research to significantly reduce the weight of glass, while increasing its strength, is being done by glass container companies worldwide. Improved glass-forming machines which can produce bottles 20-percent lighter than standard, without loss of strength, already exist. Two such lines are installed in Canada.



Labour productivity has improved through increased automation of furnace operations, container line inspection and bottle packaging. The cost of automation is high — making its introduction gradual, rather than rapid.

Canada's float glass lines are world-scale. Canadian companies have full access to developments of their parent companies, both of whom are world leaders in float glass technology.

Other Factors

Exchange rates have a significant impact on the profitability of Canadian glass container companies. As well, provincial policies have significantly affected competition between glass and metal containers for beer and soft drinks. Provinces have generally favoured refillable glass containers. Glass has remained the cheapest Canadian packaging form. Market penetration of the metal can has remained low (about 12 percent).

In the United States, where large central breweries predominate and shipping distances are long, refillable glass containers are not generally as economical as metal cans. The U.S. industry has almost completely converted to metal cans for beer consumed in the home. This move has been encouraged by widely available aluminum recycling depots.

Exchange rates and ocean transportation rates influence trade in flat glass. Over the years, European and Asian manufacturers have exported various amounts of unprocessed flat glass to Canada and the United States. Currency realignments in recent years have resulted in a marked reduction in Canadian offshore imports.

3. Evolving Environment

Competition with other forms of packaging has affected glass containers for many years. In absolute terms, glass container shipments are expected to increase at a modest rate of between one to two percent per year. As a percentage of the total packaging materials market, glass containers will continue to lose ground to plastics, metal and composite forms of packaging. This trend may, however, be slowed by lighter-weight bottles and the development of new market niches.

Over the past 20 years, the demand for unprocessed flat glass in North America has doubled at an average annual growth rate of 3.5 percent. Expansion in the home-improvement construction market has made up a large part of this increase. More unprocessed glass is being used in the production of value-added products such as insulating window units, skylights and glass with low emission. Demand for unprocessed automotive flat glass is also expected to rise, due to the trend towards assembly of foreign cars in Canada and the United States. This increased demand may result in additional manufacturing capacity in Canada in the near future.

American competition in Canada is likely to increase as a result of the phasing out of import duties under the FTA. The U.S. glass container industry has become highly rationalized in recent years with the emergence of two giant glass container companies resulting from mergers and buy-outs. These giants, Owens-Illinois and Anchor, together control nearly two-thirds of the U.S. market, and can be expected to increase pricing pressures on high-volume lines in Canada.

There is also growing international pressure for improved access to the Canadian alcoholic beverage market, with potential implications for the glass container industry.

A General Agreement on Tariffs and Trade (GATT) Panel Report, found Canada's practices relating to the listing, pricing and distribution of alcoholic beverages to be inconsistent with international trading rules. Canada had until the end of 1988 to formally report back on steps taken to address this inconsistency.

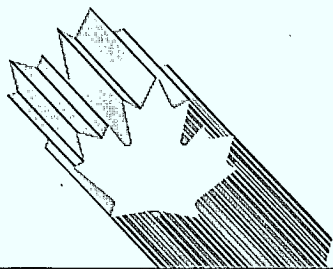
While a Committee of Intergovernmental Ministers on Internal Trade is currently discussing the liberalization of interprovincial trade in alcoholic beverages, Canada has already indicated to GATT that it is not prepared to take any action to change its beer marketing practices in the near future.

Over the longer run, a more open trading environment regarding beer is a possibility. This would require adjustment by the glass container industry, and most likely would involve installing larger, more productive glass-forming machines and increasing rationalization of product lines among plants. A November 1988 announcement gave notice that, subject to government approval, the two glass container companies operating in Canada propose to merge. This, clearly, would lead to industry rationalization.

The FTA will have little effect on the outlook for the Canadian unprocessed flat glass industry, since it is already closely integrated with its American counterpart.

4. Competitiveness Assessment

Canada's glass container industry, while generally competitive in today's environment, would be somewhat less competitive in a less regulated trade environment. Marketplace changes could take place, and would require some adjustment by the industry.

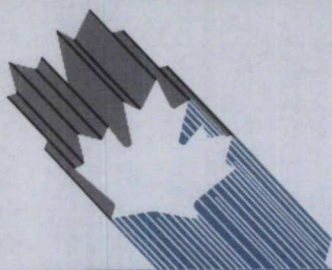


Canadian flat glass manufacturers operate two world-scale plants, which are as efficient as their U.S. counterparts. However, because the Canadian industry is concentrated entirely in Ontario, much of the country is vulnerable to U.S. and offshore imports. The effect of the FTA on the flat glass sub-sector, which is already integrated on a North American basis, should be neutral.

For further information concerning the subject matter contained in this profile, contact:

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PRINCIPAL STATISTICS

SIC(s) COVERED: 3561 (1980)

	1973	1982	1983	1984	1985	1986
Establishments	11	11	11	12	12	12
Employment ('000)	7400	7800	7700	8000	7800	7700
Shipments (\$ millions) ¹	229	572	644	718	731	737

TRADE STATISTICS

	1973	1982	1983	1984	1985	1986
Exports (\$ millions) ²	4	62	55	56	56	59
Imports (\$ millions) ^e	62	101	130	163	162	157
Source of imports ^e (% of total value)			U.S.	E.C.	Japan	Others
	1982	87.7	6.2	2.8	3.3	
	1983	86.9	7.1	2.7	3.3	
	1984	86.8	7.3	2.3	3.6	
	1985	85.1	9.3	1.8	3.8	
	1986	82.9	10.7	1.7	4.7	
Destination of exports ² (% of total value)			U.S.	E.C.	Japan	Others
	1982	93.7	0.3	0.1	5.9	
	1983	92.9	0.3	—	6.8	
	1984	91.2	0.9	—	7.9	
	1985	96.5	0.5	—	3.0	
	1986	94.9	0.7	—	4.4	

REGIONAL DISTRIBUTION — Average for 1986

	Atlantic	Quebec	Ontario	Prairies	B.C.
Establishments — % of total	8.3	25	50	8.3	8.3

MAJOR FIRMS

Name	Ownership	Location of Major Plants
Domglas Inc.	Canadian	Montréal, Quebec, Scoudouc, New Brunswick; Brampton and Hamilton, Ontario; Redcliff, Alberta
Consumers Packaging Inc.	Canadian	Candiac and St-Pierre, Quebec Toronto and Milton, Ontario Lavington, British Columbia
AFG Glass Inc.	American	Scarborough, Ontario
PPG Canada Inc.	American	Owen Sound, Ontario

1 Some further processed glass included in shipment figures
 2 Glass container only; flat glass statistics unavailable
 e ISTC estimate

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