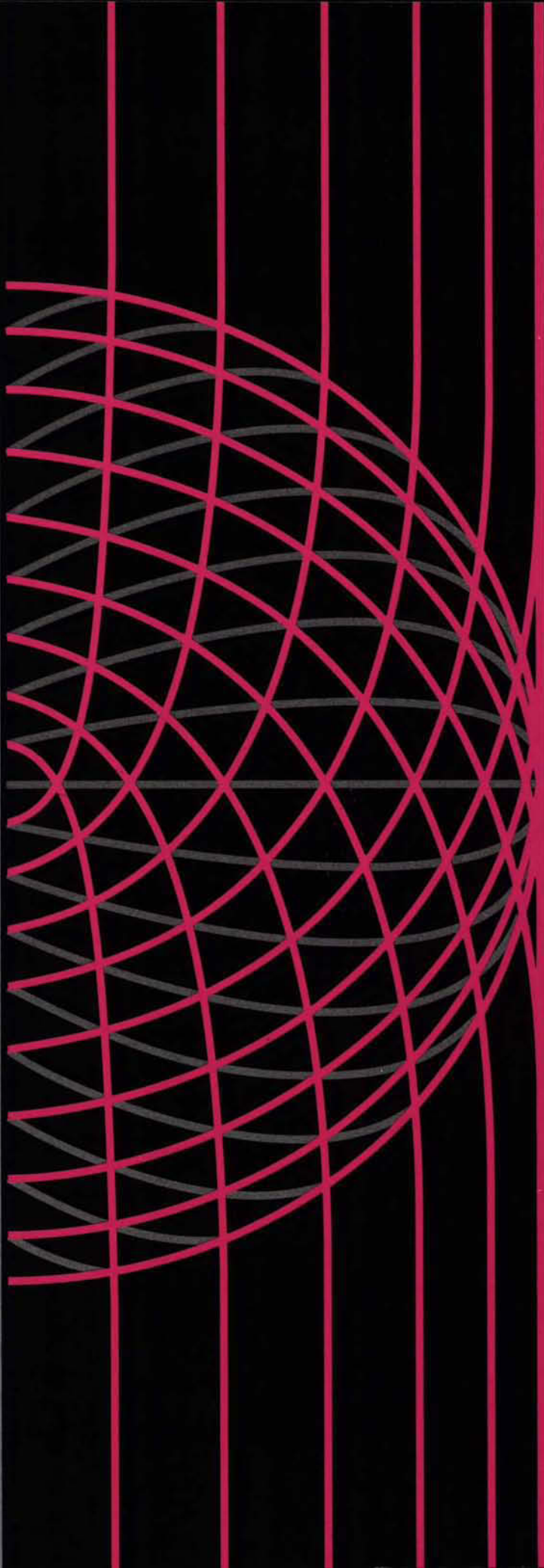


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Canada

1990-1991

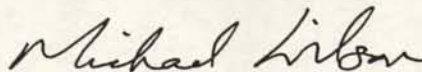
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BIBLIOTHÈQUE
INDUSTRIE, SCIENCES ET
TECHNOLOGIE CANADA**FOREWORD**

In a rapidly changing global trade environment, the international competitiveness of Canadian industry is the key to growth and prosperity. Promoting improved performance by Canadian firms in the global marketplace is a central element of the mandates of Industry, Science and Technology Canada and International Trade Canada. This Industry Profile is one of a series of papers in which Industry, Science and Technology Canada assesses, in a summary form, the current competitiveness of Canada's industrial sectors, taking into account technological, human resource and other critical factors. Industry, Science and Technology Canada and International Trade Canada assess the most recent changes in access to markets, including the implications of the Canada-U.S. Free Trade Agreement. Industry participants were consulted in the preparation of the profiles.

Ensuring that Canada remains prosperous over the next decade and into the next century is a challenge that affects us all. These profiles are intended to be informative and to serve as a basis for discussion of industrial prospects, strategic directions and the need for new approaches. This 1990-1991 series represents an updating and revision of the series published in 1988-1989. The Government will continue to update the series on a regular basis.



Michael H. Wilson
Minister of Industry, Science and Technology
and Minister for International Trade

Structure and Performance**Structure**

The primary glass industry comprises the makers of glass containers and unprocessed flat glass.

Glass containers include bottles and jars, most of which are made for the food and beverage industries. They are made from silica sand, natural soda ash limestone and recycled glass, which are mixed and melted in furnaces and then continuously fed into two or more glass-forming machines. Using an exchangeable mould, each machine produces a specific type of container. The containers may be clear or coloured. They are impermeable and can be hot-filled, retorted, microwaved, refilled and recycled.

Most flat glass is manufactured using the modern float glass process, which is employed in more than 100 production lines throughout the world. In this process, molten glass flows from the furnace onto a bath of molten tin. It hardens into a flat glass sheet with true parallel surfaces that require no grinding or polishing.

In 1989, the value of glass container shipments amounted to \$480 million, of which exports accounted for \$68 million. Imports were worth \$67 million. The value of unprocessed flat glass shipments was estimated at \$150 million. Exports were valued at \$18 million and imports at \$160 million (see Figure 1 for total values).¹ Nearly 6 000 people are employed in the primary glass industry.

In Canada, approximately 49 percent of glass containers are used to hold beer and soft drinks, 35 percent for food

¹Subsector shipments, exports and imports are based on industry data that do not precisely match the aggregate numbers supplied by Statistics Canada.

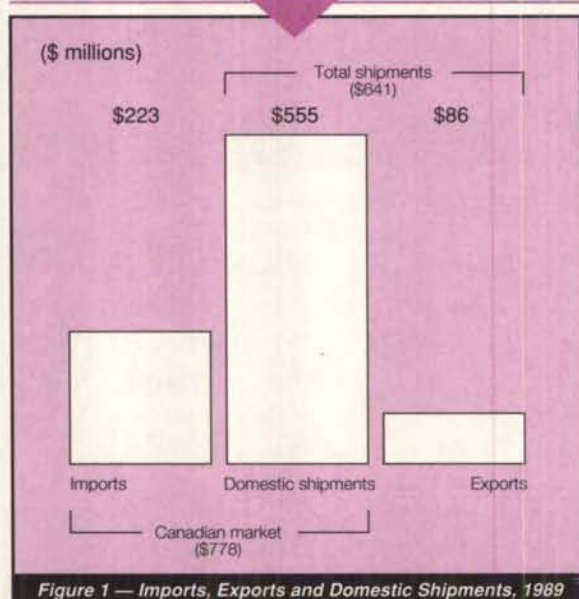


Figure 1 — Imports, Exports and Domestic Shipments, 1989

and juice, 12 percent for spirits and wine, and 4 percent for pharmaceutical, cosmetics and other miscellaneous uses. As a comparison, in 1990, the use of glass containers in the United States was 33 percent for food products, 31 percent for beer, 22 percent for beverages, 9 percent for other alcoholic beverages and 5 percent for general packaging.

Glass containers are made in Canada by only two Canadian companies: Consumers Packaging, which purchased the assets of Domglas in May 1989, and Libbey St. Clair, owned by private U.S. investors. Consumers Packaging also manufactures plastic packaging, and Libbey St. Clair makes glass tableware. The two companies operate a total of nine glass-container plants, five of which are in Ontario, two in Quebec and one each in British Columbia and New Brunswick. Since glass containers are generally bulky, the economical shipping distance is limited to about 500 kilometres. Firms tend to have plants with capacities geared to local demand.

Canadian manufacturers export glass containers to the United States on the basis of price, quality and customer proximity. Because of high freight costs, exports (17 percent of shipments in 1989) and imports (20 percent of Canadian consumption in 1989) are confined to specific market niches. While trade is largely confined to the United States, Canada also imports glass containers from Brazil, Mexico and Turkey as well as some high-quality perfume bottles from Europe.

Over one-half of unprocessed flat glass is used in construction, about one-third in transportation (chiefly automotive) and the remainder in applications such as shelving, mirrors,

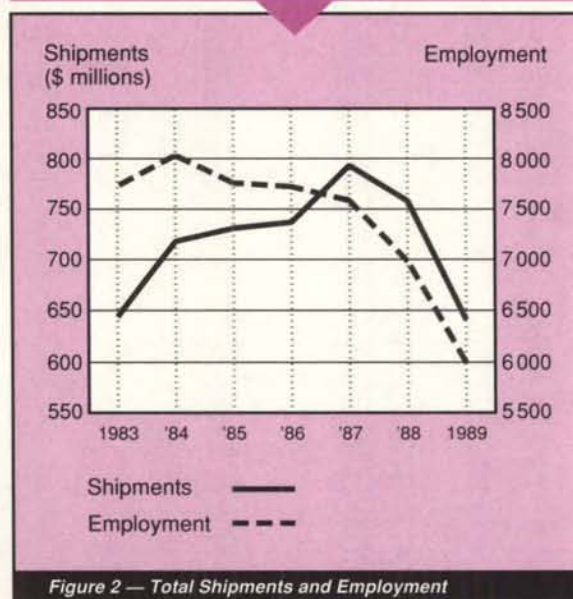


Figure 2 — Total Shipments and Employment

furniture, signs and solar panels. Most unprocessed flat glass is sold to more than 100 secondary manufacturers, who fabricate semifinished or finished glass products. Canadian flat glass producers manufacture automotive glass, mirrors, coated glass, insulating (sealed) glass window units and tempered glass. Canadian plants primarily produce untinted glass. Tinted glass for automotive and non-residential construction applications, as well as wired glass, is imported.

More than two-thirds of production capacity of flat glass in Western economies is controlled by four manufacturers: Pilkington of the United Kingdom, PPG Industries of the United States, Saint Gobain of France and Asahi Glass of Japan. Over the past decade, concentration of ownership has increased with their acquisition of smaller producers.

In Canada, there are three domestic unprocessed flat glass manufacturers, which are subsidiaries of large international glass companies. Two of the companies, AFG Glass and PPG Canada, are Ontario-based subsidiaries of U.S. glass producers. The third manufacturer, Glaverbec, is controlled by a Belgian company, Glaverbel S.A., which in turn is controlled by Asahi Glass of Japan. The Glaverbec flat glass facility in Quebec opened in late 1990. The three Canadian companies operate world-scale glass plants of approximately the same size, each with a single operating production line.

Performance

Figure 2 portrays the overall performance of the Canadian primary glass industry in recent years.



The glass containers subsector is mature and capital-intensive. The development of new market niches, such as fruit juices in small single-serving bottles, and the increased use of glass as a perceived "premium" food packaging material serve to maintain the glass container share of the packaging market.

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 containers for beverages still account for a significant portion of the rigid container market (see table). The U.S. market share figures reflect U.S. consumer preference for beer in cans. Although Canadian beer in long-necked bottles is still very popular in both the domestic and export markets, consumption of beer in glass containers has declined, especially in British Columbia, as consumers have switched to lower-priced U.S. beer in cans. Returnable glass beer bottles are still very popular in Ontario and are refillable 17 times on average. They cost less than metal cans over their life span, but they do impose distribution and recycling collection costs. Nine percent of Canadian beer shipments are exported, representing a significant market for glass producers. Some beer exports, however, are bottled in containers imported from the United States.

The glass container industry's profits have declined since 1988. Losses amounted to \$6 million in 1988, \$12 million in 1989 and \$31 million in 1990.

Between 1987 and 1989, the Canadian flat glass industry experienced its best years ever. Demand for unprocessed flat glass has undergone a serious slump since the beginning of 1990, however, which reflects a downturn in construction activity and a weak market for automobiles. Competition

among unprocessed flat glass producers is fierce, and prices at the beginning of 1991 were below 1985 levels.

Strengths and Weaknesses

Structural Factors

The competitiveness of glass container plants is greatly influenced by the cost of raw materials and other inputs, the degree of specialization and the size and nature of the market.

The cost of raw materials used in making glass containers is low relative to that associated with other packaging materials. For example, direct materials represent only 28 percent of the production cost of glass containers compared with 70 to 75 percent for metal cans and 60 percent for plastic containers.

However, glass containers have a distinct disadvantage with regard to labour input, which constitutes 35 percent of the production cost, compared with 9 to 14 percent for metal cans and 13 percent for plastic containers. The fragility of glass and the greater number of steps in producing it makes this industry more labour-intensive than counterparts making containers of other materials.

Raw material costs are somewhat higher in Canada than in the United States. Canadian synthetic soda ash is priced to equal the landed cost of natural soda from Wyoming, including duty. Silica sand is available in Canada; however, higher-quality sand, amounting to one-half of the total used in Canada, has to be imported from the United States at relatively high freight costs. Recycled glass can make up to 35 percent of the raw materials used in containers.

Glass container plants have high fixed costs and must operate continuously over relatively long periods to be economical. Nevertheless, the capacity of glass-container-forming machines can be adapted to market requirements. In the United States, some plants specialize in a small number of large-volume items, thereby minimizing mould and glass colour changes, and use high-capacity machines to achieve very high productivity. In Canada, small machines are preferable for the shorter runs required to produce a variety of products because they require less set-up time for mould changes. Canadian producers are competitive for low-volume lines, but are vulnerable to U.S. producers for high-volume business.

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 structure. They operate continuously at a relatively fixed level of output and therefore cannot easily adjust to changes in demand.

Market Share of Rigid Packaging for Beverages, 1990 (%)

	Soft drinks		Beer	
	Canada	U.S.	Canada	U.S.
Glass	29	15	80	28
• refillable	15	1	80	1.4 ^a
• non-refillable	14	14	—	26.6 ^a
Metal	41	71	20	72
Plastic	30	14	—	—
Total	100	100	100	100

^a ISTC estimates.

Sources: Brewers' Association of Canada and Canadian Soft Drink Association for Canadian data and *Beverage World* for U.S. data.



Apart from plant and equipment, the major production costs are sand, soda ash, energy and labour. In the United States, plants are located across the country. In Canada, however, manufacturing is confined to Ontario and Quebec. Therefore, a large portion of the domestic market outside Central Canada is particularly subject to competition from states near the Canada-U.S. border.

Trade-Related Factors

Canadian tariffs levied on flat glass imported from countries having Most Favoured Nation (MFN) status range from 4 to 5.5 percent. The comparable tariffs assessed by the European Community (EC) on flat glass are 3.8 to 5.8 percent, while Japan's MFN rates on flat glass vary from 3.2 to 7.9 percent. The Canadian MFN tariff on glass containers is 11.4 percent.

Under the Canada-U.S. Free Trade Agreement (FTA), implemented on 1 January 1989, the Canadian duties on glass containers and soda ash imported from the United States are being eliminated in 10 annual, equal stages and will reach zero on 1 January 1998. In 1991, the duty on U.S.-made glass containers was reduced to 7.9 percent. The U.S. duty on glass containers imported from Canada had previously been eliminated on 1 January 1987. On the other hand, Canadian and U.S. duties on unprocessed flat glass were given an accelerated phase-out and were eliminated on 1 July 1991.

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

Technological Factors

Innovations in the glass container subsector of the industry worldwide have focused on significantly reducing weight while increasing the strength of the material. In Europe, the "press and blow" technique has resulted in the creation of light-weight containers with equal resistance at all points. This technique has been adopted in Canada. In addition, two improved glass-forming machine lines in Canada can now produce bottles that are 20 percent lighter than standard ones without loss of strength. Other technological advances in products include glass bottles with plastic sleeves, wide-mouthed and prelabelled bottles and jars sealed with composite lids.

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

Canada's leading glass container company, Consumers Packaging, has access to the latest product and process technology through a licensing arrangement with Owens Brockway

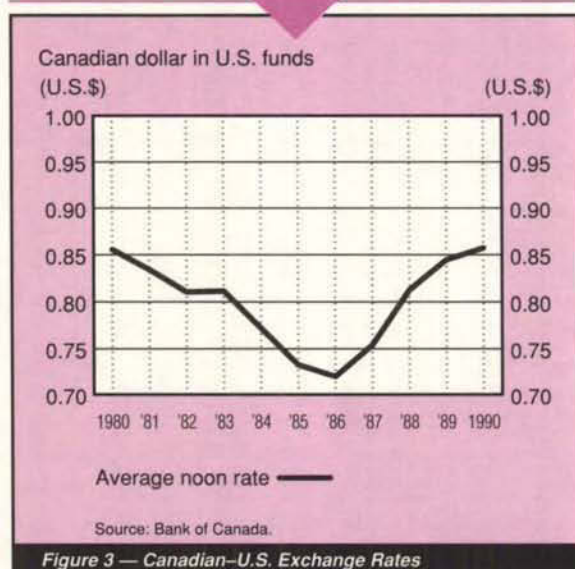


Figure 3 — Canadian-U.S. Exchange Rates

Glass Container, a division of Owens Illinois, the leading U.S. container manufacturer. This licensing contract does not restrict entry to foreign markets.

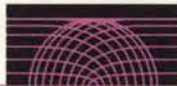
Canada's float glass lines are world-scale. Canadian companies have full access to developments of their parent companies, which are world leaders in float glass technology.

Other Factors

The industry has expressed concern about the relatively higher value of the Canadian dollar in recent periods vis-à-vis the American dollar (Figure 3). On the other hand, under certain economic conditions, it is widely recognized that a significantly lower value is likely to be inflationary. The resulting higher domestic costs and prices can erode, over time, the short-term competitive gains of such a lower-valued dollar.

Provincial environmental policies have significantly influenced competition between glass and metal containers for beer and soft drinks. Some provinces have favoured refillable glass containers. Ontario has stipulated that the soft drink industry must sell at least 30 percent of its product in refillable units, effective 1 April 1991. In addition, the government of Ontario has ordered its Liquor Control Board to make refillable wine and liquor bottles a priority. At the time of writing, this matter is under study.

Glass containers may also be affected by legislation arising from the federal-provincial National Packaging Protocol, established by the Canadian Council of Ministers of the Environment. The National Packaging Protocol includes a commitment for a 50 percent reduction in packaging waste by the year 2000, using 1988 as the designated base year.



It favours the use of recyclable containers, which not only reduce solid waste, but also limit demand for new materials and energy.

The glass container industry is endeavouring to achieve this goal. As a first step, it has identified the advantages of using recycled glass over other recycled container materials. Glass is one of the few packaging materials that offers a choice between reusable and non-reusable bottles: both are recyclable. In recycling, one tonne of recycled glass replaces 1.2 tonnes of raw material. Moreover, one tonne of recycled glass uses 20 percent less energy, on average, to produce glass containers than is required for making new glass. In 1989, over 180 000 tonnes of consumer glass waste was recycled, which represents a saving of 25 percent of the amount of new glass that would otherwise have been required.

High ocean transportation costs hinder trade in flat glass. Over the years, European and Asian manufacturers have exported limited amounts of unprocessed flat glass to Canada and the United States. Currency realignments have resulted in a marked reduction in Canadian imports from offshore.

Environmental regulations administered by the provinces also affect the flat glass industry. The major emphasis is on the control of air emissions such as sulphur dioxide and nitrous oxide.

Evolving Environment

At the time of writing, the Canadian and U.S. economies were showing signs of recovering from a recessionary period. During the recession, companies in the industry generally experienced reduced demand for their products, in addition to longer-term underlying pressures to adjust. In some cases, the cyclical pressures may have accelerated adjustments and restructuring. With the signs of recovery, though still uneven, the medium-term outlook will correspondingly improve. The overall impact on the industry will depend on the pace of the recovery.

In absolute terms, glass container shipments are expected to increase at a modest rate of between 1 and 2 percent per year. As a share of the total packaging materials market, however, glass containers will continue to lose ground to plastics, metal and composite forms of packaging. This trend may be slowed by lighter-weight bottles, the development of new market niches and consumer awareness of the importance of recyclable, environmentally friendly packaging.

Competition from U.S.-made glass containers 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 as a result of mergers and buy outs. These giants, Owens Illinois and Anchor Glass Container, control nearly two-thirds of the U.S. market and can be expected to increase pricing pressures on high-volume glass products in Canada. These alternative suppliers may become increasingly attractive sources to Canadian customers.

Growing international pressure for improved access to the Canadian alcoholic beverage market is likely to reduce the Canadian requirement for glass containers for these products. A panel review under the General Agreement on Tariffs and Trade (GATT) requested by the EC reported excessive Canadian restrictions on listing, pricing and distributing alcoholic beverages. As a result, Canada in 1989 undertook to bring its practices regarding wine and distilled spirits into line with international trading rules and to allow greater imports of products bottled abroad. Negotiations with the EC regarding the listing and pricing of beer are continuing. Another GATT panel investigated U.S. complaints regarding provincial restrictions on beer canned in the United States. Reciprocally, Canada is challenging U.S. federal and state practices that inhibit Canadian beer exports. Meanwhile, Canadian federal and provincial governments are continuing discussions to liberalize interprovincial trade in beer in an effort to boost the competitiveness of the beer industry in the face of the international challenges.

Demand for unprocessed flat glass, while subject to cyclical fluctuations in the construction and automotive sectors, is forecast to grow by approximately 3 percent annually over the long term. In the home renovation market, an important contributing factor is the increased use of unprocessed flat glass in the production of value-added products such as insulated (sealed) glass window units, skylights, solariums and coated glasses. In addition, North American demand for flat glass is expected to rise in the automotive sector due to the ongoing trend towards assembling foreign cars in Canada and the United States. The FTA will have little effect on the Canadian unprocessed flat glass industry, since the Canadian industry is already closely integrated with its U.S. counterpart.

Competitiveness Assessment

Canada's glass container industry has met the needs of the Canadian market, but its scale of operation has not been on a par with that of its large, efficient U.S. competitors. Over the past two years, however, the Canadian industry has made significant progress in improving cost structures and introducing new production processes. It has also invested heavily in equipment to meet the challenge from competing high-volume, mass-produced products.



As tariff rates decline, transportation costs and customer service will be the chief factors that help maintain the Canadian industry's position in the North American glass container market.

Canadian flat glass manufacturers operate three world-scale plants, which are as efficient as their U.S. counterparts. However, their location in Central Canada leaves much of the rest of the country open to competition from U.S. and offshore imports. The effect of the FTA on the unprocessed flat glass industry, which is already integrated on a North American basis, is neutral.

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PRINCIPAL STATISTICS^a

	1983	1984	1985	1986	1987	1988	1989
Plants	14	14	13	13	13	13	11 ^b
Employment	7 727	8 031	7 758	7 722	7 584	6 981	5 995
Shipments ^c (\$ millions)	644	718	731	737	793	758	641

^aSee *Non-Metallic Mineral Products Industries*, Statistics Canada Catalogue No. 44-250, annual (SIC 3561, primary glass and glass containers industry).

^bISTC estimate.

^cSome further processed glass is included in the shipments data.

TRADE STATISTICS

	1983	1984	1985	1986	1987	1988 ^a	1989 ^a
Exports ^b (\$ millions)	55	56	56	59	56	71	86
Domestic shipments (\$ millions)	589	662	675	678	737	687	555
Imports ^c (\$ millions)	130	163	162	157	184	216	223
Canadian market (\$ millions)	719	825	837	835	921	903	778
Exports (% of shipments)	8.5	7.8	7.7	8.0	7.1	9.4	13.4
Imports (% of Canadian market)	18.1	19.8	19.4	18.8	20.0	23.9	28.7

^aIt is important to note that data for 1988 and after are based on the Harmonized Commodity Description and Coding System (HS). Prior to 1988, the shipments, exports and imports data were classified using the Industrial Commodity Classification (ICC), the Export Commodity Classification (XCC) and the Canadian International Trade Classification (CITC), respectively. Although the data are shown as a continuous historical series, users are reminded that HS and previous classifications are not fully compatible. Therefore, changes in the levels for 1988 and after reflect not only changes in shipment, export and import trends, but also changes in the classification systems. It is impossible to assess with any degree of precision the respective contribution of each of these two factors to the total reported changes in these levels.

^bSee *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly.

^cSee *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.

SOURCES OF IMPORTS^a (% of total value)

	1983	1984	1985	1986	1987	1988	1989
United States	86.9	86.8	85.1	82.9	87.0	87.0	90.1
European Community	7.1	7.3	9.3	10.7	7.6	7.6	6.1
Japan	2.7	2.3	1.8	1.7	3.1	1.8	0.4
Other	3.3	3.6	3.8	4.7	2.3	3.6	3.4

^aSee *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.



DESTINATIONS OF EXPORTS^a (% of total value)

	1983 ^b	1984 ^b	1985 ^b	1986 ^b	1987 ^b	1988	1989
United States	92.9	91.2	96.5	94.9	93.6	72.9	81.9
European Community	0.3	0.9	0.5	0.7	5.9	18.5	12.4
Japan	—	—	—	—	—	—	—
Other	6.8	7.9	3.0	4.4	0.5	8.6	5.7

^aSee *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly.

^bData prior to 1988 include glass containers only, as data on flat glass are not available.

REGIONAL DISTRIBUTION^a (1989)

	Atlantic	Quebec	Ontario	Prairies	British Columbia
Plants (% of total)	10	20	60	—	10

^aSee *Non-Metallic Mineral Products Industries*, Statistics Canada Catalogue No. 44-250, annual.

MAJOR FIRMS

Name	Country of ownership	Location of major plants
AFG Glass Inc.	United States	Scarborough, Ontario
Consumers Packaging Inc.	Canada	Scoudouc, New Brunswick Montreal, Quebec Candiac, Quebec Etobicoke, Ontario Hamilton, Ontario Milton, Ontario Bramalea, Ontario Lavington, British Columbia
Glaverbec Inc.	Belgium	Saint-Augustin-de-Desmaures, Quebec
Libbey St. Clair Limited	United States	Wallaceburg, Ontario
PPG Canada Inc.	United States	Owen Sound, Ontario

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