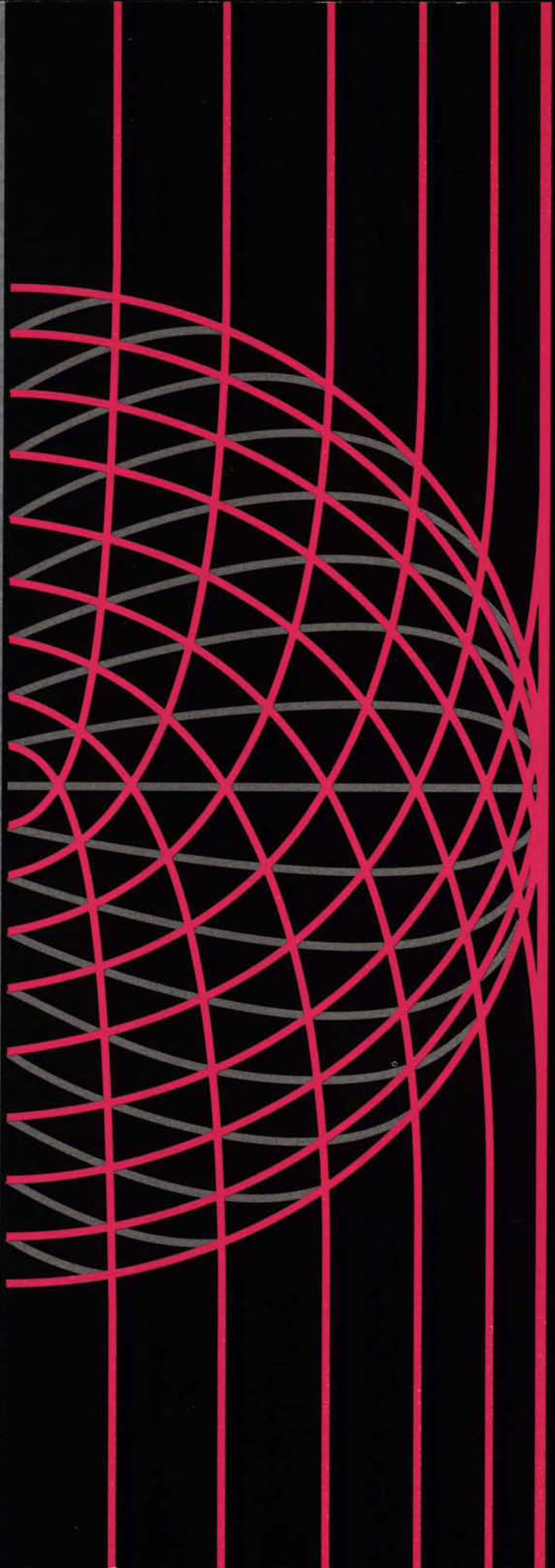
Adhesives and Sealants

INDUSTRY PROFILE



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Canada

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I N D U S T R Y P R O F

1990–1991

ADHESIVES AND SEALANTS

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

Adhesives are substances capable of forming and maintaining a bond between two surfaces, and sealants are substances used to fill gaps or joints between two materials to prevent the passage of liquids, solids or gases. The traditional terms *glues* and *caulks* are often used, typically to refer to low-performance products.

Adhesives and sealants are formulated by compounding (mixing) the base material with fillers, pigments, stabilizers, plasticizers and other additives to yield a product with the desired end-use characteristics at an acceptable cost. Low- to medium-performance products are based on natural substances (e.g., starch, dextrin, natural rubber or protein) or synthetic polymers such as polyvinyl acetate, polyvinyl alcohol, polyesters, acrylics, neoprene, butyl rubber, phenolics or thermoplastic elastomers. High-performance products have enhanced properties including bond strength, elongation capacity, durability or environmental resistance. These products, based on such polymers as epoxy, polyamide, polysulfide, polyurethane, cyanoacrylate and silicone, are mostly imported, because current Canadian demand is not high enough to justify domestic manufacture. High-performance products represented about 40 percent of the total value of U.S. shipments in 1989; no figures are available for their share of Canadian shipments.

The adhesive and sealant industry in Canada comprises about 60 companies that list the manufacture and sale of adhesives or sealants as their principal business. This industry employed 1 900 people and had shipments of $340 million in 1989 (Figure 1). Sealants account for more than 30 percent of Canadian shipments, compared with about 20 percent in the United States. This difference is due to a greater emphasis in Canada on air sealing of buildings as an energy conservation measure.

Detailed statistics are available for the adhesives subsector, but not for sealants. In 1988, Statistics Canada reported

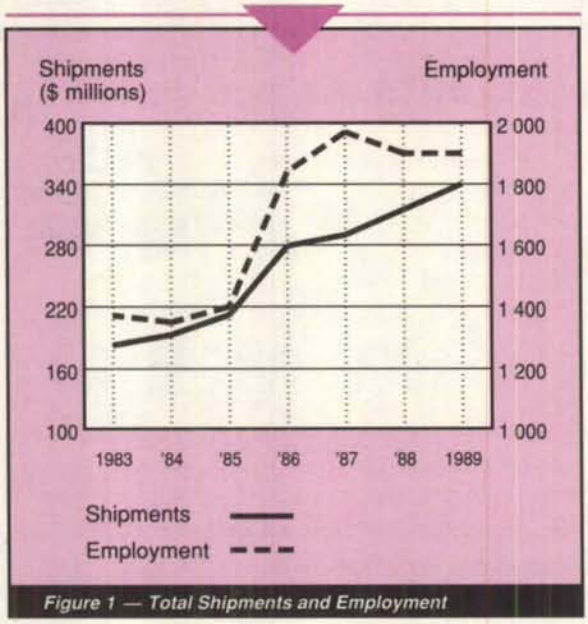

Figure 1 — Total Shipments and Employment

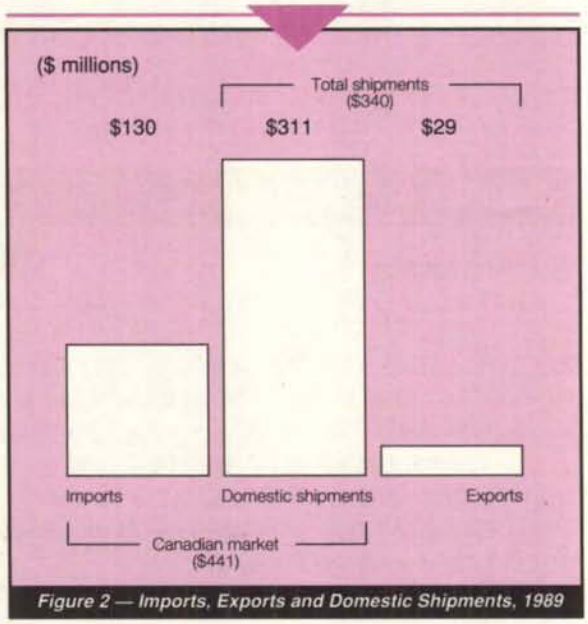

Figure 2 — Imports, Exports and Domestic Shipments, 1989

44 adhesive-manufacturing establishments: 28 were located in Ontario; eight in Quebec; two in each of New Brunswick, Alberta and British Columbia; one in Nova Scotia; and one in Manitoba. The concentration of the industry in Ontario becomes even more pronounced when it is considered that this province accounted for about 80 percent of both total industry shipments and total employment. That concentration is explained by the fact that companies tend to locate near their largest markets so that they can provide better service and reduce transportation costs.

Adhesives and sealants can be classified according to their two major markets — industrial and consumer. The industrial segment is estimated to account for about 80 percent of the Canadian market. Nearly all manufacturers produce a wide range of products, which are consumed in the major end-use markets. Major users of adhesives are the packaging, automotive, construction and furniture industries. Sealants are used primarily by the construction, electronics and automotive industries. A large and growing element of the consumer market is aimed at the "do-it-yourselfer" engaged in building maintenance and renovation.

The Canadian industry is primarily oriented toward supplying the Canadian market. In 1989, exports were valued at $29 million, representing 9 percent of shipments, with sealants accounting for 41 percent of the total (Figure 2). Of these exports, 81 percent went to the United States. Imports were valued at $130 million in 1989, representing 29 percent of the Canadian market, with sealants accounting for 48 percent of the total. Eighty-nine percent of imports came from the United States.

Industry, Science and Technology Canada (ISTC) estimates that foreign-owned subsidiaries produce 70 percent of shipments and represent about two-thirds of the firms. While over half of these subsidiaries export, most export only a small proportion of their total production.

Performance

Between 1975 and 1981, the value of adhesive and sealant shipments grew at an average real annual rate of 4.3 percent. Most of this growth occurred in the sealant segment of the industry, spurred by government initiatives to improve the energy efficiency of Canadian buildings. Shipments decreased 11 percent during the 1981–1982 recession but recovered quickly with 29 percent growth in 1983. Between 1984 and 1989, the average real annual growth rate was 6.7 percent. Growth is uneven because a large portion of total output is consumed by the construction, automotive and furniture industries, all of which are subject to strong business cycles. The growth in shipments between 1984 and 1989 reflects the overall strength of the economy during that period.

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 outputs, 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.

Between 1984 and 1989, the number of establishments remained nearly constant, but employment increased substantially. The industry remains labour-intensive in nature.

Strengths and Weaknesses

Structural Factors

The key factors influencing competitiveness in the adhesive and sealant sector are scale of operation, cost of raw materials and labour, proximity to markets, cost of technical services, import duties, the relative level of technology and regulatory compliance demands.

In Canada, manufacturing facilities tend to be small, batch operations. Even in the United States, only the largest plants operate continuous processes. Many Canadian plants produce a wide array of products to try to serve the spectrum of the Canadian market. U.S. plants are more likely to specialize to maximize the benefits of higher-volume operation. The current practices make it hard for Canadian firms to be price-competitive with U.S. producers.

Many Canadian plants are operating below capacity. While there have been a few expansions and some new plants constructed in the past 10 years, in general, plant equipment is quite old and capital investment has been limited. Investment may soon be needed to improve the efficiency and quality control in these plants.

Raw materials and packaging account for about 76 percent of manufacturing costs. Raw material costs are higher for Canadian manufacturers than for their U.S. competitors for two reasons. Many of these materials originate in the United States and are currently subject to import duties, although these will be eliminated by 1993. Moreover, Canadian manufacturers purchase smaller volumes, resulting in a higher per unit price.

Salaries and wages account for about 22 percent of manufacturing costs. Labour rates are generally slightly higher in Canada than in the United States. Overall energy costs are lower in Canada, but the effect on competitiveness is negligible for this industry since energy represents only a minor component (about 2 percent) of overall costs.

Transportation costs can be significant over long distances. They afford an element of protection from outside competitors to manufacturers of lower-value goods within their regional markets. Reciprocally, they also present a barrier to achieving increased sales outside the region. High-performance products, on the other hand, command a higher price, which can support travel over greater distances. Therefore, all Canadian manufacturers of these premium-priced products can expect increased competition from U.S. producers. Canadian manufacturers will have to expand their foreign markets in order to retain or increase production levels. Increased sales of these high-performance materials will offer the greatest opportunity to develop new international markets.

Manufacturers must provide a high degree of technical service and must be able to respond rapidly to new demands. Increasingly, manufacturers must custom-design adhesives and, to a lesser extent, sealants to meet the specific requirements of the user. This need increases the importance of establishing and maintaining strong manufacturer/user relationships. In this type of relationship, customer loyalty is based primarily on a consistent record of effective, timely service from the manufacturer, rather than solely on price considerations. Although this loyalty is expensive to sustain, it may protect Canadian companies from increased foreign competition.

Trade-Related Factors

Canadian tariffs have offset some of the cost advantages that U.S. firms have been able to achieve because of their larger production runs. Under the Canada-U.S. Free Trade Agreement (FTA), Canadian and U.S. tariffs on adhesives and sealants as well as on most raw material inputs will be eliminated through annual reductions in five equal steps ending 1 January 1993. This will lead to lower input costs for Canadian manufacturers, and will provide more attractive export opportunities. At the same time, the Canadian market will become more attractive to U.S. producers.

In the more competitive environment of the 1990s, Canadian companies may need to specialize in order to achieve longer production runs. They may also need to add more high-technology products (with accompanying higher margins) to their product lines. Both these strategies will be easier to undertake if the companies can expand their markets beyond Canada's borders.

As of 1 January 1991, the tariff on qualifying products imported into Canada from the United States under the FTA is 4.1 percent for rubber cement and 5.0 percent for other adhesives and sealants. Effective the same date, the tariffs on qualifying products entering the United States from Canada range from 0.8 to 2.4 percent for adhesives and from zero to 4.4 percent for sealants. In addition, there is a specific duty ranging from 1.0 to 1.8 cents per kilogram for certain types of adhesives.

For other countries exporting products to Canada, the Most Favoured Nation (MFN) tariff rate is 10.3 percent for rubber cement and 12.5 percent for other adhesives and sealants. For Canadian exports, the tariff rates into Japan are 5.8 percent for adhesives and 4.9 percent for sealants; the rates into the European Community (EC) are 7.1 to 7.8 percent for adhesives and 5.0 percent for sealants.

Standards represent a moderate non-tariff barrier to trade. To a large extent, standards for adhesives and sealants are identical or similar in Canada and the United States. Under the terms of the FTA, both countries have agreed to work toward further harmonization of standards. The differences are much more pronounced between Canada and Europe or Japan. As Canadian companies attain a broader international scope, they will need to be aware of the prevailing standards in their target foreign markets and, when sufficiently important, to take an active role in the standards development process.

Technological Factors

Although the manufacture of adhesives and sealants involves relatively simple processes, extensive knowledge and experience with the raw materials, their formulation (recipes) and compounding (mixing), is essential. Only a few companies perform research and development in Canada. Most Canadian subsidiaries rely on their foreign parents to provide new technology. Much of the sector depends on the large resin producers for the development of new polymer systems and guidelines for their use, with fine-tuning of formulations done by the adhesive and sealant manufacturers. This dependence does not allow any opportunities for Canadian companies to develop innovative products ahead of foreign competitors. Only a new orientation toward more research and development would overcome this condition.

Environmental as well as health and safety issues have been the driving force behind many recent technological changes. Manufacturers are facing pressure to produce products that emit smaller amounts of volatile organic compounds (VOC). In many cases, this goal has necessitated reformulation of products. The use of petroleum solvents can be significantly reduced by shifting to water-based formulations. Although this technology is advancing rapidly, there are applications where solvent-based products must still be used to achieve the desired performance. A second technique has been to decrease the amount of solvent (increasing the solids content). Some of these low-solvent formulations (the hot-melt products) are designed for application at elevated temperatures. A third option is replacement of hazardous solvents with less-hazardous solvents. In this case, the replacement product may be usable only until higher standards force another change.

Other Factors

The industry in Canada, as in many other countries, is experiencing increasing costs as companies try to comply with environmental and safety regulations. While these regulations have the immediate effect of reducing profitability, they also present an opportunity for manufacturers to develop safer replacement products and thereby gain a competitive advantage. Key federal and provincial legislative and regulatory regimes that deal with the import, transport, storage, manufacture, use or sale of hazardous chemical substances or goods include the *Transportation of Dangerous Goods Act* (both federal and provincial regulations); the *Hazardous Products Act;* the *Occupational Health and Safety Act;* the *Canadian Environmental Protection Act* (CEPA); and the *Workplace Hazardous Materials Information System* (WHMIS).

Evolving Environment

The consumption of low-cost adhesives and sealants in a variety of low- to medium-performance applications is still very large, but the overall market for these products is either flat or declining. However, in other segments of the industry, the prospects for growth and new opportunities are good. The growth rate for advanced technology applications is expected to be particularly strong. As imports put more pressure on their traditional markets, Canadian manufacturers will find themselves pushed toward these high-performance products. The following examples highlight some of the expected growth areas.

The packaging industry is expected to consume greater quantities of adhesives in containers and flexible packaging. While this industry uses many types of adhesives, hot-melt products are expected to grow most quickly, because they are particularly suitable to modern, high-speed processes.

New applications in construction represent huge potential markets. Floor systems can be adhesively bonded to supporting joists, adding increased strength and rigidity. Interior wallboard and panelling can be adhered to studs, providing wall surfaces free from blemishes caused by nail or screw heads. Structural sealants can be used to hold curtain wall panels and insulating glass units in place, sometimes without accompanying support from mechanical fasteners.

The automotive market also offers significant potential for new opportunities. Products are already used for interior applications (such as bonding decorative trim and carpeting, and sealing doors and windows) and for exterior applications (including vinyl roofs and side mouldings). Increased use of plastic composites and ceramics will lead to increased adhesive consumption. Even in conventional metal construction, adhesive usage is expected to increase to overcome the problems of corrosion and vibration noise associated with mechanical fasteners and spot welding.

The aerospace industry is also using increasing amounts of adhesives and sealants for essentially the same

reasons as the automotive industry. Additional opportunities exist for products suitable for use in high-temperature applications near engines, and for products able to withstand the increased stresses resulting from higher travelling speeds.

In Canada and throughout the world, the industry is fragmented. There are many participants, many types of products and many markets to be served. In the past few years, there has been a worldwide trend toward concentration of this industry through acquisitions and mergers. Acquisition may provide access to new technology and products, allow rationalization of production facilities and provide immediate access to new markets. Global concentration within this industry has resulted in a change in ownership for some subsidiary operations in Canada but has not resulted in significant rationalization.

Implementation of the FTA is lowering not only the cost of raw materials but also the selling prices of finished products. These counterbalancing effects should not strongly affect profitability in the Canadian market. Tariff elimination will provide additional incentive for foreign-controlled firms to rationalize on a North American basis, an initiative that may jeopardize some Canadian operations but may also provide investment opportunities.

Competitiveness Assessment

The Canadian adhesive and sealant industry is dominated by foreign-owned companies. Most of Canada's international trade is with the United States. Much of the sector does not compete in markets outside North America. Although free trade will narrow the gap, product prices are expected to remain somewhat higher in Canada than in the United States due to the higher costs associated with transportation and the provision of technical service. Very few Canadian-owned firms have manufacturing facilities in the United States or co-operative agreements with companies in that market.

Significant worldwide growth is anticipated in the technology-intensive area of high performance adhesives and sealants. Foreign competition in these products is expected to become more intense as companies assume a global business orientation. The prospects for continued success and growth are best for those Canadian producers that diversify away from a dependence on lower-performance products into these new high-performance areas.

With the advent of this more competitive environment, it appears that the industry will have to reassess its business strategy. Canadian-owned companies must increase access to state-of-the-art technology, move to larger-scale production of a narrower product range and develop expanded export markets. Subsidiaries of multinationals have ready access to new technology. The challenge for these companies is to secure exclusive mandates for the manufacture of specific products.

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

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PRINCIPAL STATISTICS[a]

	1983	1984	1985	1986	1987	1988	1989[b]
Establishments	55	54	54	57	55	60	60
Employment	1 372	1 350	1 400	1 840	1 970	1 900	1 900
Shipments ($ millions)	183	193	212	279	290	315	340
Shipments[c] (constant 1981 $ millions)	170	170	178	229	230	230	235

[a]Covers all of SIC 3792 for the adhesives industry and, for sealants, part of 3799, other chemical products industries; see *Chemical and Chemical Products Industries*, Statistics Canada Catalogue No. 46-250, annual.

[b]ISTC estimates.

[c]Based on industry selling price index for adhesives. See *Industry Price Indexes*, Statistics Canada Catalogue No. 62-011, monthly.

TRADE STATISTICS

	1983	1984	1985	1986	1987	1988	1989
Exports[a] ($ millions)	13	14	17	38	37	39	29
Domestic shipments ($ millions)	170	179	195	241	253	276	311
Imports[b] ($ millions)	77	85	98	107	118	131	130
Canadian market ($ millions)	247	264	293	348	371	407	441
Exports (% of shipments)	7	7	8	14	13	12	9
Imports (% of Canadian market)	31	32	33	31	32	32	29

[a]See *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly. Exports of sealants prior to 1988 are ISTC estimates.

[b]See *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.

SOURCES OF IMPORTS[a] (% of total value)

	1984	1985	1986	1987	1988	1989
United States	92	91	89	88	88	89
European Community	5	6	8	9	8	7
Pacific Rim	1	1	2	2	1	1
Other	2	2	1	1	3	3

[a]See *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.

DESTINATIONS OF EXPORTS[a] (% of total value)

	1984	1985	1986	1987	1988	1989
United States	70	84	92	90	76	81
European Community	9	8	4	4	1	2
Pacific Rim	3	1	–	2	11	6
Other	18	7	4	4	12	11

[a]See *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly. Prior to 1988, data is for adhesives only.

REGIONAL DISTRIBUTION[a] (average over the period 1986 to 1988)

	Atlantic	Quebec	Ontario	Prairies	British Columbia
Establishments (% of total)	6	20	65	6	3
Employment (% of total)	X	X	82	X	X
Shipments (% of total)	X	X	79	X	X

[a]Based on Statistics Canada data for the adhesive industry (SIC 3792) only.
X: confidential

MAJOR FIRMS

Name	Country of ownership	Location of major plants
CSL Silicones Inc.	Canada	Guelph, Ontario
Canadian Adhesives Limited	Germany	Montreal, Quebec Brampton, Ontario
Chembond Limited	Canada	Mississauga, Ontario
Dow Corning Canada Inc.	United States	Mississauga, Ontario
H.B. Fuller Canada Inc.	United States	Boucherville, Quebec Mississauga, Ontario
GE Silicones Canada Ltd.	United States	Port Union, Ontario
Halltech Inc.	Canada	West Hill, Ontario
Helmitin Canada Inc.	Canada	Montreal, Quebec Etobicoke, Ontario
Lepage's Limited	United Kingdom	Brampton, Ontario
Mapei Canada Inc.	Italy	Laval, Quebec

(continued)

MAJOR FIRMS (continued)

Name	Country of ownership	Location of major plants
Mulco Inc.	Canada	Saint-Hubert, Quebec
Nacan Products Limited	United Kingdom	Boucherville, Quebec Toronto, Ontario Surrey, British Columbia
PRC Canada Inc.	United Kingdom	Rexdale, Ontario
Pierce & Stevens Canada Inc.	United States	Fort Erie, Ontario
Roberts Company Canada Limited	United States	Bramalea, Ontario
Swift Adhesives Ltd.	Japan	Moncton, New Brunswick Pointe-Claire, Quebec Bramalea, Ontario Winnipeg, Manitoba Burnaby, British Columbia
Timminco Industrial Adhesives	Canada	Pointe-Claire, Quebec North York, Ontario
Tremco Ltd.	United States	Toronto, Ontario

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