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I N D U S T R Y
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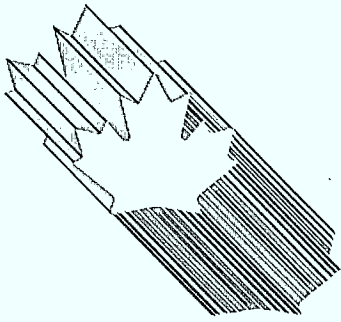


Industry, Science and
Technology Canada

Industrie, Sciences et
Technologie Canada

**Structural Wood-Based
Panel Products**

Canada



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

STRUCTURAL WOOD-BASED PANEL PRODUCTS

1988

FOREWORD



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.

1. Structure and Performance

Structure

The structural wood-based panel products industry is made up of two major sub-sectors: *softwood plywood* and *waferboard/oriented strandboard (OSB)*. (Non-structural wood-based panel products are described in another profile). Softwood veneer, which is an intermediate product used in the manufacture of plywood, is produced by a number of specialized manufacturers as well as by plywood producers. Considerable volumes of veneer are sold in export markets for the manufacture of softwood plywood, so this product will be included as part of the softwood plywood sub-sector. OSB is a second-generation waferboard with improved physical properties, which is used in the same applications as waferboard.

Softwood plywood is manufactured in specialized mills which either produce the veneer they require on in-plant rotary lathes or purchase it from other veneer manufacturers. The sheets of veneer are first trimmed to remove waste, then dried, treated with a waterproof glue and consolidated under high pressure in multi-opening hot presses. Plywood is usually manufactured in 4 ft. x 8 ft. panels (1.22 m x 2.44 m), although some mills produce other sizes for special end uses.

Waferboard/OSB is produced in mills which reduce aspen logs to rectangular flakes or strands. After the flakes are dried, they are blended with resin and deposited on continuously moving mats. Some mills orient the wafers or strands in different directions throughout the mat to impart various desirable physical properties to the finished product. The mat is then pressed under heat into large panels, which are cut to the standard 4 ft. x 8 ft. size (1.22 m x 2.44 m), although others are also available.

Softwood plywood and waferboard/OSB compete for many but not all end uses and are generally sold in standard-sized panels used primarily for construction, packaging and industrial applications. Softwood plywood, including upgraded specialty products such as overlaid concrete-form plywood, is used extensively in engineered structures, as well as industrial and packaging applications in domestic and offshore markets. Waferboard/OSB is used predominantly in the residential and commercial construction sector in both Canada and the United States. At present, only limited volumes of waferboard/OSB are exported offshore and very little of the product is upgraded.

Because all products included in this industry are manufactured with waterproof adhesives, they are suitable for most exterior end-use applications. To a large extent, the use of softwood plywood in Canadian residential construction has been replaced by the less expensive waferboard/OSB, particularly in the east. With the exception of some wall sheathing applications in residential buildings, the structural wood-based panel products industry does not face competition from other products.

Minister

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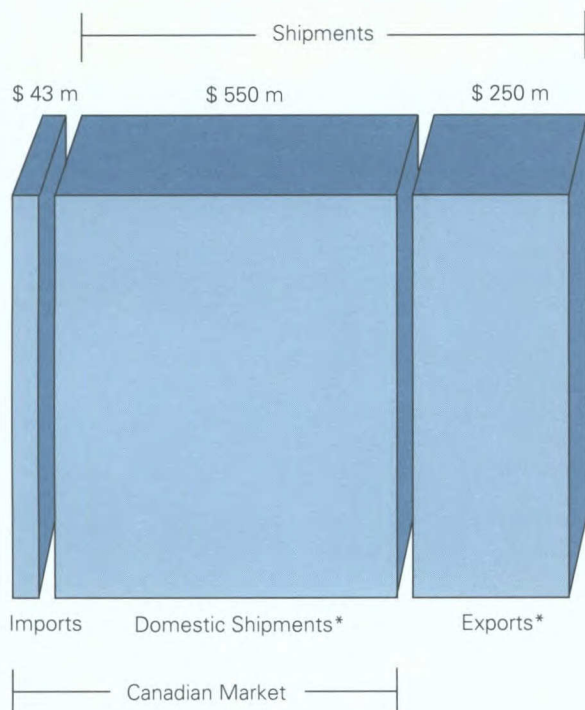
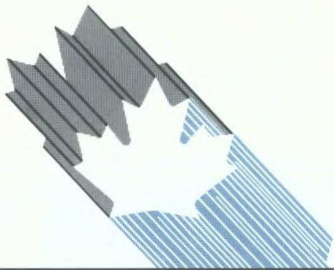
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**Imports, Exports and Domestic Shipments
1986**

* *ISTC estimate*

In 1986, the value of shipments for the sector totalled an estimated \$800 million, which represented about 6.8 percent of total wood products shipments. About 80 percent of softwood plywood and some 50 percent of waferboard/OSB is consumed in the domestic market. Domestic shipments of softwood plywood in 1986 were valued at an estimated \$400 million, and those of waferboard/OSB at \$150 million. The industry currently employs an estimated 6700 persons directly, and there are additional jobs in related forest harvesting operations.

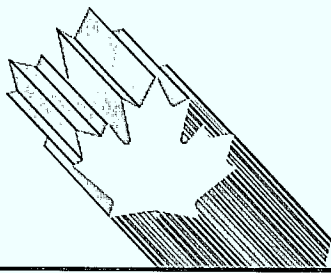
Exports in 1986 were valued at \$250 million and included sales of waferboard/OSB and softwood veneer to the United States, and softwood plywood sales to the European Community (E.C.) and Japan. Exports represented about 31 percent of the value of all structural panel product shipments in 1986. By comparison, imports in 1986 (largely U.S.-produced softwood plywood) grew to seven percent of domestic structural panel consumption. Except during periods when production was curtailed, plywood imports have not generally been a significant factor in the Canadian market, due mainly to differences in product standards, high Canadian tariffs, and currency exchange rates unfavourable to imports into Canada.

The softwood plywood sub-sector is based on two major, relatively slow-growing species groups — Douglas fir, found mainly in the southwestern part of British Columbia, and spruce, pine and fir, which grow throughout the rest of Canada. Because of competition for these trees from the softwood lumber industry and the long time they need to reach a suitable harvesting size, the traditional resource in terms of log size has been declining. As a result, the British Columbia coastal industry is now using some Hemlock and Balsam fir in the manufacture of plywood. Nevertheless, an adequate supply of peeler-quality logs should continue to be available to most producers over the medium-to-longer term. Waferboard/OSB, on the other hand, is based almost entirely on rapidly growing aspen, which can be found in abundance in a wide belt across the country.

The softwood plywood sub-sector has 24 operating softwood plywood manufacturing establishments and 10 softwood veneer mills. There are 14 waferboard/OSB mills, one of which is currently not producing, as well as several mills under construction. About half of the softwood plywood-veneer and waferboard/OSB plants (representing about 60 percent of total capacity) are owned by large, integrated, forest product companies. Eight of the waferboard/OSB mills in Canada are owned by companies which also produce softwood plywood. The plywood mills which are not associated with waferboard/OSB manufacturers are owned by smaller independent owners and co-operatives. One is owned by a provincial government.

While some 65 percent of current capacity in structural wood-based panel products is Canadian-owned, foreign ownership is also significant, particularly in the plywood sub-sector. Four softwood plywood mills are controlled by U.S. interests, four by New Zealand, and one is partly owned by a Japanese group. Three of the softwood veneer producers are also owned by foreign interests. In the waferboard/OSB sub-sector, five of the operating Canadian plants are owned to a significant degree by U.S. interests.

The distribution of products in the domestic market is carried out by large, integrated distribution organizations (some owned by producers), independent wholesalers as well as national and local building supply centres. Softwood plywood is marketed offshore by relatively few exporters. In the United States, Canadian waferboard/OSB is distributed by a network similar to the one in Canada, comprising integrated distributors and national and local wholesalers, some of which are owned by U.S. producers. In addition, at least one integrated Canadian producer has established a U.S. distribution system to market its full range of wood-based products.



The capacity of the Canadian industry is currently estimated at about five billion square feet (BSF) on a 3/8-in. basis (4.4 million cubic metres). The comparable American capacity for similar products is an estimated 32 BSF (28.3 million cubic metres). Canadian plants represent about 12 percent of total world capacity, which is estimated at more than 40 BSF (more than 35 million cubic metres).

The Canadian waferboard/OSB sub-sector represents about 34 percent of total North American capacity. Offshore exports have been limited to relatively small volumes by the existence of high tariffs, lack of acceptance by foreign building codes, higher transportation costs compared to softwood plywood and a lack of product knowledge in most offshore markets. Indeed, waferboard/OSB had been a North American product exclusively until the recent openings of several plants in Europe and New Zealand.

During 1987, a number of new OSB mills came on stream in British Columbia and Alberta. New waferboard/OSB projects are now under construction in Ontario and Quebec and several others are under consideration. While no new softwood plywood mills have been announced, significant capacity expansion is being achieved through mill modernization programs. One new softwood veneer plant began production in 1988.

It is estimated that 85 percent of softwood plywood capacity is concentrated in British Columbia, with the remainder spread across the country. About 90 percent of softwood veneer capacity is also located in British Columbia, with the remainder in Alberta. Waferboard/OSB manufacturing capacity is located in the Prairies (33 percent), Quebec (26 percent), Ontario (24 percent), British Columbia (11 percent) and the Atlantic provinces (six percent).

Performance

Within the structural wood-based panel products industry, there has been a considerable price-related substitution of waferboard/OSB for softwood plywood. Between 1977 and 1987, Canadian waferboard/OSB capacity expanded rapidly from 12 to about 47 percent of total structural wood-based panel capacity. Waferboard/OSB production grew at an average annual rate of about 13 percent between 1978 and 1987. Softwood plywood production grew at an average annual rate of 3.5 percent between 1973 and 1978, then declined by 10.2 percent during the 1978-1982 period. After the recession of the early 1980s, softwood plywood output recovered to the production levels of the early 1970s. The overall growth of the whole industry has been due to continuing residential building activity and strong exports of waferboard/OSB to the United States.

In the past, exports of Canadian softwood plywood have been relatively stable at about 20 percent of production. Over the past three years, however, export shipments have been declining, so that by 1987, they represented only about 12 percent of the total. Offshore exports to the E.C. continue to face intense price competition from U.S. plywood. Waferboard/OSB exports to the United States have generally increased over the past five years in spite of competition from both U.S. plywood and an increasing volume of U.S.-produced waferboard/OSB.

During 1987, Canadian structural wood-based panel mills operated at about 90 percent of capacity. The rate of utilization would have been even higher, except for the start up of some new waferboard/OSB capacity and the modernization of several plywood mills. At the same time, the U.S. industry operated at 81 percent of capacity, a level similarly depressed by the start up of some new waferboard/OSB mills. Over the past five years, the rapid increase in waferboard/OSB production has caused an oversupply of structural panels in the domestic market, which has depressed prices of both waferboard/OSB and softwood plywood.

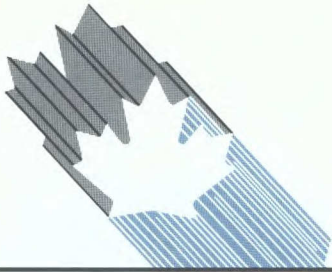
In the past, waferboard/OSB has sold at a price of about 15 percent below that of softwood plywood. The recent oversupply of waferboard/OSB and the recovery of softwood plywood for some end uses have widened the price differential between the two products in North America. During the first quarter of 1988, softwood plywood sold at a premium of 35 to 50 percent over waferboard/OSB used for the same end uses. This widening price differential was due to both overcapacity and some builder and consumer preferences for softwood plywood.

2. Strengths and Weaknesses

Structural Factors

Existing Canadian waferboard/OSB mills are smaller than the largest mills currently producing or under construction in the United States. New Canadian waferboard/OSB mills are generally large plants built to take advantage of economies of scale. Unlike most Canadian mills, some U.S. OSB plants built in the mid-1980s have a relatively small capacity designed to serve regional markets. Plant capacity of Canadian softwood plywood mills is generally similar to that in the United States.

One of the most significant differences between the Canadian softwood plywood sub-sector and its U.S. counterpart is the level of output by grade. In the United States, about 45 percent of total softwood plywood production is C-D grade. This is a lower-grade sheathing product not manufactured in Canada, but which provides strong competition for Canadian sheathing plywood in offshore markets that are price-sensitive. Production of the C-D grade in Canada is not considered commercially viable, given the characteristics of the wood resource available domestically.



Average raw material costs for Canadian-produced softwood plywood and waferboard/OSB represent about 40 and 35 percent of manufacturing costs respectively. These costs are estimated to be somewhat lower than comparable U.S. prices. However, recent provincial stumpage increases and resource competition have raised raw material costs to the plywood sub-sector.

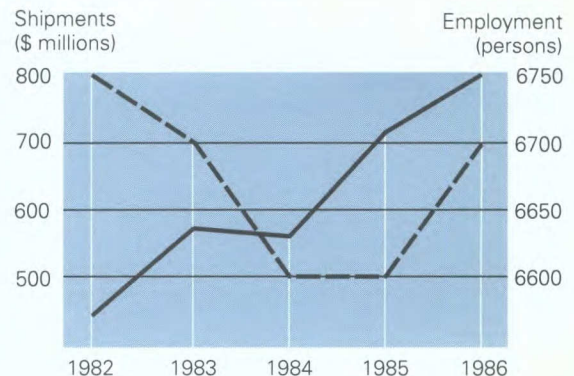
The wood cost for the production of waferboard/OSB, manufactured principally from readily available aspen, is much lower than that for plywood. New pulp mill projects, which use large volumes of aspen (particularly in western Canada), will, however, increase the pressure on the resource and drive wood cost up. The American industry is also concerned that an adequate supply of suitable raw material may not be available to support, over the long term, the present level of U.S. output.

Resin, energy and labour are the major components of manufacturing costs in the structural panel industry. The average costs incurred by domestic softwood plywood producers are estimated to be somewhat higher than those of their U.S. counterparts. At the same time, while resin and labour costs are higher in Canada than in the United States, they are partially offset by lower energy and raw material costs. On average, production costs of Canadian waferboard/OSB manufacturers are marginally lower than those of American producers.

It is important that production facilities are close to major consuming regions because of the relatively high transportation costs. In this context, the waferboard/OSB sub-sector has an advantage over softwood plywood since about 50 percent of its capacity is situated near major domestic markets in eastern Canada. The potential transportation advantage of Prairie waferboard/OSB producers, which ship to major markets in eastern Canada, is largely offset by the greater weight of waferboard/OSB relative to softwood plywood produced in British Columbia.

Trade-related Factors

There is very little trade in softwood plywood between Canada and the United States with the current Canadian tariff at 15 percent and its U.S. counterpart at 20 percent. Certain grades of softwood plywood enter the E.C. under an annual GATT-bound duty-free global quota of 650 000 cubic metres (736 million square feet 3/8-in. basis). Volumes in excess of the quota are subject to a 10 percent tariff. The E.C. imports certain types and thicknesses not included in the quota which are also subject to the same tariff. A 15 percent tariff and competition from Asian hardwood plywood manufacturers have limited Canadian exports to Japan in the past. However, Japanese plywood tariffs were recently reduced to 10 percent. As well, Canadian softwood plywood used in residential construction can now be graded to Japanese standards at Canadian mills.



Shipments* —————

Employment* - - - - -

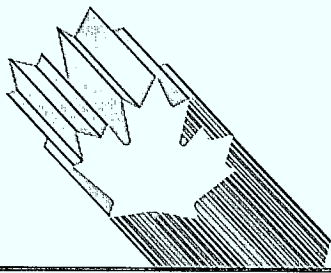
Total Shipments and Employment

* ITC estimate

The principal export market for Canadian waferboard/OSB is the United States. The acceptance of waferboard/OSB by U.S. residential building codes, a low four percent tariff, and a rapidly expanding market are factors contributing to the industry's export performance. Exports to offshore markets, particularly to the E.C., have been limited by a 10 percent tariff, the lack of acceptance of waferboard/OSB by European building codes and limited product knowledge. In Canada, the import duty is currently four percent.

Under the terms of the Canada-U.S. Free Trade Agreement (FTA), the Canada Mortgage and Housing Corporation (CMHC) evaluated the U.S. C-D grade of plywood to determine whether it can be used in housing financed by CMHC. The evaluation confirmed CMHC's initial decision not to approve its use. The FTA provides a review process which the United States decided to forego in favour of a binational committee of experts to oversee the establishment of "bond durability criteria" and "test methods" required to complete development of common performance standards.

The new trade remedy procedures and binational dispute-settlement mechanism provided under the FTA will therefore be important to this industry. However, until the issue of plywood standards is successfully resolved, the United States has indicated that it will not proceed with the phased-in elimination of tariffs for softwood plywood, waferboard/OSB or particleboard. Canada considers the U.S. position on tariff elimination to be inconsistent with the FTA but also maintains the option of delaying implementation of tariff concessions.



Technological Factors

The Canadian softwood plywood industry depends largely on U.S. and offshore equipment manufacturers for major components such as presses, conventional lathes and dryers. Some specialized veneer clipping, sorting and other handling equipment is manufactured in Canada and is also available to foreign competitors. A significant number of major components in Canadian and U.S. waferboard/OSB mills originate abroad, particularly from suppliers located in the Federal Republic of Germany (F.R.G.).

Recent process-related technological developments, such as the spindleless lathe, veneer incisors, moisture sensors and new glue spreading techniques, are expected to improve competitiveness through superior fibre utilization and reduced manufacturing costs. These developments will also provide offshore export opportunities for softwood veneer in the Pacific Rim. Equipment manufacturers and suppliers in Canada, the F.R.G., the United States and Scandinavia play an important role in the industry. Consequently, the technology is generally available to all producers.

Technology to develop new products and improve existing ones such as specialty plywood, including overlaid panels for concrete forming, is well established at a number of major companies. Research to develop a stabilized waferboard/OSB is also under way, which, if successful, will significantly reduce moisture-related swelling and enable waferboard to be treated with chemical preservatives. As well, research is being carried out on new resin technology which will benefit both plywood and waferboard/OSB manufacturers.

Technology to improve both the product and the manufacturing process is being developed by facilities such as Forintek Canada Corp. and the Plywood Technical Centre of the Council of Forest Industries (COFI) of British Columbia.

Other Factors

Because of its narrow operating margins, the industry's export performance is affected to an important degree by currency exchange relationships. An example is the decline in Canadian exports of softwood plywood to Italy which occurred in the early 1980s.

Since one of the major end uses for structural panels is in residential and non-residential construction, the cyclical nature of the construction industry has a significant impact on plywood and waferboard/OSB producers. However, seasonal variation in domestic demand for the softwood plywood sub-sector is offset to a large degree by export opportunities in the first half of each year due to the European plywood requirements associated with the E.C. duty-free quota.

3. Evolving Environment

The structural wood-based panel industry is highly sensitive to residential construction activity in both Canada and the United States. Longer-term forecasts suggest overall growth in market demand fuelled by significant increases in non-residential construction, the repair and renovation industry and industrial end uses. Some declines are expected because demographic factors will reduce the number of housing starts. In Canada, the repair and renovation market currently represents about 16 percent of total industry consumption and is growing.

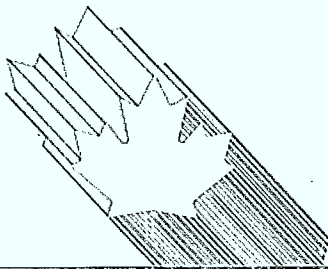
Over the long term, waferboard/OSB will continue to replace plywood in many applications and is expected to represent about 75 percent of structural wood-based panel demand by 2010. The softwood plywood industry continues to be under pressure to find alternative markets abroad or develop improved or higher-value uses and products. However, it has recovered some market share in domestic residential roofing applications.

The much larger U.S. softwood plywood industry can also be expected to intensify its marketing efforts in Europe and elsewhere as its domestic market is eroded by waferboard/OSB. Canada's share of U.S. waferboard/OSB markets dropped from 46 percent in 1981 to 17 percent in 1987 and will continue to decline for the next few years because of the significant expansion in U.S. waferboard/OSB capacity. Nevertheless, the volume of Canadian exports to the United States should continue to grow.

Offshore markets such as the E.C. and Japan have historically represented about 20 percent of production, and will continue to be important markets for Canadian softwood plywood. However, intense competition can be anticipated from U.S. C-D grade plywood and European and other foreign plywood. Exports of Canadian plywood to Japan should improve further with the recent reduction in import tariffs and Japanese government approvals qualifying COFI as a Foreign Testing Organization. The latter will allow COFI-approved Canadian mills to grade stamp softwood plywood as meeting Japanese standards and avoid costly re-grading in Japan.

The application of emerging technology in the industry can be expected to enhance raw material use and productivity and to improve energy conservation. Recent R&D activities include the development of a new edge profile for plywood used in roofing, foamed adhesives and application equipment, moisture sensors and steam injection presses.

Employment levels are not likely to change significantly over the medium term, although some shifts between the two sub-sectors are likely as waferboard/OSB continues to increase its share of total sector output.



4. Competitiveness Assessment

The softwood plywood sub-sector continues to be competitive in domestic and several offshore markets, even though waferboard/OSB continues to be substituted for softwood plywood in residential sheathing applications, particularly in large domestic housing developments. Softwood plywood is currently preferred for a number of industrial uses, including packaging and concrete forming. Another factor is the significant reduction in manufacturing costs as a result of recent technological advances and investment by the industry.

If current discussions on the harmonization of softwood plywood standards in Canada and the United States are successful and tariff reductions are implemented, some rationalization and adjustment can be anticipated. Although only limited trade in softwood plywood exists between the two countries at present, removal of tariffs could result in increased Canadian imports of American C-D grade plywood with some increases in the export of Canadian specialty softwood plywood products.

The Canadian waferboard/OSB sub-sector is currently competing effectively in both domestic and U.S. markets. Although some rationalization of older plants in Canada will occur, waferboard/OSB can be expected to continue to maintain its penetration of residential sheathing markets and gain increasing acceptance in the growing renovation, industrial and do-it-yourself sectors. Offshore market opportunities have been limited and this situation is unlikely to improve in the short to medium term because of tariff barriers and lack of acceptance of the product outside of North America. Once the softwood plywood standards issue is resolved, the FTA will have a positive impact on the domestic waferboard/OSB industry.

The establishment of new trade remedy procedures and a dispute-settlement mechanism under the FTA is expected to enhance secure market access for existing and future products within the entire structural wood-based panel products industry.

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

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Industry, Science and Technology Canada
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235 Queen Street
Ottawa, Ontario
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PRINCIPAL STATISTICS

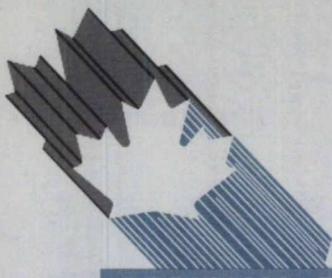
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	1973	1981	1982	1983	1984	1985	1986
Establishments ^e	28	44	45	46	45	45	46
Employment ^e	5 000	6 600	6 750	6 700	6 600	6 600	6 700
Shipments (\$ millions) ^e	327	606	441	578	571	715	800

TRADE STATISTICS

	1973	1981	1982	1983	1984	1985	1986
Exports (\$ millions) ^e	70	149	165	195	247	275	250
Domestic shipments (\$ millions) ^e	257	457	276	383	324	440	550
Imports (\$ millions)	24	42	12	14	18	19	43
Canadian market (\$ millions) ^e	281	499	288	397	342	459	593
Exports as % of shipments	21	25	37	34	43	38	31
Imports as % of domestic market	9	8	4	4	5	4	7
Canadian share of international market (%)	7	10	9	10	13	13	12
Source of imports (% of total value)				U.S.	E.C.	Asia	Others
			1981	99	—	1	—
			1983	99	—	1	—
			1984	99	—	1	—
			1985	99	—	1	—
			1986	99	—	1	—
Destination of exports (% of total value)				U.S.	E.C.	Asia	Others
			1981	27	69	3	1
			1983	41	54	3	2
			1984	50	46	3	1
			1985	56	39	2	3
			1986	62	34	3	1

(continued)



REGIONAL DISTRIBUTION — Average over the last 3 years

	Atlantic	Quebec	Ontario	Prairies	B.C.
Establishments – % of total	1	11	13	20	55
Employment – % of total	1	7	14	18	60
Shipments – % of total	1	17	21	21	40

MAJOR FIRMS

Name	Ownership	Location of Major Plants
Weldwood of Canada Limited	American	Vancouver, Williams Lake, Quesnel, British Columbia; Slave Lake, Alberta; Longlac, Ontario
Fletcher Challenge Canada Ltd.	New Zealand	Delta, New Westminster, Kelowna, Armstrong, British Columbia
MacMillan Bloedel Limited	Canadian	Port Alberni, British Columbia; Hudson Bay, Saskatchewan; Thunder Bay, Ontario
Normick Perron Inc.	Canadian	La Sarre, Val-d'Or, Chambord, Quebec
Pelican Spruce Mills Ltd.	Canadian	Edson, Drayton Valley, Alberta

e ISTC estimate

Note: Statistics Canada data have been used in preparing this profile.

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