UNITED STATES TARIFF COMMISSION

FLAT GLASS AND TEMPERED GLASS

Report to the President
on Investigation No. TEA-I-23
Under Section 301(b)(1) of the Trade Expansion Act of 1962

TC Publication 459
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UNITED STATES TARIFF COMMISSION

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OFFICE OF THE SPECIAL REPRESENTATIVE FOR TRADE NEGOTIATIONS
EXECUTIVE OFFICE OF THE PRESIDENT
WASHINGTON, D. C. 20506

Phasing Out of Escape Clause Protection on Window Glass Begun

The Deputy Special Representative for Trade Negotiations, William R. Pearce, announced today that President Nixon has decided to take no action on the report of the Tariff Commission on Flat Glass and Tempered Glass. In this case, the Tariff Commissioners were evenly divided on the question of whether the domestic sheet glass industry is threatened with injury as a result of increased imports due in major part to trade agreement concessions.

Since the President has taken no action on the Tariff Commission report, the previously scheduled three stage termination of escape clause tariff protection on window glass began on April 30 in accordance with the provisions of Proclamation 4102 of January 29, 1972. The phasing out of escape clause action tariff increases does not affect the rights of workers in the sheet glass industry to request certification of eligibility to apply for adjustment assistance, as provided in an earlier proclamation.

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INFORMATION OBTAINED IN THE INVESTIGATION

Note.--The whole of the Commission's report to the President may not be made public since it contains certain information that would result in the disclosure of the operations of individual concerns. This published report is the same as the report to the President, except that the above-mentioned information has been omitted. Such omissions are indicated by asterisks.

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REPORT TO THE PRESIDENT

U.S. Tariff Commission,
January 31, 1972.

Mr. President:

In accordance with section 301(f)(1) of the Trade Expansion Act of 1962 (76 Stat. 885), the U.S. Tariff Commission herein reports the results of an investigation made under section 301(b) of that act relating to cast or rolled glass, sheet glass, plate and float glass (including polished wire glass), and toughened (specially tempered) glass.

Introduction

The investigation to which this report relates was undertaken to determine whether--

> glass of the kinds provided for in items
> 541.11-542.98, 543.11-.69, and 544.31-.32
> of the Tariff Schedules of the United States

is, as a result in major part of concessions granted thereon under trade agreements, being imported into the United States in such increased quantities as to cause, or threaten to cause, serious injury to the domestic industry or industries producing like or directly competitive products.

The investigation was instituted on August 16, 1971 upon petition filed on July 30, 1971 by the principal domestic producers. 1/ Public notice of the investigation and a public hearing to be held in

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1/ ASG Industries, Inc., the Libbey-Owens-Ford Co., C-E Glass, Inc., and the PPG Industries, Inc.

connection therewith was given in the Federal Register of August 20, 1971 (36 F.R. 16223). The hearing was held November 9, 11, 12, and 15, 1971, and all interested parties were afforded opportunity to be present, to produce evidence, and to be heard. A transcript of the hearing and copies of formal briefs submitted by interested parties in connection with the investigation are attached. 1/

The Commission has had a number of investigations on the products concerned under the provisions of section 7 of the Trade Agreements Extension Act of 1951, as amended, and section 301 of the Trade Expansion Act of 1962.

On May 25, 1961, the Commission reported its findings as a result of an investigation on rolled glass 2/ under section 7 of the Trade Agreements Extension Act of 1951, as amended. The Commission was divided (3-2-1) on its findings and made no recommendation to the President. Three Commissioners made a negative finding; two Commissioners found that the domestic industry was being seriously injured within the terms of the statute, and one Commissioner found that the domestic industry was being threatened with serious injury.

On May 17, 1961, the Commission reported its findings as a result of an investigation of sheet glass 3/ under section 7 of the Trade Agreements Extension Act of 1951, as amended. The Commission

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1/ The transcript and briefs were transmitted with the original report sent to the President.

2/ Rolled Glass: Report to the President on Escape-Clause Investigation No. 7-102, TC Publication 21, 1961.

3/ Cylinder, Crown, and Sheet Glass: Report to the President on Escape-Clause Investigation No. 7-101, TC Publication 17, 1961.

unanimously made an affirmative finding, but the Commissioners were divided (4-2) on the remedy. The President on June 17, 1962 (Proclamation No. 3458, dated March 27, 1962) proclaimed the increased rates of duty recommended by the majority of the Commission. Subsequently, in January 1967, the President modified the escape action he had taken in 1962, reducing the escape-action rates applicable to most window glass and removing those applicable to other sheet glass.

On December 29, 1969, the Commission reported its findings as a result of an investigation on flat glass and tempered glass [1/] under section 301(b)(1) of the Trade Expansion Act of 1962. The Commission was equally divided (3-3) on its findings on sheet glass, and made a negative finding (4-2) on all other flat glass and tempered glass. As a result of the Commission's finding on sheet glass the President reimposed the existing modified escape-action rates on window glass, but provided for a reestablishment of the trade-agreement rates in three annual stages, the first of which is scheduled to become effective on January 31, 1972.

On December 30, 1971, [2/] as a result of its investigation on sheet glass under section 351(d)(3) of the Trade Expansion Act of 1962, the Commission reported to the President on the probable economic effect of the termination of the escape-action rates of duty. The

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1/ Flat Glass and Tempered Glass: Report to the President on Investigation No. TEA-I-15 under Section 301(b)(1) of the Trade Expansion Act of 1962, TC Publication 310, December 1969.

2/ Sheet Glass (Blown or Drawn Flat Glass): Report to the President on Investigation No. TEA-I-EX-7 under Section 351(d)(3) of the Trade Expansion Act of 1962, TC Publication 449, December 1971.

Commissioners participating 1/ unanimously advised the President that in their view the termination of the escape-action rates of duty could lead to serious impairment of the economic condition of the sheet glass industry.

Findings of the Commission

On the basis of its investigation, the Commission finds unanimously that glass of the kinds provided for in items 541.11-.31 (hereinafter referred to as rolled glass), 543.11-.69 (hereinafter referred to as plate and float glass), and 544.31-.32 (hereinafter referred to as tempered glass) of the Tariff Schedules of the United States (TSUS) are not, as a result in major part of concessions granted thereon under trade agreements, being imported into the United States in such increased quantities as to cause, or threaten to cause, serious injury to the domestic industry or industries producing like or directly competitive products.

With respect to glass of the kinds provided for in items 542.11-.98 (hereinafter referred to as sheet glass) of the TSUS, the the Commission is divided into two equal groups. Chairman Bedell and Commissioners Sutton and Moore find (1) that such glass is, as a result in major part of concessions granted thereon under trade agreements, being imported into the United States in such increased quantities as to threaten to cause serious injury to the domestic industry producing like or directly competitive articles; and (2) that,

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1/ Commissioners Leonard and Young did not participate.

in order to prevent serious injury, it is necessary to increase the column numbered 1 rate of duty for items 542.31, -.33, -.35, -.71, -.73, and -.75 of the TSUS to rates of duty as follows:

542.31 - 1.3¢ per lb.
542.33 - 1.6¢ per lb.
542.35 - 1.9¢ per lb.
542.71 - 1.3¢ per lb. plus 2.5 percent ad val.
542.73 - 1.6¢ per lb. plus 2.5 percent ad val.
542.75 - 1.9¢ per lb. plus 2.5 percent ad val.

Vice Chairman Parker and Commissioners Leonard and Young find that such glass is not, as a result in major part of concessions granted thereon under trade agreements, being imported into the United States in such increased quantities as to cause, or threaten to cause, serious injury to the domestic industry producing like or directly competitive articles. In a situation of this kind, section 330 of the Tariff Act of 1930, as amended by section 201 of the Trade Agreements Extension Act of 1951, requires that the findings of each group of Commissioners shall be transmitted to the President, and provides that those of either group may be considered by the President as the findings of the Commission.

Views of Chairman Bedell and Commissioners
Sutton and Moore

This investigation under section 301(b)(1) of the Trade Expansion Act of 1962 was undertaken in response to a petition for tariff adjustment filed on behalf of the principal domestic producers of flat glass and tempered glass. Under that section, the Tariff Commission must determine whether, as a result in major part of concessions granted under trade agreements, an article is being imported into the United States in such increased quantities as to cause, or threaten to cause, serious injury to the domestic industry producing an article which is like or directly competitive with the imported article.

In the present case, as in the 1969 case concerning these products, the Commission has been called upon to make such a determination with respect to the various types of flat glass--sheet, plate, float, rolled, and polished wire--and with respect to tempered glass. In varying degree, the various types of flat glass compete directly with one another. Plate and float glass have comparable physical properties, and they are used interchangeably throughout virtually the full range of their joint commercial applications. They may thus properly be regarded, for the purposes of reaching our decision, as one article. Rolled glass rests almost at the opposite end of the competitive spectrum; it is rarely used interchangeably with other types of flat glass, and certainly is not directly competitive to any substantial degree with any of them. Polished wire

glass is generally used in special applications for which other types of flat glass would not be considered but is produced in the plants in which rolled glass is produced; we therefore consider polished wire glass as part of the rolled glass industry.

Although float glass competes directly with some sheet glass, such direct competition currently is confined principally to heavy sheet glass. Window and thin sheet glass, which in 1970 together accounted for two-thirds of the total U.S. consumption of sheet glass, receives little direct competition from float glass. Thus, although improved technology makes the production of float glass in window glass thicknesses feasible, the greater part of the sheet glass market has not yet been subject to direct inter-product competition from float glass. In the light of these competitive conditions, then, we regard flat glass as three distinct articles--sheet glass, plate and float glass, and rolled and polished wire glass. Tempered glass--a product further processed than flat glass--stands apart.

As indicated by findings given earlier, we have concluded that the domestic sheet glass industry faces a threat of serious injury by reason of increased imports resulting in major part from trade-agreement concessions and that an increase in the rates of duty applicable to clear and colored window glass not over 100 united inches to the original 1962 escape-action rates is necessary to prevent serious injury.

With respect to rolled and polished wire glass, plate and float glass, and tempered glass, we have made negative determinations on the grounds that imports resulting in major part from trade-agreement concessions have not been the major factor in causing or threatening to cause any serious injury to the industries concerned.

Sheet glass

Within the meaning of the statute, sheet glass is being imported into the United States in increased quantities as a result in major part of trade-agreement concessions. The major trade-agreement concessions applicable to sheet glass were granted by the United States in 1948 and 1951; the concessions resulted in almost halving the rates of duty on those products. Concessions were also granted in the 1956 negotiations, but the resultant reductions in rates of duty were minor in relation to the earlier reductions. In 1962, following an escape-clause investigation by the Tariff Commission under section 7 of the Trade Agreements Act of 1951, as amended, the President modified temporarily the U.S. concessions on sheet glass and imposed increased rates of duty. In January 1967 the President, pursuant to the provisions of section 351(c)(1)(A) of the Trade Expansion Act, reduced (but did not eliminate) the escape-action rates on most window glass, and restored the concession rates on other sheet glass (chiefly thin and heavy sheet glass).

For purposes of making a determination in this case, the trends of U.S. imports of sheet glass must be viewed against the above history of trade-agreement concessions and escape-clause actions.

Following the 1948 and 1951 trade-agreement concessions, U.S. imports of sheet glass rose rapidly. By 1960, entries of sheet glass, at most-favored-nation rates of duty were more than 10 times larger than average annual imports in 1948-52, the period during which the major trade-agreement concessions were placed in effect. Since then U.S. imports of sheet glass, though fluctuating, have remained at a high level, even though escape-action rates have been in effect much of that time. Since 1968 annual U.S. imports of sheet glass have declined. That decrease occurred, however, following an abnormally high level of imports--entries in 1968 being unusually higher than in any other year before or since. Despite the recent fluctuations, imports of sheet glass are many times greater than in the years in which the major trade-agreement concessions were granted. Imports in 1970 of window glass dutiable at most-favored-nation rates were nearly 20 times greater than the annual average imports of window glass during 1948-51. Considering, then, both short-term and long-term imports of sheet glass and the trade-agreement concessions granted thereon, we must conclude that, within the terms of the statute, sheet glass is being imported in increased quantities in major part as a result of trade-agreement concessions.

In its recent report respecting sheet glass under section 351(d)(3) of the Trade Expansion Act of 1962, 1/ the Commission

1/ United States Tariff Commission, Sheet Glass (Blown or Drawn Flat Glass), Report to the President on Investigation No. TEA-I-EX-7 under Section 351(d)(3) of the Trade Expansion Act of 1962, TC Publication 449, Washington, D.C., December 1971, pp. 7-11.

emphasized that imports have offered strong competition to the domestic sheet-glass producers, and that the economic health of the industry is poor and remains under heavy competitive pressures from imports. In that respect we stated that "termination of a part of the protection afforded the industry by the existing escape-action duties would adversely affect the competitive position of the U.S. sheet glass industry and could lead to serious impairment of the economic condition of the sheet glass industry." We conclude here, in terms appropriate to section 301(b)(1), that the domestic sheet-glass industry is being threatened with serious injury.

Shipments of sheet glass by domestic producers (including intra-company shipments) have gradually declined in recent years. Shipments in 1968-70 ranged from 1.3 billion to 1.4 billion pounds annually, while they had varied from 1.4 to 1.6 billion pounds early in the decade. Since the 1969 investigation by the Commission, two domestic sheet-glass plants, which had been devoted mostly to the production of window glass, have been closed, the most recent in September 1971. In addition, another producer in 1970 shut down a sheet-glass line, expanded its float-glass facilities, and now relies entirely on float glass for its requirements of automotive glass.

Employment in the sheet-glass industry has declined markedly in the past decade. The number of production and related workers employed in the manufacture of sheet glass in 1970 was nearly 30 percent smaller than in 1962, the year the escape-action rates of duty were first imposed. Man-hours employed in the production of

sheet glass declined commensurately; aggregate man-hours in 1970 were only about two-thirds those in 1962. Some of the decline in employment in sheet-glass operations is attributable to increased productivity, but much of the decline is the result of the closing of domestic sheet-glass plants.

Price competition in recent years between imported and domestic sheet glass in the U.S. market has been sharp. The domestic producers extensively have had to offer to meet, in whole or in part, lower prices of imported glass in order to try to retain sales. The resultant harmful impact of the sharp price competition on the profits of the domestic producers is evident. The domestic producers' aggregate net operating profits earned on their sheet-glass operations in 1968 and 1969, as well as the ratios of those profits to net sales, averaged only a third of those in 1964, and aggregate profits on sheet-glass operations in 1970 were almost nonexistent. The effect of price competition on window glass was more severe. The aggregate net profits earned by the domestic producers on sales of window glass, and the ratio of those profits to net sales, declined from 1964 to 1967; they remained at a low level in 1968 and 1969, and the producers sustained an aggregate net operating loss in 1970.

Following the Commission's 1969 escape-clause investigation, the President, in addition to continuing the existing escape-action duties, authorized the domestic sheet-glass producers to apply for adjustment assistance under the appropriate provisions of the Trade Expansion Act. ASG Industries and Fourco Glass have applied, and both have been

certified as eligible by the Department of Commerce. The Department recently authorized Government loans of up to $4 million to assist ASG Industries in financing a new float-glass plant. Action on proposals of the Fourco Glass Company is still pending. At this point in time it is too early to evaluate whether the Adjustment Assistance Program has been completely effective with the entire sheet-glass industry.

As the Commission indicated in its recent report on sheet glass under section 351(d)(3), economic conditions were more favorable to the domestic sheet-glass industry in 1971 than in other recent years. As a result of a marked increase in housing starts in 1971 (starts are expected to be some 40 percent greater than in 1970), the consumption of sheet glass in the United States probably approached 2.0 billion pounds--the high side of a channel in which it has remained over the last decade. Imports of sheet glass--at least as evidenced by entries during the first 9 months of 1971--will be about the same or a little smaller in 1971 than in 1970; however, imports of window glass will probably be larger in 1971 than in 1970. Consequently, demand for domestic sheet glass strengthened, domestic production of sheet glass increased, delivery schedules of the domestic producers lengthened, and price discounting in the U.S. market greatly lessened. The announced devaluation of the U.S. dollar in conjunction with changes in currency valuations by other countries may prove to be restrictive of U.S. imports, although the effects of these factors on sheet glass are as yet uncertain and cannot be measured. The

improvements in the domestic picture in 1971, however, have not materially altered the basic economic condition of the industry or substantially changed the serious competitive pressures from imports. We find that the industry is threatened with serious injury.

The major competitive factor threatening the economic health of the domestic producers of sheet glass clearly is increased imports of sheet glass. Over the last decade, despite the imposition of escape-action rates on all or some sheet glass during much of the period, imported glass has maintained a substantial position in the U.S. market. Imported sheet glass supplied from 24 to 32 percent of annual U.S. consumption during that period. In 1970 the import penetration (24 percent) was equal to the share of the domestic consumption supplied by imports during 1959-61, the 3 years immediately preceding the escape-clause action. Although the share supplied by imports undoubtedly was lower in 1971 than in other recent years, the volume of imports that entered nonetheless was highly significant in the marketplace. Imports of window glass in 1970 were equal to 20 percent of domestic consumption, slightly smaller than during the years (1959-61) immediately preceding the escape action.

We recognize that sheet faces market pressure from float glass in part of its market. Such competition is currently limited to heavy sheet glass, but it is anticipated that float glass will eventually offer significant competition to window glass as domestic and foreign capacity to produce float glass increases. As markets are lost to float glass, it will be increasingly difficult for the

domestic producers of sheet glass to achieve profitable operation and they will become increasingly vulnerable to adverse effects of imports of sheet glass.

In our view, additional protection against imports must be afforded the domestic sheet-glass industry if an economically sound domestic industry is to exist. We have found that the imposition of the rates of duty established on June 17, 1962, on ordinary and colored or special sheet glass weighing over 16 ounces, but not over 28 ounces per square foot, and measuring not over 100 united inches (window glass) is necessary to prevent serious injury. These rates are not as high nor as comprehensive in coverage as those recommended by three Commissioners in the 1969 escape-clause case. The competitive pressures from imports on the domestic producers of sheet glass, though still severe, have somewhat eased in recent years. Our recommendation for higher duties on window glass, which accounts for the bulk of the domestic output of sheet glass and which represents the area of most serious import impact from increased imports, should be adequate to prevent serious injury.

Plate and float glass

Since the commercial development of float glass in the early 1960's, float glass is a less expensive method of producing a flat glass that has basically the same properties as plate glass. Today the transition from plate to float glass, at least in the United States, is virtually complete. During the time period covered by the

Commission's earlier investigation of plate and float glass, 1/ plate glass was the dominant, but declining product. Today, float glass has reduced plate glass to a minor role. In 1967 the output of float glass accounted for only 34 percent of the combined domestic production of plate and float glass; during the first half of 1971, float glass accounted for more than 90 percent of the combined output. The conversion from the plate glass process to the decidedly more economical float glass process, which occurred with astonishing speed, is the result of the 12 new float glass lines that have been built in the United States since 1964; additional new float glass lines are currently either under construction or in the advanced planning stage. Since 1964, approximately $171 million have been spent in the United States to build float glass lines (42 percent of it since 1969), and an additional $45 million to modify and improve these facilities.

The conversion from plate glass to float glass has been achieved while the combined output of plate and float glass increased. Domestic production during the first half of 1971 indicates that yearly output should exceed 1 billion square feet (the highest on record), or about 30 percent more than in 1967.

The conversion from plate to float glass has not been without financial benefits. Although the ratio of net operating profit to net sales on plate glass in 1970 was a fifth that in 1966, the ratio on sales of float glass nearly doubled during the same period.

1/ See note 1, p. 9.

The attractiveness of float operations has been sufficient to induce two new firms to enter the industry--Guardian Industries (a non-producer of flat glass) in 1970, and C-E Glass (a rolled and polished wire glass producer) in 1971.

Concurrently with the improvements in the domestic industry, imports of plate and float glass have declined. After reaching a peak of 74 million square feet in 1968, imports have declined annually and in 1970 amounted to 53 million. The decline apparently continued in 1971. The share of the market supplied by imports has also declined. In the first half of 1971, it was about 4 percent, or about half as great as in 1967-68.

Employment in the plate and float glass industry declined 10 percent between 1967 and 1970; employment in the production of float glass doubled while that in plate glass was nearly halved. Considering the dramatic shift from dominance of plate glass to that of float glass during the period, a modest decline in employment could be anticipated, since float glass requires less labor to produce.

Over the long run, the competitive climate for the domestic plate and float glass vis-a-vis the foreign product is vastly improved over that which prevailed in the mid- and late 1960's. On one hand, the consumption of float glass is expected to increase markedly, in both its traditional markets (automotive and commercial construction) and in new uses. The repeal of the Federal excise tax on automobiles, and a tendency to a larger glass area per car (windshields on some G.M. cars, for example, were as much as 30 percent larger in 1971 as they

were in 1970), should greatly stimulate consumption of plate and float glass, some 70 percent of which is ultimately used in automobiles. High levels of housing construction, as at present, are typically followed by increases in commercial construction, in the form of new shopping centers, for example, which utilize significant quantities of plate and float glass. In addition, float glass is moving into uses once served entirely or almost entirely by sheet glass. At the same time, the outlook for imports is less favorable than before the prospective devaluation of the dollar and revaluation of the currency of the major countries from which imports are obtained.

In the light of all these factors, we must conclude that the future of the domestic plate and float industry is much brighter than it appeared to be as nearly as 3 years ago, and that the threat of serious injury from imports does not now exist.

Rolled and polished wire glass

The rolled and polished wire glass industry is facing an uncertain future. The markets for these types of flat glass, unlike those for float glass, have been relatively stagnant in recent years. Substitute products such as acrylic plastics, which are available in rolled glass patterns, have been making inroads in the rolled glass market. Safety legislation has increased the cost of some rolled glass products, particularly shower doors, by requiring that they be tempered which adds to their cost. As a result, substitutes for glass, particularly plastics, are now more price competitive. Also a major use for rolled glass--glass jalousie louvres--has declined

in recent years, with the increased rise of central air conditioning. An off-setting factor is the demand for tempered rolled glass shower doors, which is improving as more States require the use of safety glass in specified areas of residential construction. Polished wire glass is little used in residential construction, and activity in its principal market--nonresidential construction--has been lackadaisical in recent years.

Producers' shipments of rolled and polished wire glass have followed closely the demand for such glass in recent years. Since 1969 shipments of rolled glass have supplied a larger share of the U.S. market, but shipments of polished wire glass have supplied a smaller share.

The U.S. producers have consistently earned profits on sales of rolled and polished wire glass since 1967, although they declined to 3 percent of net sales in 1970.

Since 1968 the combined imports of rolled and polished wire glass have declined; imports of rolled glass in 1970 were only about three-fifths of those in 1967, a year in which imports were smaller than the annual average for the mid-1960's. Polished wire glass imports increased by a third during this period; however, slightly more than 60 percent of the imports consisted of large sizes that are not currently produced in the United States.

Published prices for both domestic rolled and polished wire glass have increased moderately; prices of imported glass have generally kept pace. Price concessions on rolled and polished wire glass by

domestic producers are far less prevalent than they are on sheet glass.

Tempered glass

The tempered glass industry continues to enjoy an expanding market. Like plate and float glass, which serves as much of the raw material, consumption of tempered glass is largely determined by the level of automobile production. With some 70 percent of tempered glass used in the rear and side windows of automobiles, much of the decline in tempered glass consumption in 1970 reflects the 67-day strike against General Motors. By the same token, factors stimulating the manufacture and sale of automobiles--the repeal of the Federal excise tax, for example--necessarily carry over to tempered glass. Current styling trends, side windows which extend below the "belt line" or rear windows which encompass much of the rear deck, are also expected to increase the square footage of tempered glass per car. Consumption of non-automotive tempered glass, for patio doors and other architectural uses, expanded from 56 million square feet in 1967 to 97 million in 1970, and progressed to a rate of 150 million square feet in the first 6 months of 1971. Continued growth in this market is spurred by the high levels of residential construction, and by States' laws and building codes that require safety glazing materials, such as tempered glass, be used in hazardous locations in houses, apartments, and office buildings.

The domestic industry has been quick to respond to the demands of the marketplace. From the end of 1963 until June of 1971, investment in flat glass tempering facilities has totaled $45 million, making them second only to float facilities as recipients of capital expenditure.

Imports have generally accounted for a small share of domestic consumption. Between 1964 and 1968, however, imports were growing at almost a geometric rate, from 1.1 million square feet to 17.0 million square feet. In spite of the rapidly expanding market they had increased their share from less than 1 percent to 5 percent. The rate of growth declined in 1969, however, and imports absolutely declined in 1970. The share of domestic consumption supplied by imports has also stabilized at about 6 percent.

Approximately half of the imports of tempered glass enter from Canada duty-free under the provisions of the Automotive Products Trade Act of 1965 (APTA). These entries include float glass shipped by U.S. producers to their Canadian subsidiaries for tempering. Except for that tempered glass produced by those firms and U.S. subsidiaries able to utilize APTA, foreign tempered glass is largely excluded from participating in the automobile original equipment market which accounts for a large part of U.S. consumption.

In the 1969 investigation on the products here considered, two of us noted an untoward impact of imports on prices, especially on nonautomotive tempered glass. It is our belief that the price

erosion has halted. In 1971 the actual prices realized by domestic producers averaged 41 cents a square foot for a representative size and weight of tempered glass as compared to 39 cents a square foot the year before.

Views of Vice Chairman Parker and Commissioner Young

In the case at hand we have reached a negative determination with respect to all the imported products involved in the investigation. We have found that sheet glass, plate and float glass, rolled and polished wire glass, and tempered glass are not, as a result in major part of trade-agreement concessions, being imported in such increased quantities as to cause, or threaten to cause, serious injury to the domestic industries producing like or directly competitive articles.

With respect to the reasons for our findings on plate and float glass, rolled and polished wire glass, and tempered glass, we concur generally with the views of Chairman Bedell and Commissioners Sutton and Moore. With respect to sheet glass, we have made a different finding than those Commissioners, and the reasons for our finding are set forth below.

Tariff treatment of sheet glass

Following an escape-clause investigation by the Tariff Commission under section 7 of the Trade Agreements Extension Act of 1951, as amended, the President in June 1962 imposed increased rates of duty on U.S. imports of sheet glass. In January 1967, following reports by the Tariff Commission pursuant to section 351(d), the President modified the escape action that he had taken in 1962 by lowering the rates on window glass not over 100 united inches and by eliminating the

escape-action rates on other sheet glass. 1/ In February 1970, after an escape-clause investigation by the Commission under section 301(b)(1) of the Trade Expansion Act of 1962, the President continued the modified escape-action rates on window glass which he had proclaimed in January 1967, but provided for their termination on January 31, 1974, following reductions in three annual stages (the first stage to become effective on January 31, 1972--the day this report is being made). In response to a petition under section 351(d)(3) of the Trade Expansion Act, the Commission advised the President on December 30, 1971, respecting the probable economic effect on the sheet-glass industry if the first of the three annual stages were to take effect. In its report, the Commissioners participating 2/ concluded that--

> ...the termination of a part of the protection afforded the industry by the existing escape-action duties would adversely affect the competitive position of the U.S. sheet-glass industry and could lead to serious impairment of the economic condition of the sheet-glass industry.

1/ The rates of duty following this action with respect to window glass which have continued in effect until the present time have been as follows:

TSUS Item	Rates of Duty
542.31	1.1¢ per lb.
542.33	1.5¢ per lb.
542.35	1.5¢ per lb.
542.71	1.1¢ per lb. plus 2.5% ad val.
542.73	1.5¢ per lb. plus 2.5% ad val.
542.75	1.5¢ per lb. plus 2.5% ad val.

2/ Commissioners Young and Leonard did not participate in the Commission's decision.

Economic status of the sheet-glass industry

In recent years shipments of sheet glass by the domestic producers have generally been maintained at a stable level, and the domestic industry has supplied an increasing share of the U.S. market. In 1970, for example, shipments of sheet glass by U.S. producers amounted to 1.3 billion pounds, which was higher than in 1967 and about equal to shipments in 1966 and 1968. Shipments in the first 9 months of 1971 (the latest available data) were about 15 percent higher than in the corresponding period of 1970--reflecting the strong domestic demand for sheet glass arising from a sharp growth in housing starts. In contrast, U.S. imports of sheet glass have declined steadily since 1968. Imports in that year were at record levels (629 million pounds), substantially above those of any other year; annual imports by 1970 were only two-thirds the volume of those in 1968. Imports in 1971, based on January-September data, were probably at about the same level as in the previous year as contrasted with a 15-percent increase in shipments by the domestic industry.

Recent imports of the different kinds of sheet glass--window, thin, and heavy--have followed much the same pattern as aggregate imports of all sheet glass. Imports of window glass have declined somewhat more sharply than imports of all sheet glass, being 40 percent smaller in 1970 than in 1968. In response to the strong domestic demand, imports of window glass in the first 9 months of 1971 were at an annual rate about 15 percent greater than entries in 1970, but still materially lower than the preceding years. Imports of heavy sheet glass--affected in substantial part by the gradual loss of the automotive market to float

glass in recent years--declined steadily from 1968 through 1971. Imports in the first 9 months of 1971 were at an annual rate of only slightly more than half that in 1968. Imports of thin sheet glass decreased only slightly from 1968 to 1970, but then dropped sharply in the first 9 months of 1971 to an annual rate of only 71 percent of the 1970 level.

As a consequence of the stability in domestic shipments and drop-off in imports of sheet glass in recent years, the domestic producers have accounted for an increasing share of U.S. consumption, with the import share declining. In 1968 U.S. imports of all sheet glass supplied 32 percent of the U.S. market (the largest share in history), while in 1971 imports are estimated to have supplied only 22 percent. For window glass, the largest segment of the sheet-glass market, foreign glass accounted for 31 percent of the U.S. market in 1968, but only 20 percent in 1971.

Currently the market for sheet glass in the United States is booming, and the conditions that affect the economic health of the U.S. sheet-glass producers are more favorable than in other recent years. As we noted earlier, housing starts in 1971 were much larger--some 40 percent--than in 1970, resulting in an increasingly stronger demand for sheet glass (especially window glass). Meanwhile, the changes that have occurred in the valuations of the major currencies of the world, as well as a succession of antidumping actions by the U.S. Government against some of the major foreign suppliers of sheet glass, have enhanced the competitive position of the U.S. producers. The effects of these factors can be observed in the marketplace. Prices of

sheet glass have firmed; price discounting which was prevalent in 1970 has greatly lessened; and the customary price differential by which imported glass undersells U.S. glass has narrowed and in some instances disappeared. Delivery schedules have markedly lengthened from a customary 3-4 week period to 12-14 weeks.

The year 1970 was not a good year for business generally, and it was not a good year for the sheet-glass industry. Aggregate profits were achieved by U.S. producers of sheet glass during the period 1966-69, but in 1970 were almost nil. Window glass operations were in a loss position in 1970; these operations, however, for the years 1966 through 1969 were profitable, even though there were substantial differences between individual companies indicating that there were factors other than imports affecting individual company profitability. Complete profit-and-loss data are not available for 1971. Published reports on the total operations of the two major producers of sheet glass for the first 9 months of 1971 show that sales and net income were equal to, or in excess of, that in 1969. Over the same period, sales by a third producer increased and an annual loss, which had been occurring in operations over an extended period before, was replaced by a growing margin of profit. All other indicators suggest considerable improvements in their sheet- and window-glass operations. Productivity has increased and sales prices have increased. These factors are all indicative of the strengthening position of the sheet-glass industry.

In recent years there has been a major shift to the production of float glass as a result of significant technological developments in the glass producing process. This shift has greatly improved productivity and has lowered the cost of production without adversely affecting

quality. Float glass has therefore almost completely displaced heavy sheet glass in the automotive market. In addition, as capacity expands it is capable of making inroads in other sheet-glass markets. The two largest domestic producers of sheet glass now have extensive float-glass facilities, and another major domestic producer of sheet glass, assisted by financing under the adjustment assistance program of the Trade Expansion Act, is installing float-glass facilities.

As we indicated above, escape-action rates of duty have been applicable to all or part of the U.S. imports of sheet glass for a decade. In reaching our decision in this case, we necessarily have viewed developments in the period when such rates were in effect, and reached our decision in the light of the existence of those rates. In view of the current status of the domestic producers and present market conditions, we have concluded that increased imports of sheet glass have not resulted in serious injury or threat of serious injury to the domestic industry concerned. We therefore have made a negative determination. 1/

1/ Vice Chairman Parker notes that this investigation (No. TEA-I-23) relates, among other things, to the question whether further increases in the modified escape-action rates of duty are warranted under the criteria of section 301(b) of the Trade Expansion Act of 1962 whereas investigation No. TEA-I-EX-7 under section 351(d)(3), on which the Commission reported December 31, 1971, related solely to the probable economic effects of the termination in part of the modified escape-action rates scheduled to become effective January 31, 1972.

Additional Views of Commissioner Leonard

My determination in the instant investigation is in the negative. I concur generally with the reasons given by Chairman Bedell and Commissioners Sutton and Moore in support of their negative determination on plate and float, rolled and polished wire, and tempered glass. And I also support in the main the views of Vice Chairman Parker and Commissioner Young in behalf of their negative determination on sheet glass.

The instant investigation covers the same articles as were covered by an investigation conducted by the Commission in 1969. 1/ I am the only member of the present Commission who made a negative determination on all the aforementioned categories of glass in the 1969 investigation. Certainly nothing has occurred since 1969 to require a change from the negative to the affirmative. Rather, as outlined in the preceding views of my colleagues and as detailed in the remainder of this report, conditions have improved for the United States industries involved, and today they are less able to meet the criteria of section 301(b) of the Trade Expansion Act of 1962 (TEA) than they were in 1969. That conclusion must be shared by the other members of the Commission who participated in 1969, for they have shifted from affirmative to negative determinations on all categories of

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1/ Flat Glass and Tempered Glass: Report to the President on Investigation No. TEA-I-15 under Section 301(b)(1) of the Trade Expansion Act of 1962, TC Publication 310, December 1969.

glass, except sheet, and even on sheet they have modified their 1969 finding of actual serious injury to a finding now of a threat of serious injury.

The Commission today has unanimously determined in the negative on all of the glass under investigation, save sheet, and therefore foreclosed further action at this time under the TEA for the plate and float, rolled and polished wire, and tempered glass industries. The same is not true for sheet glass and therefore further discussion is merited.

As there is today, there was a three-to-three division in the Commission in 1969 as to whether the industry producing sheet glass in the United States qualified under the TEA for relief. In early 1970, the President, under the authority of section 330(d)(1) of the Tariff Act of 1930, chose the affirmative finding of three Commissioners as the finding of the Commission with respect to whether the sheet glass industry qualified for relief under the TEA. He proclaimed that modified escape action rates then in effect on certain window glass (which as will be shown later is the major part, but not all, of sheet glass production) should remain in effect until January 31, 1972, when the first stage in reducing the rates to their trade-agreement concession level should take place. In addition, the President proclaimed that firms and workers in the sheet glass industry could request certifications of eligibility to apply for adjustment assistance under the TEA.

Further, the action of the President in 1970 permitted another provision of the TEA, section 351(d)(3), to become operative. Under section 351(d)(3), a petition was filed in 1971 on behalf of the sheet glass industry requesting the Commission to advise the President prior to the termination of the modified escape action rates as to the probable economic effect on the industry of such termination. The Commission conducted the necessary investigation, and those Commissioners participating 1/ advised the President that in their view the termination of the escape-action rates of duty "would adversely affect the competitive position of the U.S. sheet glass industry and could lead to serious impairment of the economic condition of the sheet glass industry." 2/

That advice while cloaked with data and analyses could also have been a hedge on the determination that would be forthcoming within a month in the so-called 301(b)(1) investigation (the instant investigation). When the 351(d)(3) investigation report was made by the Commission in December 1971, the 6-month instant investigation was well on its way to completion, and the Commissioners participating in the 351(d)(3) report naturally did not want to say anything in the earlier report which would limit their options in the later report. It might be argued, however, that by in effect recommending

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1/ Commissioner Young and I did not participate.

2/ Sheet Glass (Blown or Drawn Flat Glass); Report to the President on Investigation No. TEA-I-EX-7 under Section 351(d)(3) of the Trade Expansion Act of 1962, TC Publication No. 449, December 1971, at p. 11.

Thus, the evenly divided vote in the Commission in the escape-clause investigation of 1969, itself not the first step in the protection of the United States sheet glass industry, permitted the President's retention of escape action rates, which then provided the means for the Commission's position in December 1971, and that latter position perhaps as much as anything influenced the three-to-three split in today's report.

It is now up to the President once again to resolve the Commission's tie. He can resolve it by adding to the snow ball of protection for an industry that by the very nature of its limited membership seems to be protecting itself quite well or he can reverse the domino syndrome and in effect declare a halt to government aid to the sheet glass industry.

against a termination of the modified escape action rates on certain window glass, the participating Commissioners did limit their options, that they prevented themselves from determining in the negative on window (indeed, on all sheet) glass in the instant investigation.

That argument can be countered, though, for section 351(d)(3) of the TEA merely requires the Commission's advice as to the probable economic effect on an industry of the termination of existing rates of duty, while the standards of 301(b) of the TEA are different and more numerous. The determination under 301(b), as in the present case, must be that: (1) An article is being imported into the United States in increased quantities; (2) the increased imports are as a result in major part of concessions granted under trade agreements; (3) the domestic industry producing an article like or directly competitive with the imported article is being seriously injured or threatened with serious injury; and (4) the increased imports (in major part the result of trade-agreement concessions) have been the major factor causing or threatening to cause the serious injury.

It is possible to give the advice under 351(d)(3) that the participating Commissioners gave in December 1971, and still to make a negative determination in a 301(b) report on the same industry. Indeed, Vice Chairman Parker has done just that. But certainly the tendency is, once a step is taken down the road of offering protection to an industry, to take the next step along the same road until one has marched so far as to make it most difficult to change directions and retreat.

INFORMATION OBTAINED IN THE INVESTIGATION

Description of Products

The imported products covered by this report are drawn or blown sheet glass, in rectangles, weighing over 4 ounces per square foot; ground or polished plate and float glass, in rectangles; cast or rolled glass; polished wire glass; and toughened (specially tempered) glass made of flat glass. 1/ Sheet, plate, float, rolled, and polished wire glass collectively will be referred to hereafter as flat glass, and toughened (specially tempered) glass, as tempered glass.

Sheet glass

Sheet glass is a transparent flat glass having a smooth, fire-polished surface made by machine drawing. 2/ The drawing process leaves faint ripples on the surface of the glass which distort, to varying degrees, objects either viewed through, or reflected in, the glass. Sheet glass may be either clear or colored; however, virtually all domestic production and imports consist of the clear. It is commonly divided into three thickness (weight) classifications--thin sheet glass, window glass, and heavy sheet glass.

1/ Tempered glass can be made not only from the flat glass covered by this investigation but also from flat glass that has been cut to nonrectangular shapes or that has been subject to bending, curving, beveling, edging, notching, drilling, chipping, sanding, embossing, engraving, etching, coating, staining, enameling, painting, decorating, or any combination thereof.

2/ Sheet glass is identified in the Tariff Schedules of the United States (TSUS) as "drawn or blown flat glass, in rectangles, weighing over 4 ounces per square foot." All sheet glass today is drawn; blown flat glass is now obsolete.

Thin sheet glass is that weighing over 4 ounces but not over 16 ounces per square foot. The lightest weights are used for making microscope slides, mounting photographic transparencies, and thin picture-frame glass. The heavier weights (over 12 ounces per square foot) are used in picture frames, for storm windows, and for laminating.

Window glass is that weighing over 16 ounces but not over 28 ounces per square foot. It is by far the most important sheet glass category and accounts for about 68 percent of domestic production of all sheet glass. It is the common glazing material for residential construction and serves, among other uses, in bookcases, and in the fabrication of laminated glass (other than for windshields) and double-glazed insulating units. Window glass is generally either single strength, weighing 18 or 19 ounces per square foot, or double strength weighing 24 or 26 ounces per square foot; the two weights in each strength are, for the most part, used interchangeably. In thickness, single-strength glass is about 3/32 inch, and double strength about 1/8 inch. Single-strength glass accounts for about 70 percent of the consumption of window glass.

Nearly all window glass is of the dimensions "100 united inches or less"; 1/ beyond these dimensions, window glass does not provide the rigidity generally needed to avoid breakage during handling or from high wind loads.

1/ The number of "united inches" is the sum of the length and width of a rectangle of sheet glass.

Heavy sheet glass is that weighing over 28 ounces per square foot. It is commonly used for tempering and for glazing large openings such as patio doors. Its use (after tempering) in automobile side and rear windows, once substantial, has now been largely replaced by float glass (described below). Heavy sheet glass is commonly used in thicknesses of 5/32 inch, 3/16 inch, and 7/32 inch.

Plate and float glass

Plate glass is rolled glass that has been ground and polished to make the glass transparent and render its surfaces virtually plane and parallel, thereby eliminating most of the distortion found, in various degrees, in sheet glass. Float glass is transparent flat glass having optical qualities virtually the same as those of plate glass, but is obtained by floating a layer of molten glass on molten tin rather than by grinding and polishing.

Plate and float glass, which are generally interchangeable, are used principally to make laminated windshields and tempered side and rear windows of motor vehicles, to glaze large openings such as store display windows and so-called curtain walls, and to make high-quality mirrors.

To meet its many uses, plate glass is made in many thicknesses ranging from 1/8 inch to 1-1/4 inches. At the present time float glass is produced principally in 1/8-, 3/16-, and 1/4-inch thicknesses.

Rolled glass

Rolled (cast) glass, is flat glass the surface of which has been impressed with designs or irregularities. The imprint may be in the form of patterns--e.g., fluted, figured, pebbled, crosshatched, etc., or may be simply rough textured, so that while light may be transmitted, the glass is not transparent. While design may be impressed on both sides, the bulk of rolled glass used in the United States is impressed on only one side.

Rolled glass is produced in thicknesses ranging from about 1/8 inch to 3/8 inch. It is used for decorative as well as utilitarian purposes, as in skylights, office partitions, bath and shower enclosures, and jalousies.

Rolled glass may be colored; as such, it is known as cathedral, opalescent, or ornamental glass. It is produced primarily for decorative use in light fixtures, church windows, and for "stained glass" effects.

Rough plate-glass blanks are sometimes sold before grinding and polishing without further processing as rolled glass. The imprint on such glass occurs as an intermediate stage in plate-glass manufacture, not as an end of production in itself. Rough plate-glass blanks are much larger than the sheets produced by rolled-glass manufacturers, and are frequently used for special architectural effects.

Polished wire glass

Rolled glass may contain embedded wire mesh or strands. The wire holds the glass in place if the glass is broken. It stays in the sash, offering protection against forced entry and resistance to fire under circumstances that would destroy nonwired glass.

Polished wire glass is glass which has been ground and polished to transparency, and which has the optical characteristics of plate glass (save for the visible mesh or strands) and the safety features noted above. Polished wire glass is most commonly used in 1/4-inch thickness.

Tempered glass

Tempered glass is a type of safety glass made by specially processing flat glass to increase its strength. When broken, tempered glass crumbles harmlessly instead of shattering.

Tempered glass cannot be cut or drilled without being destroyed nor can it be bent or otherwise altered in form without losing its temper. All tempered glass products **must** be cut to size and formed before tempering.

Tempered glass is used principally for glazing motor-vehicle windows other than windshields. It is used extensively in homes for interior and exterior doors, shower enclosures, and large fixed glass panels. Tempered glass is also used in miscellaneous industrial applications.

Production Processes

Except for some rolled glass, flat glass is made today on continuous production lines. Once production is started, it continues around the clock until interrupted by breakdown or shutdown. Flat-glass production lines cannot be shifted from one type of flat glass to another; 1/ a sheet-glass line, for example, cannot be used to produce plate, float, or rolled glass.

The raw materials (batch) used to make all flat glass are essentially the same--silica sand, limestone, soda ash, salt cake, and waste glass of the same type to be made. The batch is fed into and moves through the furnace; it emerges as molten glass from the working compartment. The batch is subjected to temperatures of about 2900° F, which is sufficient to melt the raw materials into a liquid homogeneous mass. Uniformity of the raw materials batch as well as in the temperature of the molten glass are factors affecting the quality of the finished product. A decision to shut down a furnace is decisive as the glass remaining in the furnace solidifies and the furnace must be rebuilt before returning to operation.

Sheet glass

Sheet glass is drawn from the working compartment of the furnace as a continuous sheet of plastic glass. The speed at which it is drawn determines the thickness of the sheet. Several lines of

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1/ An exception is that rolled glass in the form of rough plate glass blanks is produced on a plate-glass line.

drawing equipment may be supplied by single furnace. After drawing, the sheet is either bent horizontally, or continues vertically, into an annealing lehr where internal stresses are removed and the glass is gradually cooled. After passing through the lehr the glass is inspected, cut to size by automatic equipment, and packaged for shipment or inventory. The drawing process leaves an unevenness of surface which distorts objects seen through or reflected in the sheet glass.

Plate glass

Plate glass is pulled from the working compartment of the furnace by large, water-cooled rollers. After emergence from the annealing lehr, the surfaces are ground plane and parallel and then polished by elaborate banks of automatic equipment.

Grinding and polishing give plate glass its distinguishing characteristic, and result in a lustrous, distortion-free product.

Float glass

In the float process, the molten glass flows from the furnace onto a bath of molten tin. The floating of one liquid on another results in a glass whose surfaces are plane and parallel without mechanical grinding and polishing. Float technology is particularly attractive since it eliminates an entire production stage but still turns out the same high-quality product. The technology has been licensed by Pilkington Brothers (England), the owner of the patent, to producers in a dozen countries. A shift from the production of plate glass to that of float glass has been in progress since 1962,

and float glass now accounts for the bulk of the combined total. The natural thickness of float glass is 1/4 inch; if thinner thicknesses are desired, the ribbon of glass must be stretched as it passes over the molten tin.

Rolled glass

Rolled glass is pulled from the working compartment as a continuous ribbon and passes between two rollers. The rollers, one or both of which have a patterned or textured surface, impress the design or irregularities on the surface of the glass before it solidifies. The glass then passes through an annealing lehr where internal stresses are removed, and, upon emergence from the lehr, it is inspected, cut to size, packaged, and prepared for shipment or inventory.

Some colored or special rolled glass is produced by an intermittent process whereby molten glass is withdrawn from a furnace by large iron ladles and poured or cast (hence, the term "cast glass") onto a flat iron table. A roller then passes over the table and a design is impressed into the glass usually by configurations on the surface of the table rather than on the roller. This method is used where numerous designs or colors are required, but it is unsuited for mass production.

Wire glass

In wire-glass production the wire is inserted into the molten glass automatically as it emerges from the tank and before it passes between the rollers. Polished wire glass is then ground and polished in essentially the same manner as is plate glass.

Tempered glass

Virtually all tempering of flat glass is done through a thermal process. The glass is heated to just below its softening point -- it must be rigid enough to avoid serious deformation yet fluid enough to relax internal stress -- then rapidly quenched by jets of air. With the sudden cooling, compression of the outer surface forms a continuous envelope of stress around a central core. The resulting product is 3 to 5 times stronger than ordinary glass of the same thickness.

Extent of Competition Between Types of Flat Glass

In recent years direct competition between the various types of flat glass has occurred in several uses. Consumers of flat glass generally are unable to distinguish between plate and float glass, and, since float glass is considerably cheaper to produce than plate, float glass has already largely displaced plate from the principal markets. Plate, float, and sheet glass have all been used in automobile side and rear windows, mirrors, table tops, and desk covers, although, by mid-1971, float glass had largely captured the market for automobile glass. The selection of one type of flat

glass over another is based on both quality and price; price is the predominant factor in many instances, particularly where small surfaces are involved. Thus far, most of the competition of plate and float glass with sheet glass has affected heavy sheet glass rather than window glass. Float glass of 1/8-inch thickness, for example, is comparable in weight to double-strength window glass, but this thin float glass is being used in laminated automobile windshields rather than in competition with double-strength window glass. Through mid-1971, the substitution of plate or float for double-strength window glass had been negligible. Nevertheless, it is technically feasible to produce float glass as thin as single-strength window glass; opinion in the flat-glass market is divided as to whether float glass will ultimately displace window glass as it has largely displaced plate glass and heavy sheet glass.

Although tempered glass has replaced laminated glass in automobile side and rear windows, the substitution of tempered glass for laminated glass has not altered the aggregate demand for flat glass, rather it has changed the demand for certain thicknesses and types of flat glass.

U.S. Tariff Treatment

Current rates of duty

The current U.S. most-favored-nation (MFN) rates of duty 1/ applicable to imports of flat glass other than sheet glass and to imports of tempered glass are the final staged rates negotiated in the recent Kennedy Round trade conference. These rates were placed in effect on January 1, 1972.

The current rates applicable to sheet glass (except that weighing over 16 ounces but not over 28 ounces per square foot (window glass) and measuring not over 100 united inches) are trade-agreement rates restored by the President on January 11, 1967. Sheet glass weighing over 16 ounces but not over 28 ounces per square foot and measuring not over 100 united inches (which generally accounts for more than half of the U.S. consumption of sheet glass) is dutiable at modified escape-action rates initially proclaimed by the President on January 11, 1967. Presidential Proclamation No. 3967 of February 27, 1970 provides that the modified escape-action rates will be terminated in three annual stages, the first to take place on January 31, 1972.

Sheet glass.--The rates of duty currently applicable to ordinary sheet glass imported from countries eligible to receive MFN tariff treatment are specific rates that range from 0.7 cent to 1.5 cents

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1/ Glass imported from countries or areas designated as Communist dominated or controlled is subject to higher rates of duty (shown in the "statutory rate" column of tables 1 and 2) than glass imported from countries eligible for MFN tariff treatment.

per pound. The average ad valorem equivalents of the individual rates, based on imports in 1970, range from 2.3 to 23.3 percent (table 2). Imports of colored or special sheet glass weighing over 16 ounces per square foot, which have constituted a minor part of U.S. imports of sheet glass in recent years, are subject to the same specific rates as ordinary sheet glass plus a duty of 2.5 percent ad valorem. 1/ The average ad valorem equivalent of the modified escape-action rates applicable to ordinary sheet glass weighing over 16 ounces but not over 28 ounces per square foot and measuring not over 100 united inches range from 17.9 to 23.3 percent; the average ad valorem equivalent of the modified escape-action rates applicable to colored or special glass of the same weights and surface areas range from 4.0 to 9.6 percent.

Plate and float glass.--Ordinary plate and float glass not containing wire netting and measuring not over 15/32 inch in thickness is dutiable at one of three specific rates, 1.7 cents, 2.5 cents, or 2.8 cents per square foot, depending on the surface area (table 1). The average ad valorem equivalent of the individual rates, based on imports in 1970, range from 4.5 percent to 7.1 percent. Imports of colored or special glass measuring not over 15/32 inch in thickness is dutiable at one of three specific rates, 1.7 cents, 2.5 cents, or 2.8 cents per square foot, depending on the surface area (table 1).

1/ Colored or special sheet glass weighing not over 16 ounces per square foot is subject to a higher specific rate of duty than ordinary sheet glass of comparable thickness; it is not subject to any additional ad valorem rate.

The average ad valorem equivalent of the individual rates, based on imports in 1970, range from 4.5 percent to 7.1 percent. Imports of colored or special glass measuring not over 15/32 inch in thickness (including glass containing wire netting) are subject to the same rates as ordinary plate and float glass plus 1 percent ad valorem. Plate and float glass measuring over 15/32 inch in thickness is dutiable at 10.5 percent ad valorem for ordinary glass (excluding that containing wire netting), and 11.5 percent ad valorem for colored or special glass.

Rolled glass.--Ordinary rolled glass is dutiable at 0.3 cent per pound; colored or special rolled glass, except opaque and measuring over 15/64 inch in thickness, is subject to the same specific duty plus 1 percent ad valorem (table 1). Based on imports in 1970, the average ad valorem equivalent of the rate on ordinary rolled glass was 4.4 percent, and the equivalent of the rate on colored or special glass was 3.1 percent. Opaque rolled glass measuring over 15/64 inch in thickness is dutiable at 0.6 cent per pound; the average ad valorem equivalent of this rate was 4.7 percent.

Polished wire glass.--Ordinary polished wire glass, identified in the tariff schedules as ordinary plate glass containing wire netting, is dutiable at 3.8 cents per square foot. The average ad valorem equivalent of this rate, based on imports in 1970, is 4.0 percent (table 1).

Tempered glass.--Imports of tempered glass, except Canadian articles that are original motor-vehicle equipment, are dutiable at 11 percent ad valorem (table 1). Imports of Canadian tempered glass for use as original equipment in the manufacture of motor vehicles are duty free pursuant to the provisions of the Automotive Products Trade Act of 1965.

Trade-agreement concessions

The rates of duty applicable to flat glass and tempered glass were subject to several tariff concessions, beginning with concessions on plate glass in the Belgium trade agreement in 1935 and concluding with the Kennedy Round Negotiations in 1967.

Sheet glass.--The statutory rates established by the Tariff Act of 1930 ranged from 1-7/8 cents per pound to 3-3/4 cents per pound depending on the surface area of the piece of glass. In 1932 these rates were reduced by 25 percent by Presidential proclamation pursuant to section 336 of that act. The section 336 rates were in turn reduced by approximately 30 percent from April 16, 1938 to April 21, 1939 pursuant to a trade agreement with Czechoslovakia. Under the GATT, effective January 1, 1948, the rates established under the Czechoslovakian agreement (with minor exceptions) were reestablished. The rates were reduced by an average of about 24 percent effective June 6, 1951, and by an average of 13 percent in three annual stages, the final stage becoming effective June 30, 1958.

In June 1962, pursuant to escape-clause procedure, the President increased the rates of duty on imported sheet glass. The percentage increase varied from 71 to 150 percent depending on thickness and surface area, but on the average the rates were approximately doubled. In January 1967 the President restored the concession rates of duty on thin sheet glass, heavy sheet glass, and window glass measuring over 100 united inches. The rates of duty on window glass measuring not over 100 united inches were reduced an average of 16 percent, but the escape-action increases were not completely eliminated. They are now scheduled to be eliminated in 3 annual stages, the first of which is to take place on January 31, 1972, unless the President acts to prevent it. The first stage would result in a reduction from 21 percent to 19 percent in the ad valorem equivalent of the rates of duty on window glass measuring not over 100 united inches.

Plate and float glass. 1/--Ordinary plate glass not containing wire netting was originally dutiable under the Tariff Act of 1930 at various specific rates, depending on surface area, ranging from 12-1/2 cents to 19-3/4 cents per square foot; such glass measuring 1/2 inch or more in thickness was also subject to a minimum rate of 50 percent ad valorem. The specific rates were reduced by approximately 33 percent in the 1935 trade agreement with Belgium, and by 50 percent, effective January 1, 1948 under the GATT. In 1956-58 these rates were reduced by 15 percent in three annual stages; the final stage

1/ Prior to Aug. 31, 1963, the effective date of the TSUS, float glass was classified as sheet glass for tariff purposes; it is classified with plate glass under the TSUS. Float glass first became an article of commerce in 1960.

became effective June 30, 1958. The minimum ad valorem rate applicable to plate glass 1/2 inch or more in thickness was reduced from 50 percent to 25 percent ad valorem, effective January 1, 1948, and was further reduced in three stages during 1956-58 to 21 percent, the final stage becoming effective June 30, 1958.

Colored or special flat glass, except rolled opaque glass measuring over 15/64 inch in thickness, was originally subject to an additional duty of 5 percent ad valorem under the Tariff Act of 1930; this duty was reduced to 2-1/2 percent ad valorem effective June 6, 1951.

During the Kennedy Round trade conferences, the rates of duty applicable to plate and float glass established in 1963 by the TSUS were reduced by approximately 50 percent.

Rolled glass.--The 1930 statutory rate of 1.5 cents per pound on ordinary rolled glass was reduced by 50 percent to 0.75 cent per pound, effective January 1, 1948, under the General Agreement on Tariffs and Trade (GATT). Later this rate was further reduced by 15 percent to 0.625 cent per pound in three annual stages; the final stage became effective on June 30, 1958. Colored or special opaque rolled glass measuring over 15/64 inch in thickness was dutiable at the rates applicable to plate glass.

The rates of duties applicable to rolled glass that were established by the TSUS were reduced approximately 50 percent in the Kennedy Round trade negotiations.

Polished wire glass.--The 1930 statutory rates on ordinary plate glass containing wire netting ranged from 15 cents to 23 cents per square foot. These rates were first reduced by approximately 33 percent in the trade agreement with Belgium, effective May 1, 1935. They were further reduced under the GATT by 50 percent, effective January 1, 1948, and by 20 percent in two stages during 1963-64 (the final stage becoming effective January 1, 1964). The single specific rate of duty of 6.8 cents per square foot on polished wire glass was reduced to 3.8 cents per square foot as a result of a concession granted during the Kennedy Round trade conference.

Tempered glass.--Tempered glass was not specifically provided for in the U.S. tariff prior to the establishment of the TSUS; however, tariff concessions were granted on the provisions under which tempered glass was classified. Ordinary tempered glass was originally dutiable at 50 percent ad valorem under the Tariff Act of 1930; the rate was reduced to 40 percent ad valorem in 1948, to 25 percent in 1951, and in three annual stages to 21 percent, effective June 30, 1958. Colored or special tempered glass was reduced to 30 percent from the 1930 statutory rate of 60 percent, effective April 21, 1948, for such glass valued over $1.66-2/3 each, and September 10, 1955, for such glass valued not over $1.66-2/3 each. The rates on the ordinary and the colored were consolidated into one rate under the TSUS--22 percent ad valorem, effective August 31, 1963. The current 11 percent ad valorem rate resulted from a concession granted during the Kennedy Round trade conference.

Automotive Products Trade Act of 1965 (APTA).--Tempered glass is the only type of glass covered by this investigation that comes within the scope of the Automotive Products Trade Act of 1965. Since January 19, 1965, Canadian tempered glass that is a fabricated component intended for use as original equipment in the manufacture in the United States of a motor vehicle has been granted duty-free entry.

Administrative Action

Import surcharge

From August 16 until December 20, 1971, the President imposed a temporary surcharge of 10 percent ad valorem, as an emergency balance of payments measure. The surcharge applied to virtually all imports dutiable at trade agreement rates, except those subject to quantitative restrictions. If, however, the surcharge would have caused the total duty on an article to exceed the statutory rate, the statutory rate applied.

Where specific duties were involved, the unit value of the imported article determined whether the full 10 percent, or the statutory rate applied. In general, on ordinary window glass up to 60 united inches, and on colored window glass up to 100 united inches, the statutory rate applied; on all other imports of flat glass and tempered glass the full surcharge applied.

Currency revaluation

Concurrently with the imposition of the surcharge, the President suspended gold payments by the United States. The consequent depreciation of the dollar in terms of foreign currencies had the effect, by December 1971, of increasing the price of articles stated in Japanese yen by 11 percent; those stated in Belgian francs by 9 percent; those in D-marks by 3 percent; 1/ those in pounds sterling by 3 percent; those in Italian lira by 2 percent; and those in French francs (free) by 2 percent. On December 18, 1971, the President proposed that the Congress raise the price of gold to $38 an ounce.

Special dumping duties

During 1971, the Tariff Commission found that an industry is being injured, within the meaning of the Antidumping Act of 1921, as amended, by reason of imports at less than fair value of clear sheet and clear plate and float glass from Japan (April 7, 1971, 3-1), clear sheet glass from Taiwan (July 21, 1971, 2-2), tempered glass from Japan (August 3, 1971, 2-2), and clear window glass from Italy and clear heavy sheet glass from Italy, France, and West Germany (November 3, 1971, 3-3). Accordingly, imports of the affected glass from the specified countries are liable to antidumping duties. They comprise 40 percent of the imports of plate and float glass and 25 to 30 percent of sheet glass, and 25 percent of those of tempered glass.

1/ West Germany permitted the D-mark to float against the dollar in May 1971. Since then, the D-mark has been revalued upward by 12 percent.

Adjustment assistance

The President, in his proclamation of February 1970 extending the period for increased rates of duty on sheet glass, provided that firms in the sheet glass industry might request the Secretary of Commerce for certification of eligibility to apply for adjustment assistance under Chapter 2 of Title III of the Trade Expansion Act of 1962 and that groups of workers might request the Secretary of Labor for certification of eligibility to apply for adjustment assistance under Chapter 3 of Title III of the act.

Two firms, ASG Industries, on September 22, 1970, and Fourco on July 6, 1971, requested the Secretary of Commerce for certification of eligibility for adjustment assistance under the foregoing authority. The Department of Commerce in December 1971 authorized a Government loan of up to $4 million to ASG Industries to help finance the construction of its initial float glass plant in Greenland, Tenn., the site of ASG's plate-glass facility. Fourco has received a certificate of eligibility to apply for adjustment assistance but has not yet submitted adjustment proposals. 1/

Certification of eligibility to apply for adjustment assistance was issued by the Secretary of Labor to about 1,500 workers. Additional information on the circumstances of this certification is included in the section on sheet glass employment.

1/ Counsel for Fourco indicated that the company would submit its proposal before the end of January 1972.

U.S. Producers

Firms involved

Flat glass and tempered glass, combined, are produced in the United States by 22 companies. 1/ Ten of the 22 companies operate glass melting furnaces of substantial size with which to produce raw glass. U.S. production of the products under consideration is highly concentrated. The combined production of 4 of these companies--PPG Industries, Ford Motor Co., Libbey-Owens-Ford, and ASG Industries--accounts for over 87 percent of the U.S. output of sheet glass, nearly 100 percent of the plate glass, and nearly 50 percent of the rolled glass; three of the 4 companies account for 99 percent of the total production of float glass. Tempered glass is produced by 19 of the 22 companies; three producers of flat glass, however, account for over 75 percent of the total U.S. output of tempered glass.

The share of the U.S. shipments (including intracompany transfers) in 1970 of the various types of flat glass and of tempered glass accounted for by each company is shown in the following table.

1/ A decline of 7 in the number of companies between 1968 and 1970 is the result of mergers and acquisitions.

* * * * * * * *

Overall, three firms largely dominate U.S. production of flat glass. Two--PPG Industries, Inc., and Libbey-Owens-Ford Co.--are large multiproduct firms producing both a wide range of flat-glass products (sheet, plate, float, and rolled glass, and tempered glass) and other products. These two concerns participate in foreign production of flat glass through arrangements ranging from process licensing agreements to co-ownership with foreign companies of plants that produce flat glass. The third firm--Ford Motor Co.--produces float and tempered glass primarily for use in its production of automotive vehicles, but secondarily for sale to the trade.

Two smaller firms--ASG Industries, Inc. and Fourco Glass Co.--produce substantial quantities of flat glass. ASG produces plate, sheet, and rolled glass, as well as tempered glass. Fourco's production is limited almost exclusively to sheet glass.

Two firms--Guardian Industries, Inc. and C-E Glass--commenced production of float glass in 1970 and 1971, respectively. Guardian Industries is a substantial processor of laminated and tempered glass; C-E Glass is a major producer of rolled glass, and also a substantial fabricator of tempered glass. The three remaining producers of flat glass manufacture rolled glass, principally colored for decorative use.

The remaining 12 firms do not produce flat glass but produce the tempered glass covered in this investigation. One of these firms is a motor-vehicle manufacturer (Chrysler Corp.) producing tempered glass almost exclusively for its own use, while the remainder produce tempered glass for uses other than automotive.

A few firms not mentioned above produce very small quantities of flat glass for their own use. A few others purchase small quantities of rough flat glass and process it, usually by grinding and polishing.

Plants involved

On September 30, 1971, U.S. producers were operating 11 plants producing sheet glass, 1 plant producing plate glass, 8 plants that produce float glass, and 3 plants producing both plate and float glass. Rolled glass was being produced in 7 plants, 4 of which account for the great bulk of production. Small quantities of rolled glass (rough plate-glass blanks) were also produced in some of the plate glass plants.

Since 1964, 10 plate-glass lines and 2 sheet-glass lines have been dismantled in the United States. Twelve new float-glass lines have been built; 7 have been constructed in the same locations as former plate-glass lines, 1 in the same location as a rolled-glass line, and 1 in the same location as a sheet-glass line. Two float-glass lines are currently under construction. In 1967 a new rolled-glass plant was established by a non-glass-producing firm.

On September 30, 1971, tempered flat glass was produced in 49 plants in the United States. Twenty-seven of these plants (12 of them flat-glass plants) accounted for over 90 percent of annual production, and were owned by U.S. flat-glass producers.

Plant location

The location of flat-glass-producing plants is determined by a number of factors. Some of the plants are located adjacent to the principal manufacturing industries they serve, while others are advantageously located to serve a particular geographical area. Considerations such as local wage rates, fuel costs, access to transportation facilities, and availability of raw materials help determine the actual site within an area.

The following tabulation shows the number and distribution of flat-glass and tempered-glass production facilities in the United States on September 30, 1971.

Number of flat-glass and tempered-glass production facilities in the United States, by States, Sept. 30, 1971

State	Flat glass					Tempered glass
	Sheet	Plate	Float	Rolled	Total	
Arkansas	1	-	-	-	1	1
California	1	-	1	1	3	11
Colorado	-	-	-	-	-	1
Florida	-	-	-	-	-	4
Georgia	-	-	-	-	-	1
Illinois	1	-	1	-	2	5
Indiana	-	-	-	1	1	1
Maryland	-	1	1	-	1/ 1	-
Michigan	-	-	2	-	2	4
Missouri	-	1	1	1	1/ 2	1
New Jersey	-	-	-	-	-	1
New York	-	-	-	-	-	2
Ohio	1	1	2	1	1/ 4	8
Oklahoma	2	-	-	-	2	-
Pennsylvania	1	1	3	-	1/ 4	3
Tennessee	-	1	1	2	4	2
Texas	-	-	-	-	-	1
Virginia	-	-	-	-	-	1
West Virginia	4	-	-	1	5	2
Total	11	5	12	7	31	49

1/ Plate and float glass produced in the same plant.

Capital Investments

U.S. glass producers have expended $313 million since the end of 1963 on capital investments in flat-glass and tempered-glass facilities. Expenditures for new production facilities (largely float-glass plants) accounted for 64 percent of the total; the remainder was spent to improve or maintain existing production facilities. Of the total expenditures, 69 percent was devoted to float-glass facilities, 14 percent to tempered-glass facilities, 11 percent to sheet-glass facilities, 4 percent to plate-glass facilities, and 1 percent to rolled glass facilities. The aggregate value of new investment by the U.S. producers of flat glass and tempered glass in the period January 1964 through June 1971 is shown in the following table.

Flat glass and tempered glass: New investment by U.S. producers, January 1964-June 1971

(In thousands of dollars)

Item	Flat glass				Tempered glass	Total
	Sheet	Plate	Float	Rolled		
Modification of existing facilities	15,892	11,714	45,272	2,836	37,782	113,496
New facilities	19,272	929	171,292	1,000	7,305	199,798
Total	35,164	12,643	216,564	3,836	45,087	313,294

The building of float-glass production facilities during this period constituted the most important technological change in the U.S. flat-glass industry since the 1920's. During 1964-June, 1971, $171 million

was expended to build new float-glass lines (42 percent of it since January 1969) and $45 million to modify these facilities. Major sums were also expended to build a sheet-glass plant, a rolled-glass plant, and 12 tempered-glass plants, and to expand some of the newly built tempered-glass plants.

Distribution Channels

The marketing of flat and tempered glass in the United States, like that of many products, is characterized by the use of multiple distribution channels. The main channels through which flat glass, both domestic and imported, is distributed are as follows--listed in the order of their importance:

1. Directly from domestic or foreign producers to manufacturers, fabricators, processors, and glazing contractors.

2. Through independent glass distributors who, in turn, serve manufacturers, fabricators, processors, glazing contractors, jobbers, and retailers. One domestic producer operates a merchandising system which markets at all distribution levels, from that of the independent glass distributor to that of the retailer.

Tempered glass is distributed through each of the main channels listed above. However, tempered automotive glass for original equipment, which accounts for a major share of the tempered-glass market, is sold directly to motor-vehicle manufacturers at negotiated prices. Some tempered automotive replacement glass is distributed by some of the major motor-vehicle manufacturers through their systems of franchised new-car dealers. Part of the U.S. output of flat and tempered glass is captive. Each of the major domestic producers of flat glass fab-

ricates or processes some of the flat glass it produces into other products; the great bulk of the flat glass produced by the Ford Motor Co. is fabricated into automotive glass for use as original or replacement equipment in motor vehicles manufactured by that company.

The U.S. producers of flat glass sell glass to so-called recognized factory buyers--independent glass distributors, fabricators (such as sash-and-door and jalousie manufacturers), processors (such as temperers, laminators, and mirror manufacturers), and glazing contractors. The recognized factory buyers are the only concerns that can buy flat glass directly from the factory. Other concerns desiring to purchase flat glass, even in carload lots, must order their glass, at correspondingly higher prices, from distributors who are recognized factory buyers. PPG Industries, Inc., besides selling to recognized factory buyers, distributes a substantial part of the flat glass it produces through its own merchandising outlets. The outlets constitute an integrated system of distribution centers (warehouses) and service branches, located throughout the United States. The outlets serve buyers at all distribution levels, and thus are in direct competition with the entire independent distribution system. The centers also service the factory sales accounts of the direct factory buyers.

Most of the importers of flat and tempered glass are distributors, jobbers, manufacturers, fabricators, and contractors--predominantly firms that are also recognized factory buyers of domestic glass. The importers place their orders for foreign glass with U.S. sales agents of the foreign glass manufacturers, who in turn forward the orders to

the foreign manufacturers; some sales agents also import glass for their own account for resale, thereby acting as distributors. Distributors who import flat and tempered glass resell it through customary distribution channels, i.e., to jobbers, manufacturers, fabricators, contractors, and retailers. Manufacturers, fabricators, and contractors who import glass use it themselves in glazing or manufacturing.

Under the existing distribution system, various domestic users of flat and tempered glass may have access to supplies of domestic glass only at different levels of distribution. One user may qualify as a direct factory buyer, while another may not. The former thus can purchase glass at factory prices, while the latter will have to purchase at the next level at higher prices, i.e., from an independent glass distributor or PPG distribution center. Nonfactory buyers who are competing in end markets with factory buyers, and also with the flat-glass manufacturers themselves, are under competitive pressure to find sources of lower priced glass; some have done so by importing flat and tempered glass. Nevertheless, as noted above, most concerns importing flat and tempered glass also are recognized factory buyers who can purchase directly from U.S. producers of such glass. Firms which cannot purchase directly from domestic factories are believed to account for only a small share of the flat and tempered glass imported into the United States.

Depending on circumstances, the distribution chain in the United States for flat and tempered glass may have as few as two links, or it may have five links or more. Window glass, for example, may be

distributed from producer to door manufacturer; it might also be distributed from producer to independent glass distributor, to jobber, to retailer, and finally to home owner. Tempered replacement automotive glass might be distributed from motor vehicle manufacturer (who produced the glass) to new-car dealer (who installed it); it might be marketed from producer to independent glass distributor, to auto-glass jobber, and then to auto repair shop (which installs it).

U.S. Consumption 1/

Annual consumption of flat glass increased from 3.7 billion pounds in 1967 to 4.5 billion pounds in 1968 then eased to 4.4 billion in 1969 and to 4.3 billion in 1970. It rose sharply in 1971. Consumption during the first 6 months of 1971 (2.5 billion pounds) was a fourth larger than in the corresponding period of 1970 (2.0 billion pounds) (table 3).

The consumption of flat glass depends largely on the level of building construction and motor-vehicle shipments. The relationship is evident in the 1967-70 data, as shown below:

Indexes of flat-glass consumption, value of total nonfarm buildings put in place (in constant 1957-59 dollars), and shipments of motor vehicles, 1967-70

(1967=100)

Year	Flat-glass consumption	Value of nonfarm buildings	Shipments of motor vehicles
1967	100	100	100
1968	121	106	119
1969	120	108	113
1970	115	99	92

1/ Consumption is equal to shipments plus imports minus exports

The consumption of flat glass increased more in 1967-68 and was reduced less in 1969-70 than either building construction or automobile shipments, as growing use was made of glass in place of other materials in nearly all ends for which it served.

Consumption of most types of flat glass was larger in 1970 than in 1967; the 28 percent increase in the use of plate and float glass accounted for the major share of the total. Consumption of sheet glass increased 2 percent, and rolled glass 5 percent. That of polished wire glass declined 4 percent (table 4).

Consumption of tempered glass jumped from 774 million pounds in 1967 to over 1 billion pounds in 1968, then declined to 915 million pounds in 1970. The downward trend, however, was apparently reversed in 1971; consumption during January-June 1971 was 629 million pounds, about 30 percent greater than in the corresponding period in 1970.

Producers' Shipments 1/

U.S. producers' shipments of flat glass increased from 3,157 million pounds in 1967 to 3,806 million pounds in 1969, then declined slightly to 3,788 million pounds in 1970. Shipments during the first 6 months of 1971 were 28 percent larger than during the corresponding period in 1970, indicating that total shipments for 1971 should exceed 4 billion pounds. 2/

1/ U.S. producers' shipments include intracompany transfers, factory shipments to customers, shipments to producers' own company outlets for sale, and exports.

2/ Because of the objection by one producer that the publication might, by subtraction, reveal his operations, industry totals on sheet glass as reported to the Commission are treated as confidential. Data on sheet glass and other flat glass as reported to the Bureau of the Census are given in appendix B.

Producers' shipments of sheet glass, rolled glass and float glass increased between 1967 and 1970. The increase ranged from 6 percent for sheet glass to 175 percent for float glass. Shipments of polished wire glass on the other hand declined by 15 percent from 26 million pounds in 1967 to 22 million pounds in 1970 and those of plate glass declined 52 percent from 481 million pounds in 1967 to 229 million in 1970.

Shipments of tempered glass increased substantially (27 percent) from 766 million pounds in 1967 to 974 million pounds in 1968, but they declined to 895 million pounds in 1970. The downward trend, however, probably was reversed in 1971. Shipments during January-June 1971 amounted to 617 million pounds, 31 percent larger than in the same period in 1970.

U.S. Imports

U.S. imports of flat glass increased from 671 million pounds in 1967, when they were equal to 18 percent of U.S. consumption of flat glass, to 878 million pounds, equivalent to 20 percent of consumption, in 1968 (table 3). Imports declined in 1969 and again in 1970; and they amounted to 585 million pounds (14 percent of consumption) in 1970. The downward trend continued into the first half of 1971, when imports were 267 million pounds, an amount about 6 percent smaller than in the corresponding period of 1970. Imports in the first half of 1971 were equal to 11 percent of consumption.

Imports of each type of flat glass, except polished wire glass, declined between 1967 and 1970, both absolutely and as a share of the

U.S. market (table 4). Imports of sheet glass declined by 10 percent, from 461 million pounds in 1967 to 415 million pounds in 1970, they supplied 24 percent of the U.S. market in 1970 compared with 27 percent in 1967. Plate and float glass imports declined by 15 percent, from 148 to 126 million pounds, and their share of the market declined from 8 to 6 percent. Imports of rolled glass declined from 54 to 33 million pounds, or 39 percent, and their market share dropped from 29 to 17 percent. Imports of polished wire glass, on the other hand, increased by nearly 38 percent (from 8 million pounds in 1967 to 11 million pounds in 1970); their share of the domestic market increased from one-fourth to one-third.

Imports of tempered glass increased by over 140 percent from 26 million pounds in 1967 to 63 million pounds in 1969; imports in 1970 were 62 million pounds. The share of the domestic market supplied by imports doubled, from 3.4 percent in 1967 to 6.8 percent in 1970. Imports that were entered duty free under the provisions of the Automotive Products Trade Act of 1965 increased from 14 million pounds in 1967 to 32 million pounds in 1969 and 1970. Imports of 26 million pounds in the first 6 months of 1971 were 18 percent larger than in the corresponding period in 1970. Imports of dutiable tempered glass, principally non-automotive glass, increased from 12 million pounds in 1967 to 31 million pounds in 1969, but declined slightly in 1970 to 30 million pounds. The overall upward trend probably continued throughout 1971, as imports during January-June 1971 were 23 million pounds, or 15 percent larger than in the corresponding period in 1970.

Employment

The number of production and related workers employed on flat glass and tempered glass increased from about 19,000 in 1967 to 20,000 in 1968, but declined slightly in 1969 and declined 11 percent to 17,000 in 1970. The number on plate glass and float glass showed the most change; that on plate glass declined during the period by almost half while that on float more than doubled. From 1967 to 1970, combined employment on plate and float glass declined 10 percent while that on all flat glass and tempered glass together declined 8 percent. The details are shown in the table below.

Employment of production and related workers on flat glass and tempered glass in the United States, 1967-70

(Average number of workers)

Item	1967	1968	1969	1970
Sheet glass	6,207	6,092	6,014	5,096
Plate glass	5,561	5,153	4,779	3,267
Float glass	1,522	1,786	2,361	3,102
Rolled glass	730	744	624	611
Polished wire glass	191	208	163	154
Tempered glass	4,531	5,733	5,315	4,930
Total	18,742	19,716	19,256	17,160

Source: Derived from man-hours worked, shown in appendix A.

The following sections of this report discuss each type of flat glass and tempered glass individually. Each section is preceded by a colored page to assist the reader in locating the section. The color code is as follows:

Green	-	Sheet glass
Salmon	-	Plate and float glass
Beige	-	Rolled glass
Yellow	-	Polished wire glass
Pink	-	Tempered glass
Brown	-	Statistical appendix

SHEET GLASS

U.S. Consumption

Sheet glass

Consumption of all sheet glass (including window glass) is influenced by the level of building construction, particularly residential construction; by production of home furnishings, lighting fixtures, and appliances; and by the replacement demand. 1/ It is nearly independent of fluctuations in automobile production as float glass had, by mid-1971, largely displaced heavy sheet glass in automotive use.

During the period 1964-67, U.S. consumption of sheet glass averaged 1,873 million pounds annually (table 5). It amounted to 1,975 million pounds in 1968, when residential construction was significantly above the average for the preceding 4 years. Consumption continued at almost the same level in 1969, but declined 11 percent to * * * pounds in 1970, when there was a general shortage in mortgage money and a drop in residential construction.

During the first half of 1971, consumption of sheet glass was about 10 percent higher than it was in the corresponding period of 1970

* * * This increase largely reflected an improvement in housing starts.

Window glass

Since 1968, window glass has accounted for nearly two-thirds of total sheet-glass consumption. During the period 1964-67, consumption

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1/ The replacement demand tends to act as a stabilizing influence as it is based partially on the total number of dwellings in place rather than on the increment supplied by each year's new construction. Furthermore, additions and alterations to existing structures, and the resultant use of sheet glass tend to increase with the decline in new residential construction.

of window glass averaged 1,124 million pounds annually. It increased, by 13 percent, * * * in 1968, and amounted to * * * * * * pounds in 1969. It declined to * * * pounds in 1970 but it was 21 percent higher during the first 6 months of 1971 than in the corresponding period of 1970 (table 6). The increase reflected the generally buoyant state of housing construction during 1971.

Housing starts are expected to total 2,040 thousand in 1971, an increase of 600 thousand or nearly 40 percent over the number in 1970. Housing starts in 1972 are expected to amount to 2,150 thousand units. Over the longer term, factors influencing residential construction are favorable. The emergency Home Finance Act of 1970, allows the Federal Home Loan Mortgage Corporation (a part of the Federal Home Loan Bank System) and the Federal National Mortgage Association to buy mortgages from financial institutions thereby increasing the availability of mortgage money. In addition, much of the increase in the U.S. population during the 1970's will occur in the age groups favorable to family formation and the establishment of new households.

Heavy sheet glass

The consumption of heavy sheet glass increased from * * * pounds in 1967 to * * * in 1969, but declined to * * * in 1970 and was at an annual rate of only * * * pounds in the first 6 months of 1971 (table 7).

Most heavy sheet glass is now used for tempering. The quantity tempered, principally by producers of the raw glass, increased from * * * * * * pounds in 1967 to the level of 250 to 300 million pounds a year from 1968 through the first 6 months of 1971. The quantity used without tempering, after increasing in 1967-69 declined in the next 18 months until it became 40 percent less than in 1967.

The recent decline in the use of heavy sheet glass reflects its replacement by float glass, made by two of the same producers and even sold at the same price as heavy sheet. Float glass now accounts for the bulk of the glass used, whether for tempering or not, in the weight category (over 28 ounces per square foot) of heavy sheet. The quantity of heavy sheet glass used for tempering as well as for all purposes may have been reduced in the full year 1971, when the largest independent temperer built a float-glass plant, and so reduced if not eliminated its requirements for sheet glass.

Thin sheet glass

The consumption of thin sheet glass is small and has declined (table 8). It amounted to * * * (2.3 percent of the total) in 1967, and was at an annual rate of * * * pounds (1.7 percent of the total) in the first 6 months of 1971. Most of the reduction took place in that not over 12 ounces per square foot, which is used for microscope slides and limited other purposes.

U.S. Production, Shipments, Inventories, and Sales to Customers

Production of all sheet glass increased from 1,278 million pounds in 1967 to * * * pounds in 1969. It declined to * * * in 1970, but became 10 percent larger in the first 6 months of 1971 than in the same period in 1970 (table 9).

PPG Industries accounted for about * * * of the production in 1967-70 and for * * * of that in January-June 1971. The increase by PPG occurred at the expense of Libbey-Owens-Ford and Fourco which (notwithstanding an increase in the total for all companies) produced * * * * less sheet glass in January-June 1971 than in the corresponding period of 1970.

Shipments and intraplant transfers have generally corresponded closely with domestic production (table 10). They increased from 1,248 million pounds in 1967 to * * * pounds in 1969. They declined to * * * pounds in 1970 but were 15 percent larger during the first half of 1971 than in the corresponding period of 1970.

Year-end inventories increased from 128 million pounds in 1967, when they amounted to 10 percent of shipments, to 171 million pounds in 1969, when they amounted to 12 percent. They were reduced in 1970 although they remained in the same ratio to shipments as in the year before. They were presumably reduced somewhat in the first 6 months of 1971 as shipments and intracompany transfers exceeded production. A shortage of sheet glass was experienced later in the year, when a strong recovery of demand took place in the presence of exceptional

obstacles to imports from overseas. Schedules for the delivery of sheet glass by domestic producers lengthened from 4 weeks as at first to 12 to 15 weeks by November when, in view of the extreme situation, PPG imported some glass from its plants in Canada.

Kind

As shown for producers' shipments and intraplant transfers (table 11) sheet glass over 16 ounces and not over 28 ounces per square foot (window glass) is by far the principal kind, accounting for two-thirds to three-fourths of the total. Heavy sheet glass (over 28 ounces) accounts for nearly all the rest. The proportion of thin sheet glass (not over 16 ounces) is less than 2 percent.

Window glass is the only kind of sheet glass of which shipments and intraplant transfers have increased since 1969, as those of both heavy sheet and thin sheet have declined. Most of the increase, moreover, has taken place in the single-strength (19-ounce) window glass, as shipments and intraplant transfers of double strength (26-ounce) and "Other" (22-ounce) glass, for laminating, have been little more than maintained (table 12).

Sales to customers

The sales to customers increased from * * * pounds in 1968 to * * * pounds in 1969. They declined to * * * in 1970, then returned in the first 6 months of 1971 to about the same

average monthly rate as in 1969 (table 13). As has been noted for shipments and intraplant transfers, an increase in window glass was accompanied by a decline in thin sheet, heavy sheet, and (here shown separately) colored sheet glass.

The sales increased in value from * * * in 1968 to * * * * * * in 1969, declined to in 1970, and proceeded at the rate of * * * a year in the first 6 months of 1971 (table 13). The average unit value of the thin sheet glass increased, that of the heavy sheet declined, and that of the window glass fluctuated without definite trend over the 3-1/2-year period.

PPG Industries and Libbey-Owens-Ford account for about * * * of the sales of window glass to customers (table 14) and for * * * * * of those of heavy sheet glass (table 15). The average unit value of sales to customers by PPG Industries and Libbey-Owens-Ford is appreciably above that by the two smaller firms, whether for window glass or heavy sheet.

Marketing channels

The * * * pounds sold to customers in 1970 accounted for 87 percent of the supply of sheet glass by the producers. The remaining * * * pounds (13 percent) consisted of intracompany transfers for processing (table 16).

Sash-and-door manufacturers are the principal users of sheet glass, taking * * * pounds (41 percent) of the supply in 1970. Jobbers, wholesalers (including company-owned outlets), and contractors took

* * * pounds (33 percent). Mirror manufacturers took * * * (7 percent) and temperers, * * * (5 percent). A variety of other customers, for fabricating, insulating, laminating and miscellaneous uses, accounted for most of the remainder. The quantity going to automobile manufacturers was * * * pounds (2 percent).

The average unit value of the glass supplied, reflecting differences in composition as well as price, ranged from 9.8 cents a pound for sash-and-door manufacturers to 11.6 or 11.7 cents for distributors (including company outlets).

U.S. Imports

Sheet glass

Imports of sheet glass amounted to 461 million pounds in 1967. They increased to 629 million in 1968 when they accounted for 32 percent of U.S. consumption--the largest proportion in the two decades since 1950. Imports declined to 523 million pounds in 1969, and to 415 million pounds in 1970, when they supplied 24 percent of consumption, about the same proportion as in years when the full increased rates of duty were in effect. Imports in the first half of 1971 were hardly as large as in the corresponding months of the previous years, notwithstanding an increase in consumption. Liability to antidumping duty was incurred on most sheet glass from Japan and Taiwan after the beginning of 1971 and on much of that (heavy sheet) from West Germany and France and nearly all of that from Italy after the first quarter of the year. A 3-1/2-month dock strike on the West Coast, beginning

in July, the abandonment of official support for the dollar and the imposition of a surcharge on imports in August, and a 2-month dock strike on the Atlantic and Gulf Coasts beginning in October all provided an additional impediment to imports later in the year.

Imports of sheet glass enter from Belgium, West Germany, Japan, Italy, the Republic of China (Taiwan), the United Kingdom, and some 25 other countries (table 17). About 10 percent enter from Communist dominated countries and are subject to the full statutory rate of duty.

Window glass

Imports of window glass increased from 269 million pounds in 1967 to 389 million in 1968 (table 18), when they accounted for 31 percent of consumption. They declined to 233 million pounds in 1970, when they accounted for 20 percent, and they continued in the first 6 months of 1971 at about the same rate as in the corresponding period of 1970.

About 85 percent of imported window glass consists of single-strength glass, and the remainder, of double-strength. Most of the imported glass of both kinds is slightly thinner than the domestic. The bulk of the single strength is 18-ounce rather than 19-ounce glass, and the bulk of the double strength is 24-ounce rather than 26-ounce.

Imports are derived from Italy, Japan, West Germany, Belgium, Taiwan, and a number of lesser sources (table 18). Those from Communist countries, dutiable at the statutory rate, account for 17 percent of the total.

Heavy sheet glass

Imports of heavy sheet glass increased from 172 million pounds in 1967 to 221 million pounds in 1968, but declined to 165 million in 1970 and were 20 percent less in the first 6 months of 1971 than in the corresponding period of the previous year (table 7). The ratio of imports to consumption increased from 31 percent in 1967 to 33 percent in 1968, then declined irregularly to 26 percent in the first 6 months of 1971.

Thin sheet glass

Imports of thin sheet declined from 20 million pounds in 1967 to a level of about 17 million pounds a year in 1969 and 1970 and were 53 percent less in the first 6 months of 1971 than in the corresponding months of the previous year (table 8). As a share of consumption the imports declined irregularly from 51 percent in 1967 to 42 percent in the first 6 months of 1971.

Employment

Employment in plants manufacturing sheet glass declined gradually from 9,783 persons in 1967 to 9,288 in 1969, then dropped 31 percent to 6,418 in 1970 (tables 19 and 20). Most of the drop in 1970 resulted from the termination of production of sheet glass by Ford Motor Co. at its Nashville plant. This plant was already predominantly engaged in the manufacture of float glass, and in 1970 it became wholly so and hence was not counted among the producers of sheet glass. At the other plants, the reduction in the average number of employees

from 1969 to 1970 (table 20) was 9 percent, and the reduction over the period from 1968 to 1970 was 10 percent.

Output of sheet glass per man-hour, with the growing use of labor-saving equipment, has increased materially in recent years. It was 103 pounds in 1967, 112 pounds in 1968, 122 pounds in 1969, and 132 pounds in 1970. An increase in output per man-hour since 1967 has occurred by all 4 producers. The most pronounced increase, however, has occurred in that by Libbey-Owens-Ford and PPG Industries which is now * * * larger than by either of the other producers (table 21).

A total of 1,480 workers in sheet glass plants have been certified for adjustment assistance by the Secretary of Labor under the Trade Expansion Act of 1962. The date of the earliest certification was May 1970 and that of the most recent October 1971. The date of unemployment for the workers benefited extends as far back as November 1967, as shown in the following table.

Sheet glass: Estimated number of workers laid off and certified for adjustment assistance under the Trade Expansion Act of 1962, February 1970-December 1971

Firm and plant	Number of workers	Date of unemployment	Date of certification
ASG Industries:			
Arnold, Pa	350	2-1-68	5-25-70
		1/ 11-9-67	1/ 1-8-71
Jeannette, Pa	200	4-9-69 to 1-1-70	7-16-70
PPG Industries, Inc:			
Henryetta, Okla	300	11-15-69	10-1-70
Clarksburg, W.Va	220	12-25-69	8-6-71
		1/ 5-11-70	1/ 10-14-71
Libbey-Owens-Ford Co:			
Shreveport, La	410	4-22-71 to 9-27-71	10-15-71

1/ Revised.

Source: U.S. Department of Labor.

Prices

U.S. producers' prices

U.S. producers publish prices for window glass in terms of common specifications long used in the industry. The prices vary with the thickness, size, quality, and packaging of the sheets. The pricelists specify as many as 5 quality grades, 9 bracket sizes (united inch categories), and 6 kinds of packaging. If a price were quoted for every combination of quality, size bracket, and packing method, single strength sheet glass alone would be available at 270 different prices. Actually all combinations are not available; nevertheless, LOF, for example, lists 145 basic prices for single strength window glass. Because of the variety of combinations, the price for any particular combination covers only a small percent of the sheet glass sold.

List prices by the three leading producers are the same, and a change in list price by one of them, which happens once or twice a year, is adopted by the other two within a few days. List prices by the fourth producer are maintained at a level slightly below those by the other three.

The list price is quoted freight prepaid to customers' warehouse at any destination in the United States except Alaska and Hawaii. The freight absorbed ranges from less than 1 percent to about 14 percent of the selling price, and averages 7 or 8 percent. The producer grants an allowance or rebate on freight at the commercial rate to a buyer who elects to pick up the shipment at the factory, and this is done on an estimated 50 to 60 percent of the shipments.

To obtain the actual price at which the glass is sold, the Commission asked for a random sample, by plant, in each calendar quarter beginning in 1969, of 5 shipments, freight prepaid, in the following specifications:

1. Clear sheet glass, 19 ounce, "B", 50 to 60 united inches, shipped in heavy pallets of 3,000 square feet, and

2. Clear sheet glass, 3/16 inch, 10 to 25 square feet, shipped in standard pallets of 1,000 square feet.

Based on the reported shipments, a margin of delivered price below list is common. It results from the interval between order and delivery as well as from other causes. The data are shown by company in tables 22 and 23. The list price and the average delivered price for all companies combined are shown in the following table.

Window glass and heavy sheet glass: U.S. producers' published list prices and average delivered prices on shipments, by quarters, January 1969-September 1971

(In cents per square foot)

Period	Window glass (19-ounce)		Heavy sheet glass (3/16 inch)	
	List price	Average price	List price	Average price
1969:				
First quarter	11.1	10.8	30.5	29.9
Second quarter	11.7	10.8	32.0	29.9
Third quarter	11.7	10.9	32.0	31.1
Fourth quarter	11.7	10.8	32.0	30.6
1970:				
First quarter	11.7	10.8	32.0	28.9
Second quarter	11.2	9.9	32.0	29.1
Third quarter	10.9	10.3	30.6	29.8
Fourth quarter	10.9	10.5	30.6	29.0
1971:				
First quarter	10.9	10.3	30.6	29.2
Second quarter	11.8	10.7	33.1	30.8
Third quarter	11.8	11.2	33.1	30.9

Source: Derived from data furnished to the U.S. Tariff Commission by the producers.

As indicated above, the list price has changed repeatedly since 1969, and the changes have been accompanied by more or less equivalent changes in the average price. In general the average price has lagged behind the list price on the increase and has preceded it on the decline, resulting in a difference between them of 2-1/2 to 11-1/2 percent. Both measures of the price for window glass as well as heavy sheet, increased in 1969 and, after declining in 1970, increased in 1971 to the highest level of the period.

The producers have submitted data on their annual sales below list price since 1967. Those data, as summarized in the table below, show that the proportion of sales below list price as well as the average discount allowed on those sales increased steadily from 1967 through 1970, but declined in January-June 1971.

Share of U.S. producers' sheet-glass sales made at less than published prices and average discounts from published prices, 1967-70 and January-June 1971

(Percent)

Item	1967 1/	1968 1/	1969	1970	January-June 1971
Share of total sheet-glass sales made at less than published prices	3.7	11.2	18.3	27.2	22.9
Average discount from published prices	3.9	6.4	10.3	12.7	11.2

1/ The figures shown in this table differ somewhat from the corresponding figures published in December 1969 (TC Publication 310), which were based on earlier reports to the Tariff Commission.

Source: Computed by the U.S. Tariff Commission from data supplied by the domestic producers.

Importers' prices

Importers are generally at a disadvantage with domestic producers in promptness and certainty of delivery, terms of payment, recognized and consistent quality, technical assistance to buyers, and market research and development. On the whole, it is acknowledged in the trade that imported glass requires a price advantage of about 5 percent to be competitive with glass produced in the United States.

During 1968-69, as the prices reported by buyers for both domestic and West European window glass (table 24) tended upward, the spread between domestic and West European glass generally diminished. When domestic prices were reduced in 1970, the price of West European glass sometimes became higher than that of the domestic glass. The prices reported by buyers of heavy sheet glass (table 25) unlike those just discussed have moved irregularly. Like the prices just discussed, however, they show a reduction or reversal in 1970-71 of the difference formerly existing in the United States between the price of imported and domestic glass.

Profit-and-Loss Experience of U.S. Producers of Sheet Glass

The data reported in this section represent the financial experience of U.S. producers on sales accounting for more than 90 percent of the domestic shipments of sheet glass in each of the years shown and virtually all of the domestic shipments of window glass. The data shown for the years 1966-70 aggregate the profit-and-loss data of four firms. 1/

The aggregate value of net sales (including intracompany transfers) 2/ of sheet glass by the firms reporting data to the Commission increased erratically from 1966 to 1969, but then decreased in 1970. Aggregate sales rose from $131.6 million in 1966 to * * * in 1969, and then declined to * * * in 1970 (table 26). The changes in aggregate net operating profits and in the ratios of profits to net sales for the companies concerned also moved in an erratic fashion. Net operating profits declined from $6.8 million in 1966 to * * * in 1967, increased to * * * in 1968, declined slightly to * * * in 1969, then declined sharply to * * * in

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1/ The only firm producing significant quantities of sheet glass for which profit-and-loss data were not available was the Ford Motor Co. Ford's production of sheet glass, which is predominantly captive, amounted to less than * * * (based on weight) of the domestic industry's aggregate output in 1968. The Fourco Glass Co. operated 2 separate sheet glass companies, Harding Glass Co. and Rolland Glass Co., during 1966-69. In 1970 Harding and Rolland were merged into Fourco. The profit-and-loss data provided by Fourco covers its combined sheet glass operations for 1966-70.

2/ In 1970 intracompany transfers of sheet glass accounted for about 13 percent of aggregate net sales. For PPG Industries, Inc., intracompany transfers accounted for about * * * of its aggregate net sales; for Libbey-Owens-Ford Co. such transfers accounted for about * * * * of its sales; and for each of the other 2 companies intracompany transfers accounted for * * * or less of their sales in 1970.

1970. Net operating profits were equivalent to 5.1 percent of net sales in 1966; the ratio of net operating profits to net sales declined to * * * in 1967, rose to * * * in 1968, declined to * * * * * * in 1969, then dropped to less than * * * in 1970.

One firm * * * * * reported net operating profits in each of the years under review,

* * * * * * * *

Those for all companies combined are summarized in the following table.

Sheet glass: U.S. producers average selling price, cost of sales, administrative and selling expense, and net operating profit, 1966-70

(In cents per pound)

Unit	1966	1967	1968	1969	1970
Net sales	10.4	10.6	10.5	10.2	9.6
Cost of goods sold	8.8	9.1	8.7	8.5	8.6
Administrative and selling expense	1.1	1.2	1.2	1.1	1.0
Net operating profit before taxes	.5	.3	.6	.6	1/

1/ Less than 0.05 cent per pound.

Source: Computed from information submitted to the U.S. Tariff Commission by the U.S. producers.

U.S. Consumption

Apparent consumption of plate and float glass in the United States increased from 748 million square feet in 1967 to 947 million in 1968. It declined to 911 million in 1970, but in the first 6 months of 1971 it rose to an annual rate of 1,119 million square feet a year and was 26 percent larger than in the corresponding period of 1970 (table 29).

A large part of the supply is laminated or tempered by the producers and sold for automotive use, and most of the rest is used in building construction. A strong upward trend in the consumption of plate and float glass has prevailed over a considerable period because of the growing replacement of heavy sheet glass by float glass. The reduction in the consumption of plate and float glass in 1970 reflected the general recession as well as a 67-day strike, beginning September 14, against General Motors, which is the largest single customer.

U.S. Producers' Shipments, Production, and Inventories

Float glass is a relative newcomer into the flat-glass field; the first production in the United States began in 1964. In that year, plate glass probably accounted for 95 percent of the aggregate U.S. production of plate and float. It rapidly replaced plate glass; by 1970, float accounted for about 75 percent, and, in January-June 1971, for about 90 percent of plate-float production in the United States (tables 29a and 29b). As a result of the emergence of float, production

of plate and heavy sheet glass is being phased out. Float is a direct substitute for plate and has been priced the same as equivalent thicknesses of plate, but is much more economical to produce.

In 1967, 56 percent of total plate-float production consisted of clear glass. The percentage declined in each of the following years and in 1970 production was about equal, 456.3 thousand square feet of clear and 453.6 thousand square feet of colored (including tinted). In 1969 and 1970, more colored glass than clear glass was manufactured by the float process.

Shipments and intracompany transfers of plate and float glass by U.S. producers rose sharply in 1968, being 26 percent higher in that year (725 million square feet) than in 1967 (898 million square feet) (table 29). Shipments were stable in 1969 and 1970, but they increased sharply again in 1971, being up during January-June, 1971, 27 percent over the corresponding period in 1970 (441 to 560 million square feet).

In recent years about two-thirds of the shipments of plate and float glass by U.S. producers have consisted of intracompany transfers, over 90 percent of which was for automotive uses (table 30). Factory shipments to customers in 1969 and 1970 were widely distributed by end use, as shown in the following table.

Plate and float glass: Percentage distribution of intracompany transfers and factory shipments to customers by U.S. producers, 1969-70

Classification	Percent of shipments	
	1969	1970
Intracompany transfers	67.9	65.2
Automotive uses	93.7	92.7
Factory shipments to customers	32.1	34.8
Automotive uses	20.3	22.0
Distributors and contractors	31.2	30.8
Mirror manufacturers	12.8	13.7
Exports	10.7	12.7
Company-owned outlets	6.9	5.7
Others 1/	18.1	15.1
Total	100.0	100.0

1/ Includes sash and door manufacturers, laminators and temperers (nonautomotive), and miscellaneous special fabricators.

Factory shipments to customers, as a percentage of total plate-float shipments in 1970, increased over 1969 reflecting the drop in automobile production, 1970 vs. 1969. Automotive uses accounted for about 70 percent of total U.S. shipments of plate and float glass in these two years (table 31).

For the years 1967-70, the amount of year end inventories of plate and float glass (in thousands of square feet) and the ratio of inventories to shipments are shown below.

Plate and float glass: Yearend inventories and ratios of such inventories to annual shipments, 1967-70

Year	Yearend inventories	Ratio of inventories to annual shipments
	1,000 sq. ft.	Percent
1967	63,114	8.7
1968	53,889	6.0
1969	70,403	7.8
1970	89,864	10.0

U.S. Imports

U.S. imports of plate and float glass, for the period 1967-70, reached a high in 1968 (74.2 million square feet) and then declined to a low in 1970 (52.6 million square feet)(table 33). The ratio of imports to consumption for the period ranged from 8.2 percent in 1968 to 5.8 percent in 1970. In January-June, 1971, the ratio further dropped to 4.1 percent.

Virtually all imports of plate and float glass enter the United States at MFN rates of duty. These duties, reflecting Kennedy Round concessions under the GATT, have been reduced in each year since 1967. The rates effective January 1, 1972, are about 50 percent below January 1, 1967, rates. Despite an annual decrease in rates of duty during the period covered, imports since 1968 have shown a steady decline.

Japan and Belgium have been the leading suppliers of this type of glass; France, Italy, West Germany, Canada, and the United Kingdom have been important secondary suppliers.

U.S. Exports

During the period 1967-70, annual U.S. exports of plate and float glass ranged from 26 million square feet (35 percent of imports) in 1968 to 40 million square feet (75 percent of imports) in 1970 (table 29). In the first half of 1971, the United States enjoyed a slight export surplus in its foreign trade in these products. Exports ranged from 3 to 5 percent of domestic shipments during the period. Canada was the only important market.

Employment in U.S. Establishments Producing Plate and Float Glass

The average number of employees in the plate-and-float glass industry in the years 1967-70 ranged from 14.3 thousand in 1970 to 16.4 thousand in 1968 (table 34). The number of production and related workers ranged from 11.9 thousand in 1970 to 13.7 thousand in 1968. With the wide substitution of float for plate glass during these years, the annual man-hours worked on plate glass fell by almost half while that for float glass doubled.

Plate glass

The number of hours worked on plate glass declined from 11.1 million in 1967 to 6.5 million in 1970. The decline was most pronounced in the companies that now produce float glass.

U.S. production of plate glass, the number of man-hours worked in its manufacture, and the average output per man-hour in 1967-70 are shown below.

U.S. production of plate glass, man-hours worked by production and related workers, and production per man-hour, 1967-70

Year	Production	Man-hours worked	Production per man-hour
	Million sq. ft.	Millions	Sq. ft.
1967	504.0	11.1	45.3
1968	479.5	10.3	46.5
1969	365.1	9.6	38.2
1970	216.0	6.5	33.1

The production of plate glass per man-hour varied among the different producing companies, ranging from a low of 29.0 square feet to a high of 40.7 square feet.

Float glass

The output of float glass increased markedly during the 4-year period 1967-70. The number of man-hours necessary to effect this increase more than doubled. At the same time, output per man-hour increased considerably, though irregularly, as new plants coming on stream adversely affected the overall efficiency of the industry.

U.S. production of float glass, the number of man-hours worked in the manufacture of such glass, and the average output per man-hour for the years 1967 through 1970 are shown below.

U.S. production of float glass, man-hours worked by production and related workers, and production per man-hour, 1967-70

Year	Production	Man-hours worked	Production per man-hour
	Million sq. ft.	Millions	Sq. ft.
1967	264.6	3.0	87.0
1968	411.4	3.6	115.2
1969	560.0	4.7	118.6
1970	693.8	6.2	111.8

As with plate glass, the average output per man-hour on float glass varied considerably from one producer to another, ranging from a low of 75.5 square feet to a high of 166.9 square feet.

Prices

Published prices of plate and float glass

Terms of sale.--The U.S. producers generally publish list prices for plate and float glass, from which they offer trade and payment (cash) discounts; changes in published prices are effected by changing the discounts offered, while the list price remains unchanged. The price of plate and float glass of comparable specifications by different producers is identical. The net price per square foot varies directly with the thickness of the glass and size of the light; cut sizes are higher in price per square foot than standard sizes and stock sheets. Published prices of clear plate and float glass are generally uniform throughout the United States; a price differential which had resulted in higher prices west of Denver was terminated early in 1967. An east-west differential in the published prices of tinted plate and float, ranging from 4 percent to 10 percent depending on the product, is still in effect. The U.S. producers absorb all freight on shipments of plate glass of 2,000 pounds and more (virtually all shipments) to destinations in continental United States. Extra charges are added on shipments to Hawaii and Alaska.

The U.S. agents for foreign producers publish prices for plate and float glass generally based on the specifications that are used by domestic producers. For most imported, as for domestic plate and float glass, the price per square foot varies with the thickness and size of

the sheet. Prices for the imported, like the domestic, moreover, are generally quoted delivered to the customer's warehouse with a freight allowance (based on published tariffs) to the buyer if he picks up the glass with his own trucks.

Recent price history.--Since the mid-1960's, the prices of plate and float glass in the United States have been increased, on the average, by about a fifth by both U.S. producers and agents of foreign producers. Price changes have been effected chiefly by two means--(1) by changing published prices, pricing practices, and terms of sale and (2) by granting unpublished price concessions.

In mid-1970 the published prices of domestic plate and float glass were, on the average, about 17 percent higher than in mid-1967. The extent of the increase, however, varied widely among various types of such glass. A notable exception was mirror-quality plate and float glass (1/4-inch stock sheet, one size per case even inches, 15-25 square feet) which had a lower published price in 1971 than in 1967 (table 35). Changes in terms of sale and pricing practices were not extensive. Cash discounts were increased from 1 to 2 percent late in 1964.

Published prices for plate and float glass quoted by different U.S. producers customarily are identical, 1/ as are the published prices quoted by agents of the major foreign suppliers. In recent years the prices published by the U.S. agents of the major foreign suppliers have generally been slightly below those by the domestic producers. During

1/ Price changes announced by one manufacturer usually are followed shortly by the other producers. LOF is the price leader.

nearly all of the period 1966-70, the agents of most foreign producers offered 1/4-inch, clear, glazing-quality plate glass (and comparable float glass as it became available) at published prices about 3 percent below those by U.S. producers for comparable glass.

Unpublished price discounts

A comparison of the published prices by U.S. producers with those by agents of foreign producers presents only a partial picture of price relationships between the two. Some domestic and some imported plate and float glass is sold at prices below the published prices. According to the producers, when they receive adequate documentation of price offers by others below their published prices, they at times meet, or partially meet, those prices. The producers state that they have made such price concessions to meet the lower prices of imported plate and float glass. Such price reductions, however, are made on only a very small share of their shipments (including intracompany transfers). The breadth and depth of the price concessions reported by three domestic producers (ASG, PPG, and LOF) have been approximately as follows.

Shipments marketed below published prices 1/

(Percent)

Item	1967 2/	1968 2/	1969	1970	Jan.-June 1971 3/
Share of total plate and float shipments marketed below published prices	1.5	1.8	3.4	4.8	3.0
Average discount below published prices	9.1	6.9	13.7	15.6	6.5

1/ Computed by the Tariff Commission from data supplied by the domestic producers.
2/ Revised. 3/ PPG and LOF only.

Statistical data on the extent and character of price discounting by agents of foreign firms--i.e., the share of the U.S. imports of plate and float glass that is sold below published prices and the degree to which the published prices are discounted--are not available. The U.S. producers, however, have submitted documentation of such discounting by importers.

Profit-and-Loss Experience of Domestic Producers of Plate Glass

The data reported in this section represent the financial experience of three domestic producers of plate glass who account for virtually all of the plate glass shipped by domestic producers in 1970.

All products

The aggregate value of net sales (including intracompany transfers) of all products produced in the establishment(s) 1/ in which plate glass was produced declined from $285.2 million in 1966 to $268.2 million in 1967, increased to $330.6 million in 1969, and then declined to $294.5 million in 1970 (table 36). The changes in aggregate net operating profits and in the ratios of profits to net sales followed the same general pattern for the years 1966-70 but a somewhat different pattern for the years 1967-69. Aggregate net operating profits (before income taxes) increased from $43.4 million in 1966 to $58.6 million in 1968, and then declined to $36.3 million in 1970. As a percent of sales, the aggregate profits averaged 15.2 percent in 1966, 17.6 percent in 1967, 18.4 percent in 1968, 16.2 percent in 1969, and 12.3 percent in 1970.

1/ For ASG Industries, Inc., all operations include data on the establishment in which plate glass only is produced, for Libbey-Owens-Ford Co., all operations include data on the establishment(s) in which plate, float, rolled, and polished wire glass are produced, and for PPG Industries, Inc., data cover plate, float, and rolled glass only.

Plate glass

In 1966 net sales of plate glass accounted for about 63 percent of the total sales value of all products made in the establishments in which such glass is produced. In 1970 plate glass accounted for only about 33 percent of such sales. The aggregate net sales (including intracompany transfers) of plate glass for the three producers declined from $179.8 million in 1966 to $151.4 million in 1967, increased to $170.5 million in 1968, and then declined to $96.3 million in 1970 (table 36). The changes in aggregate net operating profits followed the same pattern. Aggregate net operating profits declined from $41.5 million in 1966 to $30.8 million in 1967, increased to $34.9 million in 1968, and then declined to $4.8 million in 1970. As a percent of sales, the aggregate profits averaged 23.1 percent in 1966, 20.3 percent in 1967, 20.5 percent in 1968, 15.1 percent in 1969, and 4.9 percent in 1970. One producer, * * * reported a net operating loss in 1967; another producer, * * * reported a net operating loss in 1970 (table 37).

For two producers, Libbey-Owens-Ford Co., and PPG Industries, Inc., intracompany transfers accounted for a substantial share of reported net sales value of plate glass in each of the years 1966-70. 1/ According to company officials, the intracompany transfers were valued at the

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1/ For Libbey-Owens-Ford Co., intracompany transfers accounted for * * * or more of the total reported net sales value for each of the years 1966-70. The percentage for PPG Industries, Inc., was * * * * * or more in each of the aforementioned years.

prevailing market value less adjustment for expenses (freight, selling expenses, etc.) not actually incurred by selling on the open market.

The unit value of producers' net sales and intracompany transfers increased gradually from 1967 to 1969 and increased sharply in 1970, in part, at least, because of the growing proportion of the total that consisted of heavy plate. The increase in unit value of sales, however, was not enough to cover the increase in costs, and producers' net operating profits on plate glass declined from 1967 through 1970. Data for the individual producers is shown in table 38 of the appendix. Those for combined producers is summarized in the following tabulation.

Plate glass: U.S. producers' net sales, cost of sales, administrative and selling expense, and net operating profit or (loss), 1967-70

(In cents per square foot)

Item	1967	1968	1969	1970
Net sales 1/	37.8	38.2	38.7	42.1
Cost of sales	26.8	27.4	29.6	36.1
Administrative and selling expense	3.3	3.0	3.3	3.9
Net operating profit or (loss) before income taxes	7.7	7.8	5.8	2.1

1/ Including intracompany transfers.

Source: Compiled from information submitted to the U.S. Tariff Commission by domestic producers.

Profit-and-Loss Experience of Domestic Producers of Float Glass

The data reported in this section represent the financial experience of two domestic producers of float glass who accounted for about of the total quantity of float glass shipped by domestic producers in 1970. 1/

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1/ Ford Motor Co., the only other significant producer of float glass, did not submit profit-and-loss data.

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The unit value of producers' sales and intracompany transfers has declined 20 percent since 1966, in part, at least, because of a growing proportion of thin (1/8-inch) and medium thick (3/16-inch) float glass. A more than proportionate decline has taken place in unit costs. Net operating profits per unit have accordingly increased and have become

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half again as large as those formerly realized on plate glass. Data for the individual producers are shown in table 41 of the appendix. Those for the combined producers are summarized in the following tabulation.

Float glass: U.S. producers' average selling price, cost of sales, administrative and selling expense, and net operating profit or (loss), 1966-70

(In cents per square foot)

Item	1966	1967	1968	1969	1970
Net sales 1/	41.0	32.9	32.6	33.3	31.7
Cost of sales	30.8	20.9	17.7	17.4	17.5
Administrative and selling expense	2.9	2.5	3.2	3.5	3.6
Net operating profit or (loss) before income taxes	7.3	9.5	11.7	12.4	10.6

1/ Including intracompany transfers.

Source: Compiled from information submitted to the U.S. Tariff Commission by the U.S. producers.

U.S. Consumption

U.S. consumption of rolled glass has declined since the mid-1960's. The decline is attributable to safety glazing legislation which has led to the substitution of acrylic plastics in specific applications, particularly in mobile homes, to a declining usage of jalousie louvres (which are often constructed of rolled glass), and to a depression in residential construction in 1969 and 1970.

Apparent U.S. consumption averaged 208 million pounds during 1964-66; it declined to 185 million pounds in 1967, then increased to 208 million pounds in 1968. It declined slightly in 1969, and further declined to 195 million pounds in 1970. In the first half of 1971 it was 3 percent less than in the corresponding period of 1970 (table 42).

U.S. Production, Shipments, and Inventories

U.S. production of rolled glass increased from 143 million pounds in 1967 to 167 million pounds in 1970 (table 43). During the first 6 months of 1971, however, it was approximately 15 percent less than in the first 6 months of the year before. The increase in 1967-70 occurred by * * * one of the two major U.S. producers, and Armstrong Glass Co. (acquired in 1971 by C-E Glass), a new producer, which accounted for an important share of U.S. production in 1968, 1969, and the first half of 1970. Production by the other major U.S. producer,

* * * , declined from 1967 to 1969,

* * *

U.S. shipments of rolled glass to customers increased from 122 million pounds in 1967 to 148 million pounds in 1969, or by 22 percent, but declined to 139 million pounds in 1970. In the first half of 1971, shipments were about 9 percent lower than in the corresponding period of the previous year (table 43). About 90 percent of shipments consist of ordinary or uncolored rolled glass; the balance is colored or special glass. Colored rolled glass, while representing a small share of either total domestic production or shipments, is the principal product of several small rolled glass producers.

The great bulk of rolled glass is sold directly to customers, of which distributors (including jobbers, wholesalers, and contractors) and sash and door manufacturers are the most important. Shipments to company owned outlets account for only about * percent of the total.

Intracompany transfers for processing more than doubled, increasing from 13 million pounds to 27 million pounds, between 1967 and 1970. The increase continued into the first half of 1971. Further processing in rolled glass establishments includes surface coating, cutting and beveling to jalousie sizes; fabricating into spandrels, insulating units, or light fixtures; and tempering. The latter, due to the increase in safety glazing legislation is thought to account for much of the increase.

Year-end inventories of rolled glass have declined since 1967, from 53 million pounds to 36 million pounds. In 1967, factory inventories amounted to more than 40 percent of factory shipments, but in 1970, the ratio was reduced to about 25 percent. The generally high

level of inventory, as compared to other flat glass products, results from the necessity of stocking a large number of patterns. A year's supply of a particular pattern, for instance, may be run in 3 or 4 days' operations on the production line.

U.S. Imports

U.S. imports of rolled glass averaged about 63 million pounds a year during the mid-1960's. Imports declined to 54 million pounds in 1967, rose to 61 million pounds in 1968, then declined to 45 million pounds in 1969, and 33 million in 1970. As shown in table 45, imports of rolled glass in 1970 were at the lowest level in recent years. Imports were slightly larger in the first 6 months of 1971 than in the comparable period of the previous year.

During the period 1967-70, the share of U.S. consumption of rolled glass supplied by imports decreased by almost one-half, from 30 percent in 1967-68 to 17 percent in 1970. The data in table 42 show a slight increase in the first half of 1971, above the share in the first half of 1970.

During the period 1967-70, Belgium, Japan, Poland, West Germany, and Taiwan accounted for nearly 90 percent of the imports. Imports (at the statutory rates of duty) from Communist dominated countries, once appreciable, have amounted to less than 1 percent of the total since 1967.

Nearly 85 percent of the quantity from all sources has consisted of ordinary (clear) rolled glass; the remainder has consisted of the colored or special.

A substantial part of the rolled glass imported from Japan consists of rough rolled wire blanks imported by U.S. producers. Unlike the domestic product which is not more than 60 inches wide, the imported blanks are up to 78 inches wide. The extra width permits the installation of rolled wire glass panels or (after grinding and polishing),polished wire glass panels in larger sizes with less cutting and handling, and with less loss of material. Nearly half of Japanese exports of rolled glass consisted of rolled wire blanks in 1970.

U.S. Exports

U.S. exports of rolled glass averaged 5.7 million pounds in 1967-70, and accounted for about 4 percent of total shipments. Exports at this level were considerably larger than in the 1964-66 period when they averaged 3.8 million pounds per year, and accounted for 2.6 percent of shipments. Year-to-year fluctuations of exports have been substantial. Canada, the Netherlands, and Australia have been the principal destinations.

Employment

Since 1965, the number of employees in establishments producing rolled glass as a principal product (i.e., all except those of LOF and PPG), has remained generally stable at about 1,100. The number in 1969

and 1970 was slightly lower than in the previous two years (table 46), but the variation between the high (in 1967) and the low (in 1969) was only 5 percent.

The number of man-hours worked by production and related workers in the establishments remained constant at 1.7 million a year in 1967-70, but the man-hours worked on rolled glass declined from 1.4 to 1.2 million. Other products produced in rolled glass establishments are polished wire glass, several types of coated rolled glass, spandrels, tempered glass, laminated glass, and various fabricated or semi-fabricated glass products.

The reduction in man-hours worked on rolled glass, particularly in 1969 and 1970, accompanied a substantial increase in the output per man-hour as shown below:

Output and output per man-hour (OPMH) for production and related workers producing rolled glass, 1/
1967-70

Year	Production	Man-hours	OPMH
	Million pounds	1,000 hours	Pounds
1967 2/	143	1,460	98
1968 2/	147	1,488	99
1969	155	1,248	124
1970	167	1,221	137

1/ Does not include employees making rough plate glass blanks.
2/ Revised.

As shown in table 47, wide variations occur in output per man-hour between establishments and, occasionally, between different years at the same establishment. Generally, the output per man-hour by the major rolled glass producers, which operate continuous production lines, is much larger than by the small specialty producers who use the intermittent process to produce a wide range of colors and patterns. While the large producers are essentially capital intensive, the small are essentially handcraft producers. The output per man-hour data for the Armstrong facility is probably overstated in view of the management difficulties known to have existed at that facility; nevertheless, that facility, which is newer than the rest, does contain some efficiency innovations not in use at other rolled glass establishments.

Wide annual fluctuations at a single establishment, notably in 1970 at C-E's Floreffe, Pa., plant, reflect a high level of production for inventory, prior to the shutdown of the facility as a rolled glass plant.

Output per man-hour by LOF and PPG is for rough plate glass blanks, and is not comparable with that by others for either ordinary rolled glass, or for special or colored rolled glass.

Prices and Terms of Sale

The two major producers of rolled glass now list prices for rolled glass on an f.o.b. factory basis, freight allowed to destination. Until late 1970, rolled glass was sold f.o.b. factory, freight equalized with competing factories. The current pricing system results

in quoting a delivered price to the customer's warehouse. Pricelists include a 2 percent cash discount. Customers who elect to pick up glass at the factory in their own trucks receive a freight allowance computed on the actual weight picked up, trailerload rate to destination.

ASG Industries maintains two pricelists--one applicable to destinations in the six far western States and Alaska, and the other applicable to the rest of the United States. Prices applicable to the far western States are about 10 percent higher to reflect the additional freight. C-E Glass, with factories on both sides of the Rockies, quotes the same price throughout the country.

Separate prices are usually quoted for each pattern or pattern group, with price variations for thickness; full area, stock sheets, or cut sizes; and case or lot quantities. Surface coatings for glare reduction, for example, increase the price of the glass, as do special cuts or other custom treatment or packaging. List prices by one producer in late 1970 eliminated the flat trade discount of 10 percent formerly allowed.

As shown in table 48 the list price for a representative pattern of domestic rolled glass increased moderately from 1967 through 1970. The delivered price varies with the location of the buyer. With the shift to a freight allowed basis in 1970 the list price was increased 17 percent, which is somewhat more than the amount (about 11 percent) necessary to absorb freight on an average shipment.

The pricelists of the major importers of rolled glass differ. Currently the principal agents of Japanese glass quote a delivered price (i.e., all duties, customs clearing charges, brokers' fees, port and delivery charges to customers are paid by the seller). Customers who elect to pick up the glass at the port receive a freight allowance according to a schedule published with the pricelist. A 2 percent discount for advance payment or for cash against documents is allowed. Agents for Belgian rolled glass formerly quoted c.i.f. U.S. East Coast (or West Coast) port, with customs duties, inland freight, etc., for the account of the buyer. Since September 1971, Belgian rolled glass has been quoted on c.i.f. duty-paid basis, with inland freight for the account of the buyer as before. Currently a 2 percent payments discount is allowed; formerly the payments discount was 5 percent for advance payments or 4 percent against documents. Recent trends in the published prices of West European rolled glass are shown in table 48. Prices for imported glass have increased and are currently about one-third higher than in 1967.

American users have been willing to pay a somewhat higher price for domestic glass because of the convenient ordering, prompt delivery, and services normally offered by the domestic producers, and not available on the same scale, if at all, from abroad. On sheet glass, these marketing services generally imply about a 5 percent price differential between domestic and foreign articles; the differential for rolled glass is probably of the same magnitude.

Because of the different method of treating inland freight costs, price comparisons between domestic and imported rolled glass are tenuous. Generally, when inland freight is included, the margin as shown in table 48, is 17 or 18 percent.

Unpublished price concessions on rolled glass have been offered by both U.S. producers and U.S. agents of foreign producers. Through the first half of 1969, however, U.S. producers report granting unpublished price discounts on only a small share (less than 3 percent) of shipments. Available evidence suggests that unpublished price concessions continued to play a relatively minor role in the marketing of rolled glass at least through the third quarter of 1971.

The two major U.S. rolled glass producers make sales to other manufacturers on the basis of intercompany contracts. The prices realized on these transactions are usually lower than published list prices. These sales, however, occur under special circumstances, and the lower price does not reflect competitive "discounting" (to meet either foreign or domestic competition) as the term is commonly used.

Profit-and-Loss Experience of Domestic Producers of Rolled Glass

The data reported in this section represent the financial experience of six domestic producers whose sales of rolled glass accounted for approximately 91 percent of the sales of rolled glass by U.S. producers in 1970.

All products

The aggregate value of net sales (including intracompany transfers) of all products produced in establishments 1/ in which rolled glass was produced increased from $190.5 million in 1966 to $336.7 million in 1969, and then declined to $298.4 million in 1970 (table 49). With the exception of 1968 and 1969, changes in aggregate net operating profits and in ratios of profits to net sales followed the same pattern. Aggregate net operating profits (before income taxes) increased from $30.6 million in 1966 to $59.8 million in 1968 before declining to $34.8 million in 1970. As a percent of sales, the aggregate profits averaged 16.0 percent in 1966, 17.7 percent in 1967, 18.6 percent in 1968, 16.2 percent in 1969, and 11.7 percent in 1970.

Rolled glass

The aggregate net sales (including intracompany transfers) of rolled glass for the six producers decreased from $12.8 million in 1966

1/ All operations of the establishment(s) in which plate, float, rolled, and/or polished wire glass are produced except data for PPG Industries, Inc., cover plate, float, and rolled glass only, and date for ASG Industries, Inc., excludes their plate glass operations.

to $12.4 million in 1967, increased to $12.7 million for both 1968 and 1969, and then decreased to $12.3 million in 1970 (table 49). The changes in aggregate net operating profits or losses and profit or loss ratios did not follow the same pattern of stability as that of net sales. The companies earned aggregate net operating profits ranging from $619,000 to $731,000 in 1966-68; they sustained losses of $149,000 in 1969 and $514,000 in 1970. As a percent of sales, the aggregate profit or loss (minus) was equivalent to 5.7 percent in 1966, 5.0 percent in 1967, 5.4 percent in 1968, -1.2 percent in 1969, and -4.2 percent in 1970.

Two producers 1/ sustained net operating losses from their rolled glass operations in each of the years, 1966-70. A third producer, 2/ * * * reported net operating losses on their rolled glass operations in each of the years 1967-70.

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POLISHED WIRE GLASS

U.S. Consumption

In 1967, apparent consumption of polished wire glass totaled about 34 million pounds. It increased in 1968, to 39 million pounds, declined to 36 million pounds in 1969, and to 33 million pounds in 1970. The decline appears to have been reversed in 1971; during the first half of the year, consumption was nearly 9 percent greater than in the first half of 1970 (table 51).

The decline in polished wire glass consumption occurred while consumption of other safety glazing materials, especially tempered glass, was growing. The decline reflects the generally depressed level of building activity in the sectors which utilize polished wire glass. The construction of industrial buildings, for example, declined virtually without interruption after 1966, and construction of public buildings declined each year after 1967. While commercial construction has increased since the mid-1960's the level of such construction was lower in 1970 than in the year before. Since the demand for polished wire glass is derived essentially from the construction of non-residential buildings, these developments retarded consumption. Residential construction, currently at record levels, uses relatively little polished wire glass.

U.S. Production, Shipments, and Inventories

During 1967-70, U.S. production fluctuated between 28 million pounds (in 1967) and 31 million pounds (in 1970). During the first half of 1971, however, production of polished wire glass was one-third lower than the level of production in the first half of the previous year (table 52). The decline was evident by all three U.S. producers, as shown in table 53.

Shipments were more or less in conformity with production in 1967-69, but they were 30 percent short of production in 1970, resulting in a large increase in inventory. 1/

Sales to customers, of which distributors, etc., and sash and door manufacturers, are the most important, account for most shipments. Distribution through company-owned outlets represented about * * * of shipments in recent years a considerably larger percentage than for some other flat glass products.

Intercompany transfers of polished wire glass have been generally insignificant. Once cut to size, polished wire glass is not likely to be further processed; as an exception, some small quantities may be installed in insulating units or sashes prior to shipment.

U.S. Imports

U.S. imports of polished wire glass increased from 8 million pounds in 1967 to nearly 10 million pounds in 1968. Imports in 1969 continued at essentially the same level, but they increased in 1970 to nearly 11 million pounds. During the first 6 months of 1971, they were about 15 percent above the level of the corresponding period of the previous year (table 54).

In 1970, 98 percent of polished wire glass imports came from Japan and the United Kingdom; Japan alone accounted for nearly 60 percent. Imports from the minor suppliers, the Netherlands, West Germany, and Belgium, have generally decreased since 1967.

1/ The disparity arising between shipments and production occurred almost entirely in the data reported by C-E Glass (Confidential).

During the period 1967-68 imported polished wire glass supplied 25 percent of domestic consumption. In 1969 and 1970, imports increased while domestic shipments declined so that the market share supplied by imports increased to 33 percent. During the first half of 1971, the share supplied by imports further advanced by three percentage points. In June 1971, therefore, imports supplied more than one-third of consumption, whereas, at the start of the period they had supplied about a fourth.

As mentioned earlier, the Japanese can supply wire glass in widths up to 78 inches--i.e.,--up to 18 inches wider than what is currently available from domestic sources. Pilkington Brothers of the United Kingdom also exports wire glass in widths up to 72 inches. Polished wire glass from West Germany, although imported in minor quantities is available in widths up to 120 inches. For many installations the larger sizes are particularly attractive. A 76-inch wide piece of polished wire glass can, for example, be cut into four exact door lights without any cutting loss. Significantly, the increase in imports in 1970 and in the first half of 1971 comes largely from countries (except West Germany) known to have the wider polished wire glass capability.

U.S. Exports

Polished wire glass is included in the U.S. export statistics along with plate and float glass. Trade sources, believe, however, that exports of polished wire glass are nil or negligible.

Employment in U.S. Establishments Producing Polished Wire Glass

Polished wire glass is a principal product at only one of the three factories in which it is produced. Employment figures therefore, are more representative of the aggregate operation at these facilities than of polished wire operations.

As shown in table 55 total employment at these three plants, and the number of production and related workers increased from 1967 to 1969-70. Polished wire glass, however, accounted for less than 15 percent of the man-hours worked in these plants in 1967-68, and less than 10 percent in 1969-70. Other products produced in these plants include plate and float glass, and rolled glass, as well as fabricated or semi-fabricated glass articles.

* * * is the only one in which the manufacturing of polished wire glass is a principal activity. In this plant, total employment was reduced by about * * *, between 1967 and 1970. Output per man-hour, substantially increased over the same period, from

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Data on output and man-hours for the polished wire glass industry are shown below.

U.S. production of polished wire glass, man-hours worked by production and related workers, and production per man-hour, 1967-70

Year	Production	Man-hours worked	Production per man-hour
	Million pounds	Thousands	Pounds
1967	28	382	73
1968	29	416	70
1969	28	326	86
1970	31	309	100

Production per man-hour by the major producer, which in 1967-68 was substantially less than by the two small producers (table 47), showed a marked improvement in 1969-70; output per man-hour by the other two, on the contrary, diminished. As a result, output per man-hour in 1970 at each establishment, was much nearer the industry ratio, than in previous years.

Prices and Terms of Sale

Domestic polished wire glass is sold under essentially the same terms as discussed in an earlier section on rolled glass. Until late 1970, polished wire glass was sold FOB plant, with freight equalized from the nearest competing factory. Since then, it has been sold on a "FOB, full freight allowed basis," i.e., a delivered price to the customer's warehouse. Customers who elect to pick up the glass at the factory receive a freight allowance. Customary payments discounts are provided for.

As shown in table 56 the published price of a representative thickness and size of domestic polished wire glass rose by about 20 percent from 1967 until 1971. Nearly half of the increase occurred in late 1970 with the change to a full freight allowed basis.

Imported polished wire glass, throughout most of the period was quoted on a different basis by the agents for the principal foreign suppliers. Agents for Pilkington Brothers, quoted a delivered price to customer's warehouse, with customs duties, etc., paid by the seller. An allowance was paid to those customers who elected to pick up glass at the docks. The price for Japanese glass was quoted c.i.f. duty-paid, with all customs clearing charges, delivery charges, etc. for the

customer's account. Until January 1969, however, it too was quoted on a delivered basis with customary payments discounts.

The published price for a representative type of imported polished wire glass increased after 1967 and it increased more sharply in 1971 than in previous years. In 1967-68 it was 10 to 14 percent below the price for a like domestic article, but the difference became only 5 percent in the next several years. There has been little recourse to unpublished price concessions by U.S. producers to meet foreign competition in polished wire glass.

Profit-and-Loss Experience of Domestic Producers of Polished Wire Glass

The data in this section represent the financial experience of three domestic producers of polished wire glass who accounted for virtually all domestic shipments in 1970.

All products

Net sales of all products in establishments 1/ in which polished wire glass was produced declined from $189.3 million in 1966 to $177.4 million in 1967, increased to $226.8 million in 1969, and then declined to $201.1 million in 1970 (table 57). Aggregate net operating profits (before income taxes) increased from $30.4 million in 1966 to $42.2 million in 1968, and then declined to $23.6 million in 1970. As a percent of sales, the aggregate profits averaged 16.1 percent in 1966, 17.8 percent in 1967, 19.3 percent in 1968, 14.8 percent in 1969, and 11.8 percent in 1970.

Polished wire glass

The aggregate net sales of polished wire glass for the three producers increased from about $5.8 million in 1966 and 1967 to $6.4 million in 1968, and declined thereafter to $5.6 million in 1970. Aggregate net operating profits declined from $1.5 million in 1966

1/ For Libbey-Owens-Ford Co. data cover all operations of the establishments in which plate, float, rolled, and polished wire glass are produced. For ASG Industries, Inc., and C-E Glass Co., data cover only the establishments in which polished wire glass is produced.

to about $1.4 million in 1967 and 1968, increased to $1.5 million in 1969, and then declined to $1.1 million in 1970. As a percent of sales, the aggregate profit averaged 25.7 percent in 1969, 23.7 percent in 1967, 22.5 percent in 1968, 25.0 percent in 1969, and 18.8 percent in 1970.

One producer 1/ reported a net operating loss in 1970 (table 58).

* * *

TEMPERED GLASS

U.S. Consumption

The apparent consumption of tempered glass increased irregularly from 216 million square feet in 1964 to 362 million in 1969. It declined 10 percent in 1970 but it increased in the first 6 months of 1971 to an annual rate of 453 million square feet (table 59). Seventy percent of the consumption is in automotive glass (for rear and side windows) and much of the decline in 1970 and subsequent increase is owing to the 67-day strike in the fall of 1970 against General Motors, the largest single customer. The consumption of non-automotive glass, chiefly for patio doors and other architectural use, increased progressively, from 56 million square feet in 1967 to 97 million in 1970 and occurred at the rate of 150 million square feet a year in the first 6 months of 1971.

U.S. Production and Shipments

U.S. production of tempered glass increased from 268 million square feet in 1967 to 349 million in 1968. It declined slightly in 1969 and decreased further to 316 million square feet in 1970, but it proceeded at the rate of 443 million square feet a year in the first 6 months of 1971, when it was 41 percent larger than in the corresponding months of the year before. Fluctuations in the production occur, despite a strong upward trend in the non-automotive use, because of fluctuations in automotive production.

Tempered glass is produced in the United States by 15 firms (table 60) but almost 90 percent of it is made by 7 firms which make

the raw glass used and more than 80 percent of it is made by 5 of those firms--PPG Industries; Ford Motor Co. (for its own use); Libbey-Owens-Ford; C-E Glass; and Guardian Industries.

Shipments and intracompany transfers (chiefly tempered glass made by automobile manufacturers for use in their own cars) are more-or-less equivalent to production (table 61). The closing inventory of tempered glass by producers was 28 million square feet in 1967, when it amounted to 10 percent of combined shipments and intracompany transfers, and it became about 41 million square feet in 1969 and 1970 when it was 12 and 13 percent of combined shipments and intracompany transfers. Although later data are not available, inventories are believed to have been reduced in 1971 as the lead time on deliveries was extended in the latter part of the year.

Float glass is now by far the principal kind of glass tempered (table 62). Out of a total of 403 million square feet tempered in 1970, float glass accounted for 258 million, sheet glass for 101 million, and plate and rolled glass together for 43 million (table 4). The proportion of float glass was half to two-thirds of the total in 1969 and 1970, and it became nearly three-fourths of that in January-June 1971. Most of the remainder throughout the period was sheet glass. The sheet glass consisted for the most part of that tempered by PPG Industries and C-E Glass, for patio doors and other non-automotive use. The quantity of all sheet glass tempered was presumably reduced in the second half of 1971 when C-E Glass, which had used glass manufactured by others, established its own float glass plant.

Channels of Distribution

By far the greater part of all tempered glass made, as indicated before, is automotive glass. Of the total quantity of automotive glass, amounting to 220 million to 250 million square feet a year, about 90 million square feet is made by the automobile producers themselves and used in automobiles without being sold (table 63).

* * * * * *

Three-fourths of the tempered glass for non-automotive use is made by two companies, * * * Of the total, amounting to about 100 million square feet a year, 30 to 40 percent is sold to window and door manufacturers, chiefly for use in patio doors, and nearly all the rest is divided between distributors and contractors (largely for structural use) and "other", including manufacturers of stoves, boats, illuminating products and a variety of other articles and equipment.

Factory shipments of tempered glass to customers were reduced in 1970 but in the first 6 months of 1971 were at an annual rate higher than before. The reduction in 1970 was confined to automotive glass, as shipments for non-automotive use increased in 1970 (table 64).

Ninety percent of the tempered glass shipped to customers for automotive use and 60 percent of that for non-automotive use now consists of float glass. Most of the rest consists of sheet glass.

Plate glass accounts for only 5 percent of the total and rolled glass for 4 percent.

The shipments to customers were valued at $177 million in 1969. They were valued at only $156 million in 1970, but they proceeded at the rate of $241 million a year in the first 6 months of 1971. The average unit value increased slightly, from 71 cents a square foot in 1969 to 73 cents in the first 6 months of 1971. The tempered glass for automotive use, at 78 to 82 cents a square foot, was valued somewhat above the average (58 to 62 cents) of that for other uses. The unit value differed, moreover, by kind of glass tempered. The unit value of float glass was somewhat below that of plate glass, although above that of sheet or rolled glass.

Employment

Employment in establishments making tempered glass increased from 17,779 persons in 1967 to 18,750 in 1968, but declined to 16,139 in 1970. Only about a third of the man-hours of production workers in those establishments, however, occurred on tempered glass (table 65), as most of them occurred on sheet glass or float glass that was made in the same plant.

The man-hours worked on tempered glass fluctuated without showing a definite trend between 1967 and 1970. The increase in production over this period, as shown in the following table, resulted from an increase in the output per man-hour, rather than by an increase in the man-hours worked.

Output and output per man-hour (OPMH) by production and related workers producing tempered glass, 1967-70

Year	Production	Man-hours	OPMH
	Million sq. ft.	1,000 hours	Square feet
1967	268.2	9,026	29.7
1968	349.1	11,465	30.4
1969	340.2	10,629	32.0
1970	315.5	9,860	32.0

U.S. Imports

Imports of tempered glass (table 59) increased steadily from 3 million square feet in 1965, when they accounted for 1 percent of the consumption, to the level of 22 million square feet a year in 1969 and 1970, when they accounted for 6 or 7 percent. Imports in the first 6 months of 1971 occurred at the rate of 24 million square feet a year and were 12 percent larger than in the corresponding period of 1970. They increased less than the domestic production, however, so that the proportion of imports to consumption became somewhat less than in the year before.

Approximately half of the imports enter from Canada for use as original equipment in the manufacture of automobiles, and are duty-free under the Automotive Products Trade Act of 1965. These entries include float glass shipped to Canada by U.S. producers for tempering by their Canadian subsidiaries and return. They are accompanied, moreover, by substantial exports of tempered glass to Canada from the United States.

Most of the dutiable imports are received from Belgium and Japan and consist of tempered glass in standard sizes for patio doors. Imports from the two countries increased steadily from 2 million square feet in 1967 to the rate of about 7 million square feet a year in 1970 and the first 6 months of 1971. In 1970 they amounted to about 15 percent of the consumption of tempered glass in patio doors, although only about 2 percent of the consumption in all uses.

Imports from Japan became liable to antidumping duty early in 1971 as the result of a determination in July by the Tariff Commission (by a vote of 2 to 2) that a domestic industry "is being injured by reason of the imports of tempered sheet glass from Japan sold at less than fair value". Imports would have been discouraged by the risk of antidumping duty, beginning with the suspension of appraisement in January, as well as by the eventual determination, but the potential antidumping duty, as indicated by the Treasury, was equivalent to only 6/10 of 1 percent of the delivered value of the Japanese glass.

U.S. Exports

U.S. exports of tempered glass increased annually from 2.5 million square feet in 1964 to 14.4 million square feet in 1970. As a percentage of domestic shipments, they increased from 1.1 percent in 1964 to 4.5 percent in 1970.

By far the biggest recipient of tempered glass exports has been Canada. Most tempered glass exported to Canada is for automotive purposes and a significant portion is believed to be used as original

equipment. Most tempered glass exported to other countries is also for automotive use.

Prices

The price of tempered glass to automobile companies and other manufacturers, who take by far the bulk of that sold, is negotiated and depends on a variety of considerations, including size and shape of the piece as well as the number ordered. Almost the only kind of tempered glass on which prices are regularly issued is that for patio doors, which accounts for about 12 percent of the quantity sold.

The list price by leading producers of tempered glass in the usual size for patio doors was uniform in the early part of 1971 at 42-1/2 cents a square foot, delivered anywhere in the United States except Alaska and Hawaii. Actual prices departed somewhat from list price, depending on date of order as well as other considerations. Based on a random sample of individual transactions, actual prices by producers in 1971 averaged 41 cents a square foot and were somewhat higher than in 1970, although appreciably less than in 1968.

Imported glass for patio doors was sold for 5 to 10 percent less than the domestic in most of the years 1968-71, but for only the same price as the domestic in 1970, when domestic prices were at the low point for the period. The data referred to are shown in the following table.

Tempered glass 3/16-inch thick, dimensions 34 x 76 inches for patio doors: Average delivered price by U.S. producers and importers, 1968-71

(In cents per square foot)

Item	1968	1969	1970	1971
U.S. producers	45	41	39	41
Importers	41	39	39	39

Source: Compiled from data submitted to the U.S. Tariff Commission by the producers and importers.

Profit-and-Loss Experience of Domestic Producers of Tempered Glass

The data reported in this section represents the financial experience of 11 domestic producers of tempered glass who accounted for approximately 95 percent of total shipments of tempered glass by domestic producers. 1/ Ten of the concerns furnished data for 5 years; one concern, which was sold in 1969, supplied data for the years 1966 and 1967, and one concern entered the tempering market in 1969, merging the operations of another of the concerns with its own.

Nine of the 11 concerns produced other glass products along with tempered glass, whereas 2 produced nothing but tempered glass. Seven purchased both domestically produced glass and imported glass to be used in tempering. The other 4, PPG Industries, Libbey-Owens-Ford, Fourco, and ASG Industries, used only glass manufactured in their own plants.

All products

The 11 concerns reported net sales of all products of the establishments in which tempered glass was produced, amounting to about $227 million in 1966, $218 million in 1967, $306 million in 1968, $349 million in 1969, and $339 million in 1970 (table 67).

The ratio of net operating profit (profit before adding nonoperating income, or deducting nonoperating losses and income taxes) to net

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1/ Ford Motor Co., the only other significant producer of tempered glass, did not submit profit-and-loss data.

sales was 7.3 percent in 1966, increased to 15.0 percent in 1968, and decreased to 7.4 percent in 1970. One concern reported a net operating loss in 1966, 2 in 1967, none in 1968, and 2 in 1969 and 1970.

Tempered glass

The annual sales of tempered glass by the reporting concerns rose from $133 million in 1966 to approximately $160 million in 1970 (table 68).

In 1966 the combined net operating loss on tempered glass operations was equivalent to 3.5 percent of net sales; in the other loss year, which was 1970, the operating loss was equivalent to 7.1 percent of net sales. Small profits were earned in 1967, 1968, and 1969. The operating profit percent was equivalent to three-tenths of one percent of net sales in 1967 and 1969, and 2.3 percent in 1968.

Of the 11 concerns reporting in 1966, 2 showed losses; in 1967, 3 showed losses; and in 1968 all reporting concerns showed profits. In 1969, 3 showed losses and 5 showed losses in 1970.

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Libbey-Owens-Ford uses its own glass (mainly float and plate glass) in its tempering operation and makes no outside purchases for this purpose. It transfers the glass to the tempering operation at computed market value. This is done, according to company officials, so that they can put the tempering operation on the same basis as their competitors who have to buy their glass from other manufacturers.

PPG Industries, which also makes a wide variety of glass products, accounted for * * * of the sales of tempered glass in each of the 5 years reported. The company uses its own glass in its tempering operation and transfers the glass to the tempering operation at a computed market value. It maintains the same position as LOF in regard to tempering operations, stating that by using such a method they are on a basis competitive with other tempering companies.

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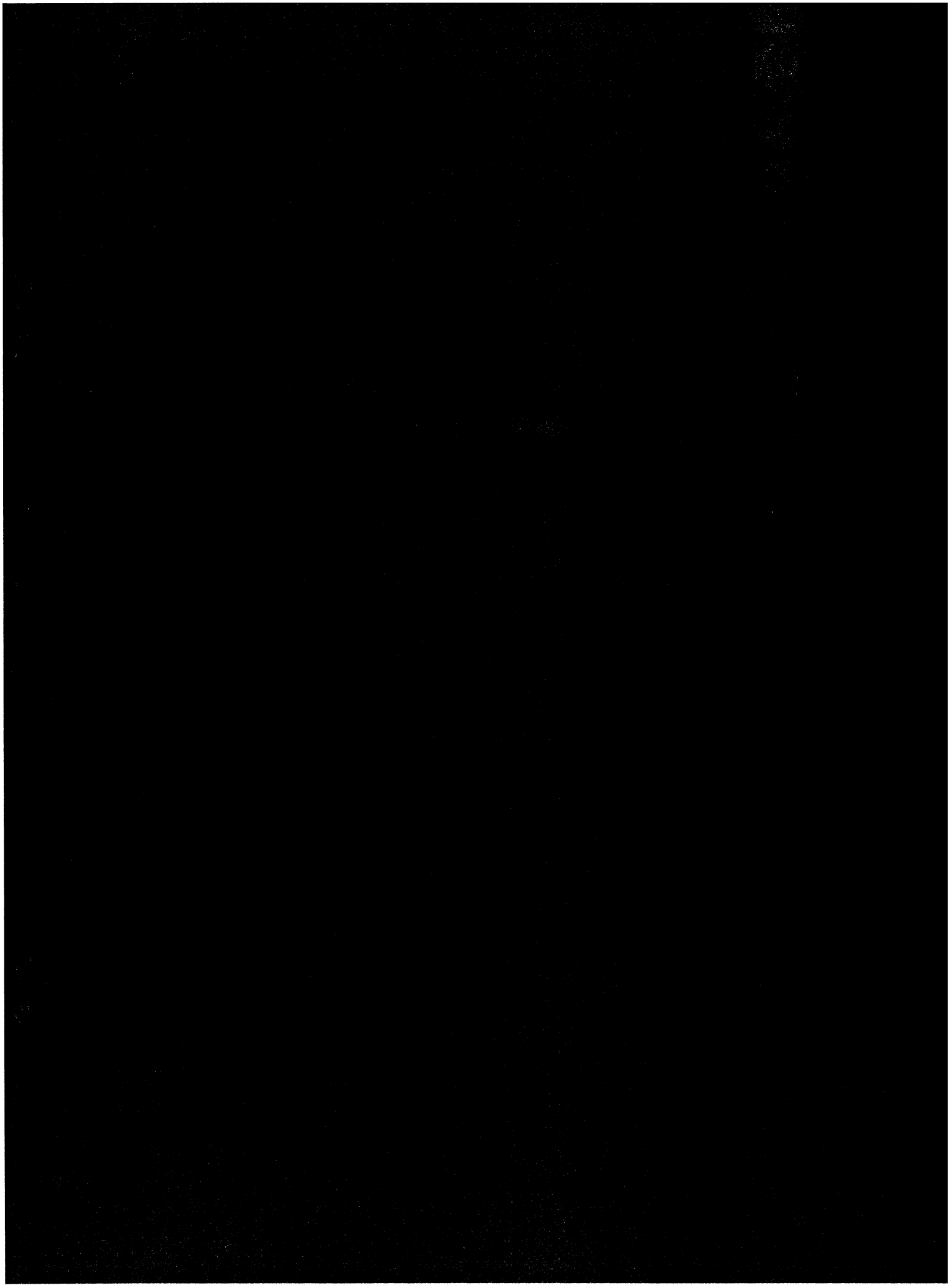

Table 1.--Rolled glass, plate and float glass, and tempered glass: U.S. rates of duty, imports for consumption in 1970 and calculated duty at the 1972 rates

TSUS item	Article	Statutory rate 1/	August 31, 1963, rate	Jan. 1, 1972 rate 2/	Imports 1970	Calculated duty at the 1972 rate	
						Amount	Ad valorem equivalent
					1,000 dollars	1,000 dollars	Percent
	Glass (whether or not containing wire netting), in rectangles, not ground, not polished and not otherwise processed, weighing over 4 oz. per sq. ft.:						
	Cast or rolled glass:						
541.11	Ordinary glass	1.5¢ per lb.	0.625¢ per lb.	0.3¢ per lb.	1,791	79	4.4
	Colored or special glass:						
541.21	Opaque and measuring over 15/64 inch in thickness	5.5¢ per lb.	1.2¢ per lb.	0.6¢ per lb.	17	1	4.7
541.31	Opaque and measuring not over 15/64 inch in thickness, or not opaque and of any thickness	1.5¢ per lb. + 5% ad val.	0.625¢ per lb. + 2.5¢ per lb.	0.3¢ per lb. + 1% ad val.	964	30	3.1
	Glass (including plate glass and float glass), whether or not containing wire netting, in rectangles, ground or polished on one or both surfaces in whole or in part, but not further processed:						
	Ordinary glass:						
543.11	Containing wire netting	23¢ per sq. ft.	6.8¢ per sq. ft.	3.8¢ per sq. ft.	2,557	103	4.0
	Not containing wire netting:						
	Measuring not over 15/32 inch in thickness:						
543.21	Not over 2-2/3 sq. ft. in area	12.5¢ per sq. ft.	3.5¢ per sq. ft.	1.7¢ per sq. ft.	279	13	4.5
543.23	Over 2-2/3 but not over 7 sq. ft. in area	17.25¢ per sq. ft.	5¢ per sq.ft.	2.5¢ per sq. ft.	1.196	83	6.9
543.27	Over 7 sq. ft. in area	19.75¢ per sq. ft.	5.6¢ per sq. ft.	2.8¢ per sq. ft.	15,411	1,095	7.1
543.31	Measuring over 15/32 inch in thickness	50% ad val.	21% ad val.	10.5% ad val.	276	29	10.5
	Colored or special glass:						
	Measuring not over 15/32 inch in thickness:						
543.61	Not over 2-2/3 sq. ft. in area	12.5¢ per sq. ft. + 5% ad val.	3.5¢ per sq. ft. + 2.5% ad val.	1.7¢ per sq. ft. + 1% ad val.	128	3	2.3
543.63	Over 2-2/3 but not over 7 sq. ft. in area	17.25¢ per sq. ft. + 5% ad val.	5¢ per sq. ft. + 2.5% ad val.	2.5¢ per sq. ft. + 1% ad val.	339	28	8.3
543.67	Over 7 sq. ft. in area	19.75¢ per sq. ft. + 5% ad val.	5.6¢ per sq. ft. + 2.5% ad val.	2.8¢ per sq. ft. + 1% ad val.	3,170	257	8.1
543.69	Measuring over 15/32 inch in thickness	55% ad val.	23.5% ad val.	11.5% ad val.	27	3	11.5
544.31	Toughened (specially tempered) glass, made of any of the glass described in items 541.11 through 544.17, whether or not shaped or framed or both	50% ad val.	22% ad val.	11% ad val.	4,451	490	11.0
544.32	If Canadian article and original motor vehicle equipment	-	-	Free 3/	15,462	0	0

1/ Rates of duty currently applicable to products of countries or areas designated as Communist dominated or controlled.
2/ Rates established pursuant to concessions granted in the 1964-67 trade conference (Kennedy Round).
3/ Duty-free status established by the Automotive Products Trade Act of 1965.

Table 1A.--Plate and float glass: U.S. imports for consumption, 1931-70, and ad valorem equivalents of the statutory and trade-agreement rates based on imports in 1970 1/

Year	Quantity	Value	Average ad valorem equivalent	Basis for change
	1,000 sq. ft.	1,000 dollars	Percent	
1931	4,852	1,105	49.7	
1932	1,149	232	49.7	
1933	561	129	49.7	
1934	213	54	49.7	
1935	59	18	35.9	Belgium.
1936	359	87	35.9	
1937	2,060	686	35.9	
1938	484	106	35.9	
1939	315	71	35.9	
1940	504	110	35.9	
1941	3	1	35.9	
1942	4	14	35.9	
1943	1	5	35.9	
1944	2/	3/	35.9	
1945	16	10	35.9	
1946	137	64	35.9	
1947	655	273	35.9	
1948	1,157	452	18.2	GATT.
1949	1,059	430	18.2	
1950	10,443	3,707	18.2	
1951	9,833	3,938	18.2	
1952	9,122	3,525	18.2	
1953	26,066	10,340	18.2	
1954	11,285	4,766	18.2	
1955	32,687	14,637	18.2	
1956	38,213	17,906	17.2	GATT.
1957	27,878	13,652	16.5	GATT.
1958	22,864	10,869	15.4	GATT.
1959	36,356	17,420	15.4	
1960	34,126	16,778	15.4	
1961	35,855	15,825	15.4	
1962	36,624	14,646	15.4	
1963	32,547	11,209	15.4	
1964	40,273	12,850	15.4	
1965	41,261	12,726	15.4	
1966	54,434	16,884	15.4	
1967	61,490	21,335	15.4	
1968	74,211	29,809	12.7	GATT.
1969	64,503	24,906	11.2	GATT.
1970	52,570	20,826	9.9	GATT.

1/ Data for the years prior to 1964 are partially estimated, based on the tariff classification established by the Tariff Schedules of the United States Annotated (TSUSA), which became effective Aug. 31, 1963.

2/ Less than 500 square feet.

3/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 1B.--Rolled glass: U.S. imports for consumption, 1931-70, and ad valorem equivalents of the statutory and trade-agreement rates based on imports in 1970 1/

Year	Quantity	Value	Average ad valorem equivalent	Basis for change
	1,000 pounds	1,000 dollars	Percent	
1931	425	29	19.8	
1932	301	16	19.8	
1933	548	21	19.8	
1934	396	17	19.8	
1935	280	9	19.8	
1936	475	15	19.8	
1937	1,039	41	19.8	
1938	759	24	19.8	
1939	928	31	19.8	
1940	622	33	19.8	
1941	388	25	19.8	
1942	2/	16	19.8	
1943	4	3/	19.8	
1944	65	5	19.8	
1945	36	2	19.8	
1946	170	15	19.8	
1947	590	55	19.8	
1948	1,295	111	10.8	GATT.
1949	332	23	10.8	
1950	1,786	89	10.8	
1951	6,540	336	10.8	
1952	10,431	535	10.8	
1953	8,882	487	10.8	
1954	10,618	585	10.8	
1955	27,822	1,419	10.8	
1956	41,716	2,407	9.3	GATT.
1957	34,799	1,772	8.9	GATT.
1958	46,634	2,479	8.4	GATT.
1959	62,708	3,618	8.4	
1960	63,693	3,588	8.4	
1961	45,111	2,771	8.4	
1962	52,865	3,350	8.4	
1963	53,057	3,436	8.4	
1964	62,299	4,617	8.4	
1965	54,322	3,782	8.4	
1966	64,041	4,128	8.4	
1967	52,877	3,701	8.4	
1968	60,726	4,304	7.3	GATT.
1969	44,331	3,589	6.7	GATT.
1970	33,157	2,772	5.7	GATT.

1/ Data for the years prior to 1964 are partially estimated, based on the tariff classification established by the Tariff Schedules of the United States Annotated (TSUSA), which became effective Aug. 31, 1963.

2/ Not available.

3/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 1C.--Polished wire glass: U.S. imports for consumption, 1931-70, and ad valorem equivalents of the statutory and trade-agreement rates based on imports in 1970 1/

Year	Quantity	Value	Average ad valorem equivalent	Basis for change
	1,000 sq. ft.	1,000 dollars	Percent	
1931	2/	3/	20.4	
1932	1	1	20.4	
1933	-	-	20.4	
1934	-	-	20.4	
1935	-	-	13.5	Belgium.
1936	2/	3/	13.5	
1937	2/	3/	13.5	
1938	1	3/	13.5	
1939	-	-	13.5	
1940	-	-	13.5	
1941	-	-	13.5	
1942	-	-	13.5	
1943	-	-	13.5	
1944	-	-	13.5	
1945	-	-	13.5	
1946	-	-	13.5	
1947	2/	3/	13.5	
1948	133	91	6.8	GATT.
1949	129	78	6.8	
1950	98	47	6.8	
1951	122	56	6.8	
1952	64	37	6.8	
1953	288	146	6.8	
1954	426	283	6.8	
1955	497	348	6.8	
1956	339	249	6.8	
1957	382	271	6.8	
1958	362	257	6.8	
1959	449	333	6.8	
1960	522	375	6.8	
1961	643	486	6.8	
1962	797	565	6.8	
1963	1,232	850	6.8	
1964	1,663	1,186	6.8	
1965	1,713	1,247	6.8	
1966	1,640	1,143	6.8	
1967	2,052	1,538	6.8	
1968	2,477	1,932	5.8	GATT.
1969	2,385	2,107	5.3	GATT.
1970	2,702	2,551	4.8	GATT.

1/ Data for the years prior to 1964 are partially estimated, based on the tariff classification established by the Tariff Schedules of the United States Annotated (TSUSA), which became effective Aug. 31, 1963.
2/ Less than 500 square feet.
3/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 1D.--Tempered glass: U.S. imports for consumption and rates of duty, 1964-70 1/

Year	Quantity	Value	Rate of duty	Basis for change
	1,000 sq. ft.	1,000 dollars		
1964	1,107	801	22% ad val.	
1965	2,922	1,636	22% ad val.	
1966	5,063	3,479	22% ad val.	
1967	9,043	4,840	22% ad val.	
1968	17,034	10,867	19.5% ad val.	GATT.
1969	22,427	17,218	17.5% ad val.	GATT.
1970	21,905	19,913	15.0% ad val.	GATT.

1/ Tempered glass was not specifically provided for in the U.S. tariff prior to the establishment of the Tariff Schedules of the United States Annotated (TSUSA), effective Aug. 31, 1963.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Sheet glass: U.S. rates of duty, imports for consumption, and calculated duty at the modified escape-action rates, 1970.

(Rates in cents per pound and percent ad valorem)

TSUS item	Article	Appendix item 1/	Statutory rate 2/	Trade agreement rate 3/	Escape-action rate: Original 4/	Escape-action rate: Modified 5/	Imports 1970	Calculated duty: Amount	Calculated duty: Ad valorem equivalent
							1,000 dollars	1,000 dollars	Percent
	Glass (including blown or drawn glass, but excluding cast or rolled glass and excluding pressed or molded glass) (whether or not containing wire netting), in rectangles, not ground, not polished and not otherwise processed, weighing over 4 oz. per sq. ft., provided for in TSUS items 542.11-.98, inclusive:								
	Ordinary glass:								
	Weighing over 4 oz. but not over 12 oz. per sq. ft.:								
542.11	Measuring not over 40 united inches		1.5¢	0.7¢	1.3¢	0.7¢	1,064	24	2.3
542.13	Measuring over 40 united inches		1.9¢	.9¢	1.6¢	.9¢	27	1	3.9
	Weighing over 12 oz. but not over 16 oz. per sq. ft.:								
542.21	Measuring not over 40 united inches		2.1¢	1.0¢	1.3¢	1.0¢	1,288	117	9.1
542.23	Measuring over 40 but not over 60 united inches		2.4¢	1.1¢	1.6¢	1.1¢	81	10	12.7
542.25	Measuring over 60 united inches		2.5¢	1.2¢	1.9¢	1.2¢	6	1	11.6
	Weighing over 16 oz. but not over 28 oz. per sq. ft.:								
542.31	Measuring not over 40 united inches	923.31	1.5¢	.7¢	1.3¢	1.1¢	2,745	491	17.9
542.33	Measuring over 40 but not over 60 united inches	923.33	1.9¢	.9¢	1.6¢	1.5¢	4,752	1,106	23.3
542.35	Measuring over 60 but not over 100 united inches	923.35	2.4¢	1.1¢	1.9¢	1.5¢	3,981	803	20.2
542.37	Measuring over 100 united inches		2.8¢	1.4¢	2.4¢	1.4¢	1,694	281	16.6
	Weighing over 28 oz. per sq. ft.:								
542.42	Not over 2-2/3 sq. ft. in area		1.5¢	.7¢	1.3¢	.7¢	1,131	132	11.7
542.44	Over 2-2/3 but not over 7 sq. ft. in area		1.9¢	.9¢	1.6¢	.9¢	1,007	132	13.1
542.46	Over 7 but not over 15 sq. ft. in area		2.4¢	1.1¢	1.9¢	1.1¢	1,259	171	13.6
542.48	Over 15 sq. ft. in area		2.8¢	1.4¢	2.4¢ or 3.5¢ 6/	1.4¢	8,252	1,349	16.4
	Colored or special glass:								
542.57	Weighing over 4 oz. but not over 12 oz. per sq. ft.		4.0¢	1.7¢	2.2¢	1.7¢	392	12	3.2
542.67	Weighing over 12 oz. but not over 16 oz. per sq. ft.		13.0¢	6.0¢	9.0¢	6.0¢	21	4	20.8
	Weighing over 16 oz. but not over 28 oz. per sq. ft.:								
542.71	Measuring not over 40 united inches	923.71	1.5¢ + 5%	0.7¢ + 2.5%	1.3¢ + 2.5%	1.1¢ + 2.5%	395	16	4.0
542.73	Measuring over 40 but not over 60 united inches	923.73	1.9¢ + 5%	0.9¢ + 2.5%	1.6¢ + 2.5%	1.5¢ + 2.5%	85	8	9.0
542.75	Measuring over 60 but not over 100 united inches	923.75	2.4¢ + 5%	1.1¢ + 2.5%	1.9¢ + 2.5%	1.5¢ + 2.5%	109	10	9.6
542.77	Measuring over 100 united inches		2.8¢ + 5%	1.4¢ + 2.5%	2.4¢ + 2.5%	1.4¢ + 2.5%	100	10	9.8
	Weighing over 28 oz. per sq. ft.:								
542.92	Not over 2-2/3 sq. ft. in area		1.5¢ + 5%	0.7¢ + 2.5%	1.3¢ + 2.5%	0.7¢ + 2.5%	274	24	8.8
542.94	Over 2-2/3 but not over 7 sq. ft. in area		1.9¢ + 5%	0.9¢ + 2.5%	1.6¢ + 2.5%	0.9¢ + 2.5%	611	67	10.9
542.96	Over 7 but not over 15 sq. ft. in area		2.4¢ + 5%	1.1¢ + 2.5%	1.9¢ + 2.5%	1.1¢ + 2.5%	523	65	12.5
542.98	Over 15 sq. ft. in area		2.8¢ + 5%	1.4¢ + 2.5%	2.4¢ + 2.5% or 3.5¢ + 2.5% 6/	1.4¢ + 2.5%	747	90	12.1

1/ The rates of duty currently applicable to glass as the result of escape-clause action are set forth in these items of the TSUS appendix.

2/ Rates of duty currently applied to the products of countries or areas designated as Communist dominated or controlled.

3/ The most recent rates of duty placed in effect as a result of concessions granted under the General Agreement on Tariffs and Trade, as modified by proclamation of the TSUS. These rates were temporarily suspended on June 17, 1962.

4/ Rates of duty placed in effect June 17, 1962, by Presidential Proclamation No. 3455 under the escape-clause procedure, as modified by proclamation of the TSUS. These rates were superseded by the rates which were placed in effect by Presidential Proclamation No. 3762 on January 11, 1967.

5/ Rates of duty placed in effect on January 11, 1967 by Presidential Proclamation No. 3762 of that date. The rates of duty applicable to TSUS appendix items 923.31, 923.33, 923.35, 923.71, 923.73, and 923.75 are higher than the trade-agreement rates and are therefore temporary. Presidential proclamation No. 3967, dated February 27, 1970, extended the period for the increased rates of duty to the close of January 31, 1972. The increased rates will then be reduced to the trade-agreement rates in three annual steps.

6/ The escape-action rate on sheet glass weighing over 28 ounces per square foot and measuring over 15 but not over 16-2/3 sq. ft. in area was 2.4¢ per lb. (plus 2.5% ad valorem if colored or special); that on sheet glass weighing over 28 oz. per sq. ft. and measuring over 16-2/3 sq. ft. in area was 3.5¢ per lb. (plus 2.5% ad valorem if colored or special).

Table 2A.--Sheet glass: U.S. imports for consumption, 1931-70, and ad valorem equivalents of the statutory and trade-agreement rates based on imports in 1970 1/

Year	Quantity	Value	Average ad valorem equivalent	Basis for change
	1,000 pounds	1,000 dollars	Percent	
1931	7,698	292	29.9	
1932	3,672	117	29.9	
1933	4,389	162	29.9	
1934	2,404	91	29.9	
1935	3,300	120	29.9	
1936	12,646	322	29.9	
1937	46,056	1,238	29.9	
1938	23,755	653	29.9	
1939	26,584	635	29.9	
1940	9,257	295	29.9	
1941	151	124	29.9	
1942	116	103	29.9	
1943	27	26	29.9	
1944	106	37	29.9	
1945	80	45	29.9	
1946	119	64	29.9	
1947	270	97	29.9	
1948	2,430	752	20.0	GATT.
1949	4,643	510	20.0	
1950	32,167	2,079	20.0	
1951	88,603	5,625	15.6	GATT.
1952	37,161	2,598	15.6	
1953	118,000	7,377	15.6	
1954	109,900	7,331	15.6	
1955	238,530	17,523	15.6	
1956	312,047	20,902	14.6	GATT.
1957	210,758	13,947	14.0	GATT.
1958	292,362	19,533	13.6	GATT.
1959	491,415	33,831	13.6	
1960	391,318	27,486	13.6	
1961	350,022	26,136	13.6	
1962	434,988	29,280	25.9	2/
1963	376,350	23,860	25.9	
1964	444,602	29,056	25.9	
1965	386,882	24,042	25.9	
1966	422,108	26,511	25.9	
1967	416,412	29,985	15.9	3/
1968	582,487	42,475	15.9	
1969	482,883	37,760	15.9	
1970	374,612	30,544	15.9	

1/ Data for the years prior to 1964 are partially estimated, based on the tariff classification established by the Tariff Schedules of the United States Annotated (TSUSA), which became effective Aug 31, 1963.

2/ Escape-action rates of duty proclaimed June 1962.

3/ Modified escape-action rates of duty, proclaimed Jan. 11, 1967.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 3.--Flat glass and tempered glass: U.S. producers' shipments, U.S. exports, U.S. imports, apparent consumption, and ratio of imports to consumption, annually 1967-70, January-June 1970, and January-June 1971

(Quantity in millions of pounds)

Item	1967	1968	1969	1970	January-June	
					1970	1971
Flat glass:						
U.S. producers' shipments	3,156.9	3,703.4	3,805.7	3,787.7	1,741.7	2,260.3
U.S. exports	110.3	78.7	90.1	108.4	56.4	58.8
U.S. imports	671.2	877.9	732.4	585.4	284.4	267.3
Apparent consumption	3,717.8	4,502.6	4,448.0	4,264.7	1,969.7	2,468.8
Ratio of imports to consumption--percent	18.0	19.5	16.5	13.7	14.4	10.8
Tempered glass:						
U.S. producers' shipments	766.0	974.0	937.0	895.0	470.0	617.0
U.S. exports	18.0	16.0	28.0	42.0	28.0	38.0
U.S. imports	26.0	48.0	63.0	62.0	42.0	49.0
Duty-free 1/	14.0	22.0	32.0	32.0	22.0	26.0
Dutiable	12.0	26.0	31.0	30.0	20.0	23.0
Apparent consumption	774.0	1,006.0	972.0	915.0	484.0	629.0
Ratio of imports to consumption--percent	3.4	4.8	6.5	6.8	8.7	7.8

1/ Imports entered duty-free under the provisions of the Automotive Products Act of 1965.

Source: Compiled from official statistics of the U.S. Department of Commerce and from information submitted to the U.S. Tariff Commission by the U.S. producers.

Table 4.--Flat glass and tempered glass: U.S. production, shipments, imports for consumption, exports, and apparent consumption, by types, 1967 and 1970

Item	Sheet glass		Plate and float glass		Rolled glass		Polished wire glass		Tempered glass	
	1967	1970	1967	1970	1967	1970	1967	1970	1967	1970
Production-----million pounds--	1,278	* * *	1,836	2,385	143	167	28	31	750	872
Shipments----------do-------	1,248		1,748	2,272	135	167	26	22	766	895
Imports----------do------	461		148	126	54	33	8	11	26	62
Exports----------do-------	11		95	99	4	5	1/	1/	18	42
Apparent consumption--do-------	1,698		1,801	2,299	185	195	34	33	774	915
Ratio of imports to consumption---------percent--	27.1		8.2	5.5	29.5	17.1	24.2	33.0	3.4	6.8

1/ Exports of polished wire glass are not separately classified; they are believed to be negligible.

Source: Compiled from official statistics of the U.S. Department of Commerce and from information submitted to the U.S. Tariff Commission by the U.S. producers.

Table 5. --Sheet glass: Shipments by U.S. producers, U.S. exports of domestic merchandise, U.S. imports for consumption, and apparent U.S. consumption, annual average 1964-1967, annually 1968-1970, and January-June 1970 and 1971

	Annual average 1964-67	1968	1969	1970	January-June 1970	January-June 1971
	Quantity (million pounds)					
Shipments by U.S. producers	1,423.4	* * *	* * *	* * *	* * *	* *
U.S. exports 1/	7.0					
U.S. imports for consumption:						
At MFN rates of duty	417.5					
At full rates	38.9					
Total imports	456.4					
Apparent U.S. consumption	1,872.9					
	Percent of U.S. consumption					
Share supplied by:						
Shipments by U.S. producers 2/	75.5	* * *	* * *	* * *	* * *	* *
U.S. imports for consumption:						
At MFN rates of duty	22.4					
At full rates	2.1					
Total imports	24.5					

1/ Official statistics are reported in square feet and have been converted to pounds at the ratio of 1 sq. ft. = 1.16 pounds.

2/ Less exports.

Source: Imports and exports compiled from official statistics of the U.S. Department of Commerce; shipments from information submitted to the U.S. Tariff Commission by the U.S. producers.

Table 6.--Sheet glass weighing over 16 but not over 28 ounces per square foot (window glass): Shipments by U.S. producers, U.S. exports of domestic merchandise, U.S. imports for consumption, and apparent U.S. consumption, annual average 1964-67, annually 1968-70, January-June 1970, and January-June 1971

Item	Annual average 1964-67	1968	1969	1970	January-June	
					1970	1971
	Quantity (million pounds)					
Shipments by U.S. producers	888.1	* * *	* * *	* * *	* * *	* * *
U.S. exports 1/	7.0					
U.S. imports for consumption:						
At MFN rates of duty						
At full rates						
Total imports	242.5					
Apparent U.S. consumption	1,123.6					
	Percent of U.S. consumption					
Share supplied by:						
Shipments by U.S. producers 2/	78.4	* * *	* * *	* * *	* * *	* * *
U.S. imports for consumption:						
At MFN rates of duty	19.1					
At full rates	2.5					
Total imports	21.6					

1/ Official statistics are reported in square feet and have been converted to pounds at the ratio of 1 sq. ft.=1.16 pounds; all exports of sheet glass are thought to be window glass.

2/ Less exports.

Source: Imports and exports compiled from official statistics of the U.S. Department of Commerce; shipments from information submitted to the U.S. Tariff Commission by the U.S. producers.

Table 7.--Heavy sheet glass: Shipments by U.S. producers, U.S. exports of domestic merchandise, U.S. imports for consumption, and apparent U.S. consumption, annual 1967-70 and January-June 1970 and 1971

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Table 8.--Thin sheet glass: Shipments by U.S. producers, U.S. exports of domestic merchandise, U.S. imports for consumption, and apparent U.S. consumption, annual 1967-70 and January-June 1970 and 1971

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Table 9.--Sheet glass: U.S. production, by company and by establishment, 1967-70, January-June 1970, and January-June 1971

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Table 10.--Sheet glass: U.S. production, shipments and intraplant transfers, and closing inventories, 1967-70, January-June 1970, and January-June 1971

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Table 11.--Sheet glass: U.S. producers' shipments and intraplant transfers, by kind, 1967-70, January-June 1970, and January-June 1971

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Table 12.--Sheet glass weighing over 16 ounces, but not over 28 ounces per square foot (window glass): U.S. shipments and intraplant transfers, 1967-70, 1967-70, January-June 1970, and January-June 1971

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Table 13.--Sheet glass: U.S. producers' sales to customers, 1968-70, and January-June 1970 and 1971

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Table 14.--Window glass: U.S. producers' sales to customers by company 1968-70 and January-June 1970 and 1971

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Table 15.--Heavy sheet glass: U.S. producers' sales to customers, by company, 1968-70 and January-June 1970 and 1971

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Table 16.--Sheet glass: U.S. factory sales to customers and intra-company transfers by type of outlet, 1970

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Table 17.--Sheet Glass: 1/ U.S. imports for consumption, by principal sources, 1967-70, and January-June 1970 and 1971

Source	1967	1968	1969	1970	January-June 1970	January-June 1971
	Quantity (1,000 pounds)					
Belgium	134,605	170,581	127,246	94,409	44,641	38,451
West Germany	52,845	72,593	70,921	58,349	29,007	17,600
Japan	50,801	56,800	45,365	35,914	22,793	14,254
Italy	26,052	56,915	45,668	40,336	20,819	7,567
Republic of China (Taiwan)	31,930	41,698	29,625	27,763	13,761	10,866
United Kingdom	36,530	48,972	41,685	16,348	9,501	5,970
France	17,131	20,692	14,167	6,837	4,627	889
Finland	9,618	15,585	18,953	12,572	6,299	7,049
Poland	12,527	13,558	13,461	12,823	3,796	11,449
Canada	3,751	3,091	13,758	6,444	130	1,259
All other	40,622	82,002	62,034	62,818	28,189	51,016
Total	416,412	582,487	482,883	374,613	183,563	166,370
Communist dominated countries	44,482	46,227	40,423	40,418	18,412	24,688
Grand total	460,894	628,714	523,306	415,031	201,975	191,058
	Value (1,000 dollars)					
Belgium	9,475	12,706	10,511	8,765	4,199	3,579
West Germany	4,791	6,400	6,498	5,908	2,919	2,030
Japan	4,313	4,844	4,072	3,181	2,017	696
Italy	1,765	4,297	3,523	3,123	1,632	1,170
Republic of China (Taiwan)	1,810	2,301	1,814	1,553	783	666
United Kingdom	2,491	3,599	3,029	1,266	730	451
France	1,818	2,018	1,452	1,045	740	243
Finland	626	1,024	1,332	896	455	479
Poland	433	528	527	601	189	527
Canada	274	282	1,357	576	15	107
All other	2,189	4,476	3,645	3,631	1,737	2,979
Total	29,985	42,475	37,760	30,545	15,416	12,927
Communist dominated countries	1,824	1,869	1,718	1,828	813	932
Grand total	31,809	44,344	39,478	32,373	16,229	13,859

1/ Includes colored glass.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 18.--Sheet glass weighing over 16, but not over 28 ounces per square foot (window glass): 1/ U.S. imports for consumption, by principal sources, 1967-70 and January-June 1970 and 1971

Source	1967	1968	1969	1970	January-June 1970	January-June 1971
	Quantity (1,000 pounds)					
Italy	21,084	40,612	35,245	30,585	14,282	12,210
West Germany	25,245	39,602	37,059	25,173	11,056	9,419
Japan	27,148	34,459	27,019	26,175	15,816	7,011
Belgium	46,360	67,028	37,935	22,788	10,844	12,390
Republic of China (Taiwan)	19,240	26,791	17,644	18,198	9,275	7,646
Finland	8,661	14,457	16,794	9,524	4,642	5,226
United Kingdom	27,379	32,808	28,159	7,168	4,155	3,082
Israel	10,778	14,625	9,818	9,399	4,877	5,043
France	9,379	12,596	6,567	1,185	859	5,039
All other	35,154	66,094	53,531	43,718	18,498	29,789
Total	230,428	349,072	269,771	193,913	94,754	96,855
Communist dominated countries	38,625	40,292	36,601	38,741	17,450	24,055
Grand total	269,053	389,364	306,372	232,654	112,204	120,910
	Value (1,000 dollars)					
Italy	1,374	2,818	2,618	2,274	1,064	982
West Germany	2,013	3,048	2,854	2,202	983	923
Japan	2,242	2,749	2,513	2,159	1,293	616
Belgium	2,911	3,026	2,619	1,938	992	975
Republic of China (Taiwan)	1,113	1,469	1,079	982	525	461
Finland	558	952	1,176	636	318	327
United Kingdom	1,637	2,293	1,983	537	304	227
Israel	505	751	522	223	252	254
France	778	970	596	248	133	181
All other	1,942	4,728	2,848	2,662	995	1,878
Total	15,073	22,804	18,808	13,861	6,859	6,824
Communist dominated countries	1,625	1,683	1,602	1,748	773	912
Grand total	16,698	24,487	20,410	15,609	7,632	7,736

1/ Dutiable in accordance with escape-clause provisions under TSUS appendix items 923.31, 923.33, 923,35, 923.71, 923.73, 923.75, and 923.77. Such imports are reported statistically in TSUSA items 542.3120-542.3770 and 542.7100-542.7700, inclusive.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 19.--Employment and man-hours worked in U.S. establishments in which sheet glass was produced, 1967-70

Item	1967	1968	1969	1970
Average number of employees:				
All employees	9,783	9,736	9,288	6,418
Production and related workers	7,989	8,046	7,668	5,268
Man-hours worked by production and related workers making:				
All products-----1,000 hours	16,692	16,559	15,866	10,389
Sheet glass-----do	12,415	12,184	12,029	10,192
Other products 1/-----do	4,277	4,375	3,837	197

1/ Predominantly on float glass at a plant withdrawn from the production of sheet glass and so not included in data for 1970.

Source: Compiled from data submitted to the U.S. Tariff Commission by U.S. producers.

Table 20.--Sheet glass: Employment and man-hours by company and by establishment, 1968-70

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Table 21.--Sheet glass: U.S. production per man-hour, by company and by establishment, 1967-70

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Table 22.--Clear sheet glass, 19 ounce, "B", 50 to 60 united inches: Delivered prices by U.S. producers on shipments in each quarter, 1969-70 and to third quarter 1971

(In cents per square foot)

Item	1969				1970				1971		
	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter
Sheet glass producers:											
ASG Industries, Inc.:											
Average price	11.1	-	10.8	10.3	10.4	9.0	10.6	10.0	10.4	10.4	12.3
Fourco Glass Co.:											
Average price	10.9	10.7	11.4	11.4	11.4	10.3	11.1	11.0	11.0	11.1	11.5
Libbey-Owens-Ford Co.:											
Average price	10.7	10.5	10.0	10.1	10.3	9.7	10.2	10.1	10.5	10.7	11.9
PPG Industries, Inc.:											
Average price	10.7	10.9	11.2	11.1	11.0	10.0	10.0	10.7	10.0	10.7	10.6
Weighted average price	10.8	10.8	10.9	10.8	10.8	9.9	10.3	10.5	10.3	10.7	11.2

Source: Computed from data submitted to the U.S. Tariff Commission by the U.S. producers.

Table 23.--Clear sheet glass, 3/16-inch, 10 to 25 square feet: Delivered prices by U.S. producers on shipments in each quarter, 1969-1970 and to third quarter 1971

(In cents per square foot)

Item	1969				1970				1971		
	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter
Sheet glass producers:											
ASG Industries, Inc:											
Average price	24.2	-	25.4	23.9	21.8	21.8	23.7	23.0	22.9	24.7	28.0
Fourco Glass Co:											
Average price	29.7	30.6	31.0	31.2	30.7	27.9	30.9	31.2	31.2	32.2	32.9
Libbey-Owens-Ford Co.:											
Average price	29.6	30.2	28.7	29.8	29.4	26.7	29.6	29.7	29.9	32.9	33.3
PPG Industries, Inc.:											
Average price	31.5	29.6	33.2	32.3	32.0	31.9	31.1	29.8	30.1	32.8	30.4
Weighted average price	29.9	29.9	31.1	30.6	28.9	29.1	29.8	29.0	29.2	30.8	30.9

Source: Computed from data submitted to the U.S. Tariff Commission by the U.S. producers.

Table 24.--Window glass, 19 ounces, 50-60 united inches: Net delivered prices of domestic and of West German, Italian and Belgian glass, 1968-71

(In cents per square foot)

Period	Domestic	West German	Italian	Belgian
1968:				
January-June	11.4	10.8	9.4	10.1
July-December	11.1	10.6	9.6	10.2
1969:				
January-June	11.5	10.6	9.7	-
July-December	11.6	11.4	9.8	11.3
1970:				
January-June	10.9	10.3	9.5	-
July-December	10.8	10.6	9.9	11.3
1971:				
January-June	11.1	10.8	10.2	12.5
July-September	11.6	12.0	10.8	11.4

Source: Compiled by U.S. Tariff Commission from data supplied by direct-factory buyers of glass.

Table 25.--Heavy sheet glass, 3/16-inch thickness, 10 to 25 square feet: Net delivered prices of domestic and of West German, Italian, and Belgian glass, 1968-71

(In cents per square foot)

Period	Domestic	West German	Italian	Belgian
1968:				
January-June	29.6	25.0	26.7	26.7
July-December	29.8	25.1	-	-
1969:				
January-June	28.4	29.8	24.9	23.3
July-December	28.7	25.8	25.0	28.3
1970:				
January-June	31.6	25.1	29.5	31.5
July-December	26.5	27.4	29.5	33.5
1971:				
January-June	24.8	32.7	30.8	30.8
July-September	25.8	-	30.4	-

Source: Compiled by U.S. Tariff Commission from data supplied by direct-factory buyers of glass.

Table 26.--Sheet Glass: Profit-and-loss experience of U.S. producers on their sheet glass operations, 1966-70 1/

Year	Net sales and intracompany transfers	Net operating profit or (loss) before income taxes	Ratio of net operating profit or (loss) to net sales
	1,000 dollars	1,000 dollars	Percent
1966	131,595	6,755	5.1
1967	* * *	* * *	* * *
1968			
1969			
1970			

1/ Includes data on all companies that produced significant quantities of sheet glass during the years under review. The reporting establishments in which sheet glass is produced are devoted almost wholly to the production of sheet glass. The data shown, therefore, are representative of the total operations of the establishments as well as sheet-glass operations alone.

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Source: Compiled from information submitted to the U.S. Tariff Commission by the U.S. producers.

Table 27.--Sheet glass: Profit-and-loss experience of U.S. producers, by companies, on their sheet glass operations for 1966-70

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Table 28.--Sheet glass: U.S. producers' average selling price, cost of sales, administrative, selling, and research expense, and net operating profit or loss, per pound sold, by companies, 1966-70

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Table 29.--Plate and float glass: 1/ Shipments by U.S. producers, U.S. exports of domestic merchandise, U.S. imports for consumption, and apparent U.S. consumption, annual 1967-70 and January-June 1970 and January-June 1971

Item	1967	1968	1969	1970	Jan.-June 1970	Jan.-June 1971
	Quantity (1,000 square feet)					
Shipments by U.S. producers:						
Plate glass	481,370	489,686	378,756	228,549	144,698	56,738
Float glass	243,140	409,376	529,420	669,313	296,123	503,247
Total	724,510	899,062	908,176	897,862	440,821	559,985
U.S. exports	37,922	26,218	31,160	39,656	21,332	23,247
U.S. imports for consumption	61,490	74,211	64,503	52,570	25,834	22,804
Apparent U.S. consumption	748,078	947,055	941,519	910,776	445,323	559,542
	Percent of U.S. consumption					
Share supplied by:						
Shipments by U.S. producers 2/	91.2	92.2	93.1	94.2	94.2	95.9
U.S. imports for consumption	8.2	7.8	6.9	5.8	5.8	4.1

1/ Excludes polished wire glass.
2/ Excludes exports.

Source: Compiled from official statistics of the U.S. Department of Commerce and from information submitted to the U.S. Tariff Commission by the U.S. producers.

Table 29(a).--Plate glass and float glass: U.S. production, intracompany transfers, factory shipments to customers, and closing inventory, 1967-1970 and January-June 1970 and 1971

(In thousands of square feet)

	1967	1968	1969	1970	Jan.-June 1970	Jan.-June 1971
Plate glass:						
Production	503,953	479,536	365,054	216,016	139,313	55,331
Intracompany transfers	308,887	299,937	222,796	105,683	79,802	15,093
Factory shipments to customers	172,483	189,749	155,960	122,866	64,896	41,645
Closing inventory	32,052	18,381	16,181	6,965	1/	1/
Float glass:						
Production	264,649	411,401	559,812	693,845	273,317	522,019
Intracompany transfers	189,316	322,248	393,466	479,411	223,975	364,294
Factory shipments to customers	53,824	87,128	135,954	189,902	72,148	138,953
Closing inventory	31,062	35,508	54,222	82,899	1/	1/
Total plate and float glass:						
Production	768,602	890,937	924,866	909,861	412,630	577,350
Intracompany transfers	498,203	622,185	616,262	585,094	303,777	379,387
Factory shipments to customers	226,307	276,877	291,914	312,768	137,044	180,598
Closing inventory	63,114	53,889	70,403	89,864	1/	1/

1/ Not available.

Source: Compiled from data submitted to the U.S. Tariff Commission by U.S. producers.

Table 29(b).--Plate glass and float glass: U.S. production by firm and plant, 1967-70, January-June 1970, and January-June 1971

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Table 29(c).--Plate glass and float glass: Factory shipments to customers, by type of glass and by firms, 1967-70, January-June 1970, and January-June 1971

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Table 30.--Plate glass and float glass: Intracompany transfers and factory shipments to customers, by kind of use and type of customer, 1969-70

(Quantity in thousands of square feet)

Item	Plate and float glass		Plate glass		Float glass	
	1969	1970	1969	1970	1969	1970
Intracompany transfer:						
For processing into:						
Laminated (except automotive glass)	2,279	4,560	2,278	4,560	1	-
Tempered (except automotive glass)	10,748	12,971	5,131	4,330	5,617	8,641
Automotive glass	577,562	542,622	194,413	84,513	383,149	458,109
Multiple-glazed insulating units	20,866	16,988	14,843	7,234	6,023	9,754
Other processed 1/	4,807	7,953	4,486	5,046	321	2,907
Total for processing	616,262	585,094	221,151	105,683	395,111	479,411
Shipped to company-owned outlets for sale	20,150	17,931	13,943	13,751	6,207	4,180
Factory shipments to customers:						
Distributors and contractors	91,114	96,488	50,422	46,537	40,692	49,951
Sash and door contractors	805	1,867	754	1,673	51	194
Automobile manufacturers	59,349	68,653	34,734	19,110	24,615	49,543
Mirror manufacturers	37,316	42,943	22,656	15,257	14,660	27,686
Other 2/	83,180	84,886	33,451	26,538	49,729	58,348
Total factory shipments to customers	271,764	294,837	142,017	109,115	129,747	185,722
Grand total	908,176	897,862	377,111	228,549	531,065	669,313

1/ Mirror manufactures, filmed glass, unclassified.

2/ Laminators (except auto manufacturers), miscellaneous fabricators, export special multiple glaze.

Source: Compiled from data submitted to the U.S. Tariff Commission by U.S. producers.

Table 31.--Plate glass and float glass: Factory shipments to customers, 1967-70 and January-June 1970-71

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Table 32.--Plate glass and float glass: U.S. production and inventory, by clear and colored, 1967-1970, and January-June 1970-71

(In thousands of square feet)

Item	1967	1968	1969	1970	Jan.-June 1970	Jan.-June 1971
Plate and float glass:						
Production	768,602	890,937	924,866	909,861	412,630	577,350
Clear	430,405	465,318	471,195	456,301	220,040	300,166
Colored	336,601	425,619	453,671	453,560	192,590	277,184
Closing inventory						
Clear	43,156	31,494	37,725	38,260	1/	1/
Colored	19,958	22,395	32,678	51,604	1/	1/
Plate glass:						
Production	503,953	479,536	365,054	216,016	139,313	55,331
Clear	261,530	243,227	192,963	116,773	70,166	34,298
Colored	240,827	236,309	172,091	99,243	69,147	21,033
Closing inventory						
Clear	16,356	10,172	6,179	3,470	1/	1/
Colored	15,696	8,209	10,002	3,495	1/	1/
Float glass:						
Production	264,649	411,401	559,812	693,845	273,317	522,019
Clear	168,875	222,091	278,232	339,528	149,874	265,868
Colored	95,774	189,310	281,580	354,317	123,443	256,151
Closing inventory						
Clear	26,800	21,322	31,546	34,790	1/	1/
Colored	4,262	14,186	22,676	48,109	1/	1/

1/ Not available.

Source: Compiled from data submitted to the U.S. Tariff Commission by U.S. producers

Table 33.--Plate and float glass: 1/ U.S. imports for consumption, by principal sources, 1965-70 and Jan.-June 1970-71

Country	1965	1966	1967	1968	1969	1970	January-June 1970	January-June 1971
	Quantity (1000 square feet)							
Japan	7,881	20,314	26,297	22,664	24,045	21,462	10,785	7,308
Belgium	18,765	17,582	17,296	17,422	16,726	11,909	6,378	4,312
France	7,813	8,309	6,098	7,752	9,267	6,750	3,792	2,169
Italy	406	1,986	4,647	9,562	3,248	3,786	1,529	2,085
West Germany	2,049	2,367	3,489	5,875	6,381	3,154	1,220	1,161
Canada	2/	240	685	8,322	55	2,446	297	3,552
United Kingdom	3,487	3,343	2,416	2,154	4,562	1,885	1,004	1,854
All other	860	293	562	460	219	1,178	729	363
Total	41,261	54,434	61,490	74,211	64,503	52,570	25,834	22,804
	Value (1000 dollars)							
Japan	2,185	5,540	8,867	8,512	9,597	8,576	4,356	3,078
Belgium	5,830	5,695	5,959	6,383	6,384	4,664	2,507	1,742
France	2,545	2,808	2,168	2,704	3,239	2,702	1,466	848
Italy	121	551	1,416	5,533	1,398	1,517	627	846
West Germany	706	1,037	1,583	2,534	2,428	1,202	440	502
Canada	3/	79	242	3,015	24	905	115	1,253
United Kingdom	1,085	1,082	896	960	1,739	828	447	700
All other	254	92	204	168	97	432	267	158
Total	12,726	16,884	21,335	29,809	24,906	20,826	10,225	9,127

1/ Excludes polished wire glass.
2/ Less than 500 square feet.
3/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 34.--Employment in establishments producing plate and float glass, 1967-70

Item	1967	1968	1969	1970
Average number of employees:				
All employees	15,769	16,429	15,103	14,271
Production and related workers	13,195	13,723	12,613	11,866
Man-hours worked by production and related workers:				
All products--1000 hours	26,460	28,715	27,111	24,781
Plate glass-------do	11,122	10,306	9,559	6,535
Float glass-------do	3,043	3,572	4,722	6,204
Other products----do	12,195	14,837	12,830	12,042

Source: Compiled from data submitted to the U.S. Tariff Commission by U.S. producers.

Table 35.--Clear plate and float glass: Published prices of two representative types, domestic, West European, and Japanese, on selected dates, 1967-71

(In square feet)

Date	Domestic	West European and Japanese	Domestic	West European and Japanese
	Glazing quality 1/		Mirror quality 2/	
May 1, 1967	$0.419	$0.407	$0.500	$0.485
Nov. 1, 1967	.451	.437	.500	.485
May 1, 1968	.451	.437	.500	.485
Nov. 1, 1968	.451	.437	.500	.485
May 1, 1969	.478	.464	.529	.513
Nov. 1, 1969	.478	.464	.529	.513
May 1, 1970	.504	.487	.470	.456
Nov. 1, 1970	.504	.557	.510	.490
May 1, 1971	3/ .481	.507	.490	.484
Nov. 1, 1971	.534	.507	.490	.484

1/ 1/4-inch, 48 x 72 inches, specified stock sheet, one size per case, in even inches, net of cash discount (cash against documents for imported glass).

2/ 1/4-inch, stock sheet, one size per case, even inches, 15-25 square feet.

3/ Ten percent discount offered off published price, effective on shipments of April 30 through June 30, 1971.

Source: Compiled from price lists obtained by the Tariff Commission. Cash discounts deducted.

Table 36.--Plate Glass: Profit-and-loss experience of domestic producers on their plate glass operations, 1966-70

Item and year	Net sales and intracompany transfers	Net operating profit before income taxes	Ratio of net operating profit to net sales
	1,000 dollars	1,000 dollars	Percent
All operations: 1/			
1966	285,174	43,447	15.2
1967	268,192	47,084	17.6
1968	318,520	58,568	18.4
1969	330,603	53,621	16.2
1970	294,543	36,281	12.3
Plate glass:			
1966	179,840	41,471	23.1
1967	151,393	30,763	20.3
1968	170,544	34,921	20.5
1969	145,953	22,002	15.1
1970	96,287	4,761	4.9

1/ For ASG Industries, Inc., all operations include data on the establishment(s) in which plate glass only is produced, for Libbey-Owens-Ford Co., all operations include data on the establishment(s) in which plate, float, rolled, and polished wire glass are produced, and for PPG Industries, Inc., data cover plate, float, and polished wire glass only.

Source: Compiled from data submitted to the U.S. Tariff Commission by the domestic producers.

Table 37.--Plate glass: Profit-and-loss experience of domestic producers, 1966-70

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Table 38. Plate glass: U.S. producers' average selling price, cost of sales, gross profit, administrative and selling expense, and net operating profit or loss, 1966-70

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Table 39.--Float glass: Profit-and-loss experience of domestic producers on their float glass operations, 1966-70

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Table 40.--Float glass: Profit-and-loss experience of domestic producers, 1966-70

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Table 41.--Float glass: U.S. producers' average selling price, cost of sales, gross profit, administrative and selling expense, and net operating profit or loss, 1966-70

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Table 42.--Rolled glass: Shipments by U.S. producers, U.S. exports of domestic merchandise, U.S. imports for consumption, and apparent consumption, 1967-70, January-June 1970, and January-June 1971

Item	1967 1/	1968 1/	1969	1970	January-June 1970	January-June 1971
	Quantity (1,000 pounds)					
Shipments by U.S. producers	134,589	152,621	166,847	166,692	83,765	79,393
U.S. exports	4,177	6,001	7,530	5,055	3,146	2,023
U.S. imports for consumption:						
At most-favored-nation rates of duty	52,877	60,726	44,331	33,157	15,455	15,967
At full rates of duty	1,591	536	406	248	248	9
Total (all rates of duty)	54,468	61,262	44,737	33,405	15,703	15,976
Apparent U.S. consumption	184,880	207,882	204,054	195,042	96,322	93,346
	Percent of U.S. consumption					
Share supplied by--						
Shipments 2/ by U.S. producers	70.5	70.5	78.1	82.9	83.7	82.9
U.S. imports for consumption:						
At most-favored-nation rates of duty	28.6	29.2	21.7	17.0	16.0	17.1
At full rates of duty	.9	.3	.2	.1	.3	3/
Total (all rates of duty)	29.5	29.5	21.9	17.1	16.3	17.1

1/ Revised.
2/ Less exports.
3/ Less than 0.05 percent.

Source: Compiled from official statistics of the U.S. Department of Commerce and from data submitted to the U.S. Tariff Commission by U.S. producers.

Table 43.--Rolled glass: U.S. production, intracompany transfers, factory shipments to customers and closing inventory 1967-70 and January-June 1970-71

Item	1967 1/	1968 1/	1969	1970	January-June	
					1970	1971
Production	142,555	146,543	154,979	166,655	85,994	73,261
Intracompany transfers	12,822	16,241	18,873	27,248	13,551	15,198
Factory shipments to customers	121,767	136,380	147,974	139,444	70,214	64,195
Closing inventory	52,936	53,089	40,867	36,423	-	-

1/ Revised.

Source: Computed from information submitted to the U.S. Tariff Commission by the U.S. producers.

Table 44.--Rolled glass: U.S. production by firm and plant, 1967-70 and January-June 1970-71

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Table 45.--Rolled glass: U.S. imports for consumption, by principal sources, 1967-70, January-June 1970, and January-June 1971

Country	1967	1968	1969	1970	January-June 1970	January-June 1971
	Quantity (1,000 pounds)					
Belgium	17,192	16,194	11,215	8,915	4,874	4,736
West Germany	5,417	6,225	7,105	4,915	2,216	2,587
Japan	12,678	14,739	9,782	5,476	1,734	2,443
Republic of China (Taiwan)	1,002	6,612	4,718	4,841	2,868	1,298
United Kingdom	3,462	3,960	3,408	2,056	506	815
Poland	11,991	11,133	7,336	3,664	1,742	1,258
All other	1,135	1,863	767	3,290	1,515	2,830
Total	52,877	60,726	44,331	33,157	15,455	15,967
Communist countries at full rates of duty	1,591	536	406	248	248	9
Grand total	54,468	61,262	44,737	33,405	15,703	15,976
	Value (1,000 dollars)					
Belgium	1,334	1,316	1,066	948	502	484
West Germany	531	675	741	579	262	281
Japan	961	1,101	822	485	156	226
Republic of China (Taiwan)	55	307	232	234	135	58
United Kingdom	358	448	426	230	74	102
Poland	405	359	236	145	71	42
All other	57	98	66	151	75	123
Total	3,701	4,304	3,589	2,772	1,275	1,316
Communist countries at full rates of duty	39	13	9	9	9	1
Grand total	3,740	4,317	3,598	2,781	1,284	1,317

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 46.--Employment in U.S. establishments in which rolled glass was produced 1/, 1967-1970

Item	1967	1968	1969	1970
Average number of employees: 2/				
All employees	1,129	1,119	1,070	3/ 1,082
Producton and related workers	899	881	886	3/ 899
Man-hours worked by production and related workers making--				
All products-----1,000 hours--	1,730	1,786	1,753	1,750
Rolled glass---------do-------	1,460	1,488	1,248	1,221
Other products	270	298	505	529

1/ Establishments producing rolled glass as a principal product.
2/ Does not include the number of employees making rough plate glass blanks
3/ Does not include the workers of Armstrong Glass Co. which ceased production in July 1970.

Source: Compiled from data submitted to the U.S. Tariff Commission by U.S. producers.

Table 47.--Output of rolled glass and output of rolled glass per man-hour (OPMH) in establishments producing rolled and polished wire glass by company and establishment, 1967-70

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Table 48.--Rolled glass: Published prices of a representative pattern, domestic f.o.b. plant, freight equalized or full freight allowed, except to far Western States, and West European c.i.f. East Coast port, on selected dates, 1967-71

Date	Domestic 1/2/	West European 1/	Margin by which the price of West European glass was lower than the price of domestic glass	
	Per sq. ft.	Per sq. ft.	Per sq. ft.	Percent
May 1, 1967	$0.291	$0.240	$0.051	17.5
Nov. 1, 1967	.291	.240	.051	17.5
May 1, 1968	.309	.240	.069	22.3
Nov. 1, 1968	.309	.252	.057	18.4
May 1, 1969	.326	.265	.061	18.7
Nov. 1, 1969	.326	.265	.061	18.7
May 1, 1970	.326	.265	.061	18.7
Nov. 1, 1970	.326	.265	.061	18.7
May 1, 1971	3/ .382	.265	.117	30.6
Nov. 1, 1971	.382	4/ .316	.066	17.3

1/ 7/32 inch, lowest priced pattern group, stock sheets, less customary payments discount.
2/ Reflects 10 percent trade discount if applicable.
3/ Pricing basis changed to full freight allowed.
4/ C.i.f. East Coast port, duty included.

Source: Calculated from pricelists obtained by the U.S. Tariff Commission.

Table 49.--Rolled Glass: Profit-and-loss experience of domestic producers on their rolled glass operations, 1966-70

Item and year	Net sales and intracompany transfers	Net operating profit or (loss) before income taxes	Ratio of net operating profit or (loss) to net sales
	1,000 dollars	1,000 dollars	Percent
All operations: 1/			
1966	190,530	30,554	16.0
1967	274,009	48,621	17.7
1968	321,464	59,796	18.6
1969	336,692	54,435	16.2
1970	298,394	34,779	11.7
Rolled glass:			
1966	12,760	731	5.7
1967	12,388	619	5.0
1968	12,699	687	5.4
1969	12,686	(149)	(1.2)
1970	12,318	(514)	(4.2)

1/ All operations of the establishment(s) in which plate, float, rolled, and/or polished wire glass are produced except data for PPG Industries, Inc., cover plate, float, and rolled glass only, and data for ASG Industries, Inc., excludes their plate glass operations.

Source: Compiled from data submitted to the U.S. Tariff Commission by the domestic producers.

Table 50.--Rolled glass: Profit-and-loss experience of domestic producers, 1966-70

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Table 51.--Polished wire glass: Shipments by U.S. producers, U.S. imports for consumption, and apparent consumption, 1967-70, January-June 1970, and January-June 1971

Item	1967 1/	1968 1/	1969	1970	January-June	
					1970	1971
	Quantity (1,000 pounds) 2/					
Shipments by U.S. products	25,720	29,412	26,824	21,916	9,732	10,256
U.S. imports for consumption 3/	8,208	9,908	9,536	10,808	4,997	5,758
Apparent U.S. consumption 4/	33,928	39,320	36,360	32,724	14,729	16,014
	Percent of U.S. consumption					
Share supplied by--						
Shipments by U.S. producers	75.8	74.8	73.8	67.0	66.1	64.0
U.S. imports for consumption	24.2	25.2	26.2	33.0	33.9	36.0

1/ Revised.

2/ Converted to pounds from square feet by using factors developed by the U.S. Tariff Commission.

3/ Does not include colored polished wire glass, which is believed to be nil or negligible. Imports shown all entered at most-favored-nation rates of duty.

4/ U.S. exports of polished wire glass are not separately classified, but they are believed to be negligible.

Source: Trade data compiled from official statistics of the U.S. Department of Commerce; shipments from information submitted to the U.S. Tariff Commission by the U.S. producers.

Table 52.--Polished wire glass: U.S. production, intracompany transfers, factory shipments to customers, and closing inventory, 1967-70 and January-June 1970 and 1971

(in thousands of pounds)

	1967 1/	1968 1/	1969	1970	January-June	
					1970	1971
Production	28,284	29,460	27,540	31,288	12,596	8,160
Intercompany transfers	-	-	52	4	4	4
Factory shipments to customers	25,720	29,412	26,772	21,912	9,728	10,252
Closing inventory 2/	7,280	4,896	5,368	9,844	-	-

1/ Revised.
2/ Includes blanks intended for polishing.

Source: Computed from information submitted to the United States Tariff Commission by the U.S. producers.

Table 53.--Polished wire glass: U.S. production by firm and plant, 1967-70 and January-June 1970-71

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Table 54.--Polished wire glass: U.S. imports for consumption by principal sources, 1967-70, January-June 1970, and January-June 1971

Country	1967	1968	1969	1970	January-June 1970	January-June 1971
	Quantity (1,000 pounds)					
Japan	6,048	6,284	5,712	6,340	2,824	2,456
United Kingdom	1,684	3,004	3,305	4,280	2,056	3,104
Netherlands	268	244	404	96	44	96
West Germany	164	148	68	36	16	8
Belgium	24	100	28	16	8	20
All other	20	128	24	40	48	72
Total	8,208	9,908	9,540	10,808	4,996	5,756
	Value (1,000 dollars)					
Japan	1,216	1,314	1,358	1,651	765	642
United Kingdom	249	539	688	871	421	645
Netherlands	37	35	38	16	8	17
West Germany	31	30	14	7	4	3
Belgium	1	8	4	3	1/	4
All other	4	6	5	3	4	13
Total	1,538	1,932	2,107	2,551	1,202	1,324

1/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerc reported in square feet.

Table 55.--Employment in U.S. establishments in which polished wire glass was produced, 1967-70

Item	1967	1968	1969	1970
Average number of employees:				
All employees	1,557	1,693	1,934	1,927
Production and related workers	1,400	1,534	1,683	1,681
Man-hour worked by production and related workers making--				
All products-----1,000 hours	2,750	2,863	3,616	3.450
Polished wire glass---do	382	416	326	309
Other products--------do	2,363	2,462	3,290	3,141

Source: Computed from data submitted to the U.S. Tariff Commission by U.S. producers.

Table 56.--Polished wire glass:--Published prices 1/4-inch, diamond mesh domestic F.O.B. plant freight equalized, or full freight allowed, except to Far Western States, and West European, c.i.f., East Coast port, duty paid, delivered to destination, on selected dates 1967-71

Date	Domestic 1/ 2/	West European 1/	Margin by which the price of W. European glass was lower than the price of domestic glass	
	Per square foot	Per square foot	Per square foot	Percent
May 1, 1967	$ 1.27	$ 1.15	$ .12	9.5
Nov. 1, 1967	1.27	1.15	.12	9.5
May 1, 1968	1.34	1.15	.19	14.2
Nov. 1, 1968	1.34	1.21	.13	9.7
May 1, 1969	1.41	1.34	.07	5.0
Nov. 1, 1969	1.41	1.34	.07	5.0
May 1, 1970	1.41	1.34	.07	5.0
Nov. 1, 1970	1.41	1.34	.07	5.0
May 1, 1971	1.53	1.45	.08	5.2
Nov. 1, 1971	1.53	1.45	.08	5.2

1/ 1/4", diamond, 10 to 25 square feet category, stock sheets less customary payments discounts.

2/ Reflects 10% trade discounts if applicable.

Source: Calculated from price lists obtained by the United STates Tariff Commission.

Table 57.--Polished wire glass: Profit-and-loss experience of domestic producers on their polished wire glass operations, 1966-70

Item and year	Net sales and intracompany transfers	Net operating profit before income taxes	Ratio of net operating profit to net sales
	1,000 dollars	1,000 dollars	Percent
All operations: 1/			
1966	189,315	30,434	16.1
1967	177,356	31,640	17.8
1968	218,144	42,177	19.3
1969	226,784	33,582	14.8
1970	201,115	23,647	11.8
Polished wire glass:			
1966	5,789	1,487	25.7
1967	5,731	1,358	23.7
1968	6,419	1,442	22.5
1969	6,135	1,536	25.0
1970	5,582	1,051	18.8

1/ All operations of the establishment(s) in which plate, float, rolled, and/or polished wire glass are produced except data for ASG Industries, Inc., cover tempered, rolled, and polished wire glass only.

Source: Compiled from data submitted to the U.S. Tariff Commission by the domestic producers.

Table 58.--Polished wire glass: Profit-and-loss experience of domestic producers, 1966-70

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Table 59.--Tempered glass: U.S. apparent consumption, shipments by producers, exports and imports, annual 1964-70 and January-June 1970 and 1971

(In million square feet)

Item	1964	1965	1966	1967	1968	1969	1970	Jan.-June 1970	Jan.-June 1971
Apparent consumption	215.9	286.7	274.4	276.3	356.0	362.4	327.1	173.4	226.9
Shipments by U.S. producers	217.3	286.6	272.5	273.5	348.3	349.7	319.6	169.9	223.9
Exports	2.5	2.8	3.2	6.2	9.3	9.7	14.4	6.9	9.2
Imports for consumption, total	1.1	2.9	5.1	9.0	17.0	22.4	21.9	10.4	12.2
APTA 2/	-	1/	2.6	4.8	7.7	11.1	11.1	5.0	6.1
All other	1.1	2.9	2.5	4.2	9.3	11.3	10.8	5.4	6.1

1/ Less than 50,000 square feet.
2/ From Canada, duty-free under the Automotive Products Trade Act.

Source: Compiled from official statistics of the U.S. Department of Commerce and from information submitted to the U.S. Tariff Commission by U.S. producers.

Table 60.--Tempered glass: U.S. production, by firm, 1967-70 and January-June 1970-71

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Table 61.--Tempered glass: U.S. production, intracompany transfers for processing, and factory shipments to customers, 1967-70 and January-June 1970 and 1971

(In thousands of square feet)

Item	1967	1968	1969	1970	January-June 1970	January-June 1971
Production, total	268,191	349,129	340,178	315,521	156,[illegible]85	221,447
Automotive	215,789	279,634	264,921	224,670	112,874	152,925
Other	52,402	69,495	75,257	90,851	43,711	68,522
Intracompany transfers for processing	1/	1/	100,635	102,105	44,590	59,005
Factory shipments to customers	1/	1/	249,033	217,547	125,363	164,880
Total, intracompany transfers for processing and factory shipments to customers	273,458	348,322	349,668	319,652	169,953	223,885

1/ Not available.

Source: Compiled from data submitted to the U.S. Tariff Commission by U.S. producers.

Table 62.--Tempered glass: Flat glass used by U.S. producers, according to source and kind, 1967-70 and January-June 1970 and 1971

(In thousands of square feet)

Source and kind	1967	1968	1969	1970	January-June	
					1970	1971
Total, all kinds	323,692	423,956	435,423	402,582	181,984	273,87
Sheet glass	87,323	116,645	113,036	101,318	49,938	57,55
Plate glass	96,607	85,610	63,835	31,476	17,127	12,59
Float glass	135,760	215,444	251,133	258,144	109,230	196,85
Rolled glass	4,002	6,257	7,419	11,644	5,689	6,86
Own manufacture, total	261,013	338,528	327,893	296,854	141,950	217,94
Sheet glass	47,043	57,474	61,909	54,878	26,652	33,92
Plate glass	87,190	82,283	54,589	21,721	12,417	6,89
Float glass	126,682	197,152	205,967	210,552	98,218	171,19
Rolled glass	98	1,619	5,428	9,703	4,663	5,93
Purchased, domestic, total	42,888	51,852	81,950	85,652	31,780	49,12
Sheet glass	25,592	37,970	28,033	29,602	15,988	17,62
Plate glass	8,692	2,587	7,624	8,830	4,323	5,70
Float glass	5,041	7,078	44,302	45,279	10,443	24,86
Rolled glass	3,563	4,217	1,991	1,941	1,026	93
Purchased, foreign, total	19,791	33,576	25,580	20,076	8,254	6,80
Sheet glass	14,688	21,201	23,094	16,838	7,298	6,00
Plate glass	725	740	1,622	925	387	
Float glass	4,037	11,214	864	2,313	569	80
Rolled glass	341	421	-	-	-	

Source: Compiled from data submitted to the U.S. Tariff Commission by the U.S. producers.

Table 63.--Tempered glass: U.S. producers' intracompany transfers and factory shipments to customers, by kind of use or type of customer, 1969-70

(In thousands of square feet)

Item	1969	1970
Intracompany transfers for processing into--		
Windows and doors	348	713
Laminated products	-	-
Automotive vehicles	91,086	90,774
Other products	5,048	5,790
Shipments to own company outlets for distribution:		
Automotive glass	3,075	3,466
Other	2,018	1,375
Shipments to non-company outlets:		
Distributors and contractors:		
Automotive glass	3,897	3,903
Other	18,993	22,885
Window and door manufacturers	30,272	37,123
Laminators (except automobile manufacturers)	190	254
Automobile manufacturers	161,643	127,238
Other	33,098	26,131
Total shipments and intracompany transfers	349,668	319,652

Source: Compiled from data submitted to the U.S. Tariff Commission by the U.S. producers.

Table 64.--Tempered glass: Factory shipments to customers, automotive use, and other, by kind of glass tempered, 1969-70, January-June 1970, and January-June 1971

Item	1969	1970	January-June 1970	January-June 1971
	Quantity (1,000 square feet)			
Total	249,033	217,547	125,363	164,880
Sheet glass	74,507	71,553	35,453	45,221
Plate glass	27,663	17,311	9,675	8,349
Float glass	139,688	118,374	75,103	104,656
Rolled glass	7,175	10,309	5,132	6,654
Automotive use, total	166,837	132,132	84,010	105,533
Sheet glass	21,633	21,340	11,092	9,026
Plate glass	17,056	5,148	3,906	1,557
Float glass	128,148	105,644	69,012	94,950
Other uses, total	82,196	85,415	41,353	59,347
Sheet glass	52,874	50,213	24,361	36,195
Plate glass	10,607	12,163	5,769	6,792
Float glass	11,540	12,730	6,091	9,706
Rolled glass	7,175	10,309	5,132	6,654
	Value (1,000 dollars)			
Total	177,337	156,386	91,224	120,357
Sheet glass	37,211	38,077	19,337	22,963
Plate glass	22,975	16,474	8,553	8,315
Float glass	114,689	98,257	61,539	86,935
Rolled glass	2,462	3,578	1,795	2,144
Automotive use, total	129,923	104,101	65,745	86,601
Sheet glass	14,410	14,326	7,526	6,568
Plate glass	11,232	3,457	2,397	1,338
Float glass	104,281	86,318	55,822	78,695
Other uses, total	47,414	52,285	25,479	33,756
Sheet glass	22,801	23,751	11,811	16,395
Plate glass	11,743	13,017	6,156	6,977
Float glass	10,408	11,939	5,717	8,240
Rolled glass	2,462	3,578	1,795	2,144

Continued

Table 64.--Tempered glass: Factory shipments to customers, automotive use, and other, by kind of glass tempered, 1969-70, January-June 1970, and January-June 1971--Continued

Item	1969	1970	January-June 1970	January-June 1971
	Unit value (per square foot)			
Total glass, average	$0.71	$0.72	$0.73	$0.73
Sheet glass	.54	.57	.58	.53
Plate glass	.83	.95	.88	1.00
Float glass	.82	.83	.82	.83
Rolled glass	.34	.35	.35	.32
Automotive use, average	.78	.79	.78	.82
Sheet glass	.67	.67	.68	.73
Plate glass	.66	.67	.61	.86
Float glass	.81	.82	.81	.83
Other uses, average	.58	.61	.62	.57
Sheet glass	.43	.47	.48	.45
Plate glass	1.11	1.07	1.07	1.03
Float glass	.90	.94	.94	.85
Rolled glass	.34	.35	.35	.32

Source: Compiled and computed from data submitted to the U.S. Tariff Commission by the U.S. producers.

Table 65.--Employment in establishments producing tempered glass, 1967-70

Item	1967	1968	1969	1970
Average number of employees:				
All employees	17,779	18,750	17,844	16,139
Production and related workers	14,537	15,474	14,976	13,360
Man-hours worked by production and related workers:				
All products----1,000 hours	29,841	32,991	31,938	28,351
Tempered glass------do	9,026	11,465	10,629	9,860

Source: Compiled from data submitted to the U.S. Tariff Commission by the U.S. producers.

Table 66.--Toughened (specially tempered) glass: U.S. imports for consumption, by principal sources, annually 1965-70, January-June 1970, and January-June 1971

Country	1965	1966	1967	1968	1969	1970	January-June 1970	January-June 1971
	Quantity (1,000 square feet)							
Canada 1/	61	2,593	4,841	7,763	11,290	11,215	5,058	6,171
Japan	47	166	562	912	4,104	4,049	2,615	1,423
Belgium	2,221	1,375	1,421	3,998	2,167	2,860	1,342	2,288
West Germany	270	435	418	989	380	490	231	286
United Kingdom	267	420	148	356	388	376	186	111
Poland	-	4	1,127	1,607	2,407	1,472	366	1,092
Republic of China (Taiwan)	-	-	91	571	807	721	152	462
All other	56	70	435	838	884	722	470	400
Total	2,922	5,063	9,043	17,034	22,427	21,905	10,420	12,233
	Value (1,000 dollars)							
Canada 1/	50	1,670	3,205	7,181	13,289	15,767	7,242	8,100
Japan	24	62	185	311	1,403	1,539	978	674
Belgium	706	449	454	1,270	635	910	423	739
West Germany	446	667	504	1,066	499	553	256	306
United Kingdom	385	592	188	438	522	439	242	144
Poland	-	1	147	202	291	180	45	127
Republic of China (Taiwan)	-	-	9	106	123	124	29	53
All other	25	38	148	293	456	401	238	205
Total	1,636	3,479	4,840	10,867	17,218	19,913	9,453	10,348

1/ Includes imports entered free of duty under the Automotive Products Trade Act as follows:

	1,000 sq. ft.	1,000 dollars		1,000 sq. ft.	1,000 dollars
1965	40	35	1970	11,079	15,767
1966	2,576	1,657	Jan.-June:		
1967	4,820	3,180	1970	5,032	7,181
1968	7,736	7,156	1971	6,076	7,921
1969	11,146	12,998			

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 67.--Profit-and-loss experience of domestic producers of tempered (specially hardened) glass, 1966-70

Item and year	Net sales and intracompany transfers	Net operating profit or (loss)	Ratio of net operating profit or (loss) to net sales
	1,000 dollars	1,000 dollars	Percent
All operations: 1/			
1966	227,150	16,679	7.3
1967	218,198	18,165	8.3
1968	306,073	45,888	15.0
1969	348,442	38,908	11.2
1970	338,949	24,986	7.4
Tempered glass:			
1966	132,889	(4,659)	(3.5)
1967	131,569	377	.3
1968	164,454	3,795	2.3
1969	180,473	642	.3
1970	160,440	(11,430)	(7.1)

1/ All operations of the establishment(s) in which tempered glass is produced except that data for PPG cover tempered-glass operations only.

Source: Compiled from information submitted to the U.S. Tariff Commission by the domestic producers.

Table 68.--Profit-and-loss experience of domestic producers, by companies, on their plant operations where tempered glass is produced and tempered glass only, 1966-70

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Appendix B

Table A.--Flat glass: U.S. production, 1967-70 and January-September 1970-71

(In millions of pounds) 1/

Description	1967	1968	1969	1970	January-September 1970	January-September 1971
Flat glass, total	3,347	3,730	3,937	3,776	2,715	3,333
Sheet glass, total	1,302	1,375	1,500	1,369	995	1,039
Window glass:						
Single strength	584	620	678	663	471	540
Double strength	255	271	285	280	205	222
Heavy sheet glass	375	400	449	376	278	257
Thin, or colored sheet glass	88	84	88	50	41	20
Plate, float, and rolled glass, total	2,045	2,355	2,437	2,407	1,720	2,294
Plate and float not over 1/8"	619	694	744	715	515	624
Plate and float, over 1/8", not over 1/4"	1,186	1,434	1,460	1,416	1,012	1,470
Plate and float, over 1/4" and rolled glass	240	227	233	276	193	200

1/ Converted from data reported in other units on the basis of 1.19 pounds per square foot (single strength equivalent) for window glass; 1.63 pounds per square foot for plate and float glass not over 1/8-inch; 3 pounds per square foot for that over 1/8-inch not over 1/4-inch, and 3.4 pounds per square foot for that over 1/4-inch in thickness and rolled glass.

Source: U.S. Bureau of the Census.

Table B.--Flat glass: Shipments by U.S. producers, 1967-70 and January-September 1970-71

Description	1967	1968	1969	1970	January-September 1970	January-September 1971
	Quantity (millions of pounds) 1/					
Flat glass, Total	2,580	2,862	3,067	2,948	2,142	2,568
Sheet glass, total	1,267	1,305	1,378	1,270	909	1,038
Window glass:						
Single strength	585	622	638	658	455	588
Double strength	249	264	277	268	190	223
Heavy sheet glass	360	363	419	312	239	205
Thin, or colored	73	56	44	32	25	22
Plate, float and rolled glass, total	1,313	1,557	1,689	1,678	1,233	1,530
Plate and float, not over 1/8"	460	545	581	547	431	504
Plate and float, over 1/8" not over 1/4"	659	828	903	919	653	852
Plate and float, over 1/4" and rolled glass	194	184	205	212	149	174
	Value (millions of dollars)					
Flat glass, total	332.0	387.5	416.8	382.9	281.5	323.7
Sheet glass, total	131.5	139.5	150.1	131.5	94.3	109.5
Window glass:						
Single strength	56.7	63.0	66.1	64.7	44.5	58.9
Double strength	26.8	29.4	31.4	28.7	20.4	24.8
Heavy sheet glass	37.5	39.0	45.6	32.6	25.0	22.2
Thin or colored	10.5	8.1	7.0	5.5	4.4	3.6
Plate, float and rolled glass, total	200.5	248.0	266.7	251.4	187.2	214.2
Plate and float, not over 1/8"	89.8	114.5	120.9	103.9	83.1	89.2
Plate and float, over 1/8" not over 1/4"	85.6	105.6	115.7	116.6	82.5	100.5
Plate and float over 1/4" and rolled glass	25.1	27.9	30.1	30.9	21.6	24.5
	Unit value (cents per pound)					
Flat glass, total	12.9	13.5	13.6	13.0	13.1	12.6
Sheet glass, total	10.4	10.7	10.9	10.4	10.4	10.6
Window glass:						
Single strength	9.7	10.1	10.4	9.8	9.8	10.0
Double strength	10.8	11.1	11.3	10.7	10.7	11.1
Heavy Sheet	10.4	10.7	10.9	10.4	10.5	10.8
Thin or colored	14.4	14.5	15.9	17.2	17.6	16.4
Plate, float and rolled glass, total	15.3	15.9	15.8	15.0	15.2	14.0
Plate and float, not over 1/8"	19.5	21.0	20.8	19.0	19.3	17.7
Plate and float, over 1/8" not over 1/4"	13.0	12.8	12.8	12.7	12.6	11.8
Plate and float over 1/4" and rolled glass	12.9	15.2	14.7	14.6	14.5	14.1

1/ Converted from data reported in other units, on the basis of 1.19 pounds per square foot (single strength equivalent) for window glass; and 1.63 pounds per square foot for plate and float glass not over 1/8-inch, 3 pounds per square foot for that over 1/8-inch not over 1/4-inch, and 3.4 pounds per square foot for that over 1/4-inch in thickness and rolled glass.

Source: U.S. Bureau of the Census.