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58-563 (1977)

USDA STATISTICAL BULLETINS

UPDATA

WOOD PRODUCTS USED IN THE CONSTRUCTION OF NONRESIDENTIAL

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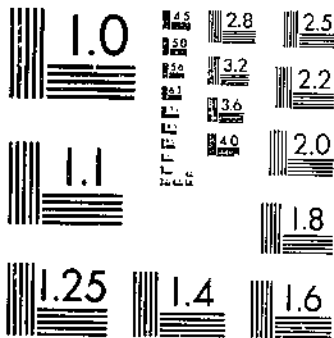
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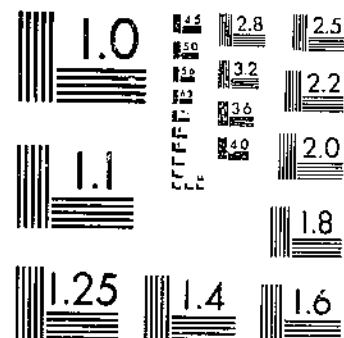
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**WOOD PRODUCTS USED IN THE CONSTRUCTION
OF NONRESIDENTIAL AND NONHOUSEKEEPING
BUILDINGS—UNITED STATES, 1961, 1969, AND 1973**

Statistical Bulletin No. 563

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WOOD PRODUCTS USED IN THE CONSTRUCTION OF NONRESIDENTIAL AND NONHOUSEKEEPING BUILDINGS—UNITED STATES, 1961, 1969, AND 1973

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with the University of Wisconsin*

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Reid, William H.

1977. Wood products used in the construction of nonresidential and nonhousekeeping buildings—United States, 1961, 1969, and 1973. U.S. Dept. Agric., Stat. Bull. No. 563, 86 p.

Estimates are presented of the amounts of lumber, glued-laminated lumber, plywood, hardboard, particleboard, insulation board, and structural wood-fiberboard used in nonresidential and nonhousekeeping building construction in the United States during 1961, 1969, and 1973. Amounts of all products are stratified by building type and structural class. In addition, lumber and plywood are stratified by region and structural component.

Requests for copies of illustrations contained in this report should be directed to Forest Products Laboratory, U.S. Department of Agriculture, Forest Service, P.O. Box 5130, Madison, Wis. 53705. Illustrations should be identified by the six-digit "M" number accompanying each.

PREFACE

This report provides estimates of the amounts of wood products used in nonresidential and non-housekeeping building construction in the United States during 1961, 1969, and 1973. Data included for analyzing trends in the use of wood products will be helpful in keeping abreast of wood product demand. This report is intended for use by market research organizations, both public and private, and others in evaluating the various factors affecting wood use in construction.

The McSweeney-McNary Act of 1928, as amended, authorizes this study. Under this Act, the Secretary of Agriculture is directed to cooperate with State and other agencies "in making and keeping current a comprehensive survey of present and prospective requirements for timber and other forest products."

Under this mandate, the first comprehensive collection of information on the use of wood products in nonresidential construction was made on the basis of the 1961 use results. According to the same plan, similar data were assembled 8 years later, on the 1969 figures. Then, because the Resources Planning Act called for it, another comparison was made 4 years later, and the 1973 figures were evaluated. Coincidentally, 1973 marked the peak year for wood products utilization in construction in the United States.

This bulletin has been prepared to help reassess the demand for wood, to establish trends, and to form a basis for projections of future requirements.

The author acknowledges the IIT Research Institute, Chicago, Ill., for data collection, and the McGraw-Hill Information Systems Company for additional services to the Forest Service.

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SUMMARY

Nonresidential and nonhousekeeping building construction activity, as measured by square feet of floor area of new construction put in place, increased from 1 billion square feet in 1961 to 1.7 billion square feet in 1973. This was an average annual increase of 4.1 percent. Construction value per square foot of floor area for all buildings increased from \$16.05 in 1961 to \$24.15 in 1973—an average annual rate of 3.5 percent.

Use of lumber per 100 square feet of floor area in building construction decreased from 141.9 board feet in 1961 to 104.3 board feet in 1973—an average annual decrease of 2.5 percent. This change appeared to be due to reduced use of lumber for facilitating purposes such as concrete formwork.

The total amount of lumber used increased from 1.5 billion board feet in 1961 to 1.8 billion board feet in 1973—an average annual increase of 1.5 percent. Lumber used for structural and millwork purposes in building construction increased at average rates of 4 and 6 percent per year, respectively, while lumber used for facilitating purposes decreased at 4 percent per year.

The volume of glued-laminated lumber used was 192 million board feet in 1969 and 185 million board feet in 1973. The reduced usage of glued-laminated lumber in 1973 was due in part to decreased construction of industrial and religious buildings.

Plywood use per square foot of floor area decreased an average of 3 percent per year between 1961 and 1973. Decreases averaged 5 and 4 percent annually in the North and South, respectively, and about 1 percent in the West.

The total amount of plywood used increased from 900 million square feet (3/8-inch basis) in 1961 to 1 billion square feet in 1973. Plywood used in structural and millwork building components increased at average annual rates of 2.6 and 7.0 percent, respectively, while plywood use for facilitating purposes decreased at the rate of 1.6 percent.

Hardboard usage increased from 42 million square feet (1/8-inch basis) in 1969 to 45 million square feet in 1973. Because hardboard use per square foot of floor area in 1973 held the same as in 1969, the indicated increase in total square footage was probably primarily due to a general increase in construction activity.

Particleboard use per 100 square feet of floor area increased from 0.86 square foot in 1969 to 1.99 square feet in 1973—an average annual increase of 23 percent. Total particleboard used was 14 million square feet (3/8-inch basis) in 1969 and 35 million square feet in 1973.

Insulation board usage amounted to 80 million square feet (1/2-inch basis) in 1969 and 77 million square feet in 1973. In 1969, 50 percent of the insulation board used in building was used in constructing industrial buildings; however, in 1973, because of increases in other construction activity, the amount of insulation board used in industrial buildings was only 38 percent of the total.

Structural wood-fiberboard used in nonresidential and nonhousekeeping building construction amounted to 185 million square feet (1-inch basis) in 1969 and 153 million square feet in 1973. Decreased structural wood-fiberboard usage reflects the reduced construction activity in industrial building during 1973.

INTRODUCTION

Wood products used in nonresidential and non-housekeeping buildings in the United States include lumber, glued-laminated lumber, plywood, hardboard, particleboard, insulation board, and structural wood-fiberboard. This Bulletin reports consumption of these products for 1961, 1969, and 1973. Consumption of lumber and plywood for these years is shown by building type (nonhousekeeping, industrial, commercial, religious, educational, hospital, and "other"), by region (North, South, and West, fig. 1), and by construction component (structural, millwork, and facilitating). These terms are explained in "Definitions." Lumber and plywood used during 1969 and 1973 are

shown by building type, region, and structural class (wood, steel/masonry, and concrete). Usage of all products is shown by building type and structural class for the years 1969 and 1973.

Factors of wood use which are shown per 100 square feet of floor area, were derived from sample surveys of buildings under contract for construction during 1961 and 1969. Average wood use factors in the tables and graphs are the quotients of the amounts of wood products used divided by floor area of construction put in place, in hundreds of square feet. Lumber, glued-laminated lumber, hardboard, insulation board, and structural wood-fiberboard use factors by building type

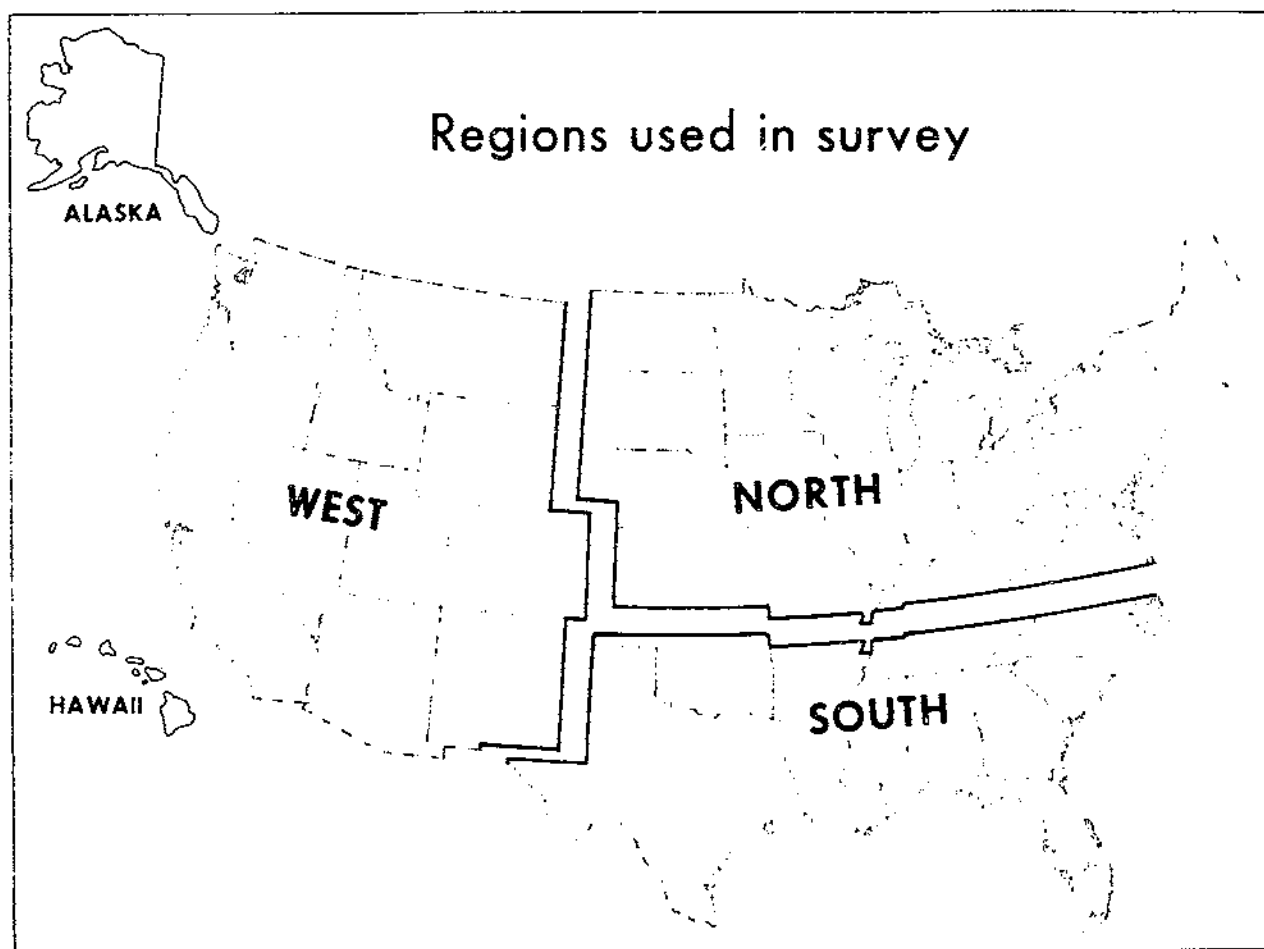


Figure 1.

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and structural class for 1969 were employed to determine total product use in 1973. Plywood and particleboard use factors for 1973 were developed from estimated changes in product use patterns between 1969 and 1973. These changes were due to increased use of particleboard in millwork and its apparent substitution for plywood.

During the 3 study years, lumber used in nonresidential and nonhousekeeping building construction consistently amounted to approximately 5 percent of all lumber consumed for all purposes in the United States. Plywood, on the other hand,

was not this consistent. Plywood used in building construction amounted to 8 percent of the plywood consumed for all purposes in 1961, 6 percent in 1969, and 4.5 percent in 1973.

About half of the lumber and plywood consumed annually for all purposes is used in building construction, including residential and nonresidential buildings. Of all lumber and plywood used in building construction, approximately 10 percent is used in constructing nonresidential and nonhousekeeping buildings.

MEASURES OF CONSTRUCTION ACTIVITY

Detailed accounts of survey procedures are presented in earlier publications.^{1,2}

Floor Area

Floor area of nonresidential and nonhousekeeping buildings constructed in the United States is shown by building type and region for 1961, 1969, and 1973, and by structural class for 1969 and 1973 (table 1).

Dodge Construction Potentials³ were adapted to estimate floor area of new construction put in place. Total floor area of nonresidential and nonhousekeeping building construction amounted to 1 billion square feet in 1961, 1.6 billion in 1969, and 1.7 billion in 1973.

Between 1961 and 1973, the amount of new floor area constructed increased at an average annual rate of 4.1 percent. During this period the floor area of new construction increased at a rate of 3.7 percent in the North, 4.7 percent in the South, and 4.3 percent in the West.

The total square footage of floor area constructed in the wood structural class in 1973 was 3 percent higher than in 1969, the steel/masonry class was 10 percent higher, and the concrete class was 6 percent higher.

Among the building types, commercial buildings increased most in floor area constructed (fig. 2),

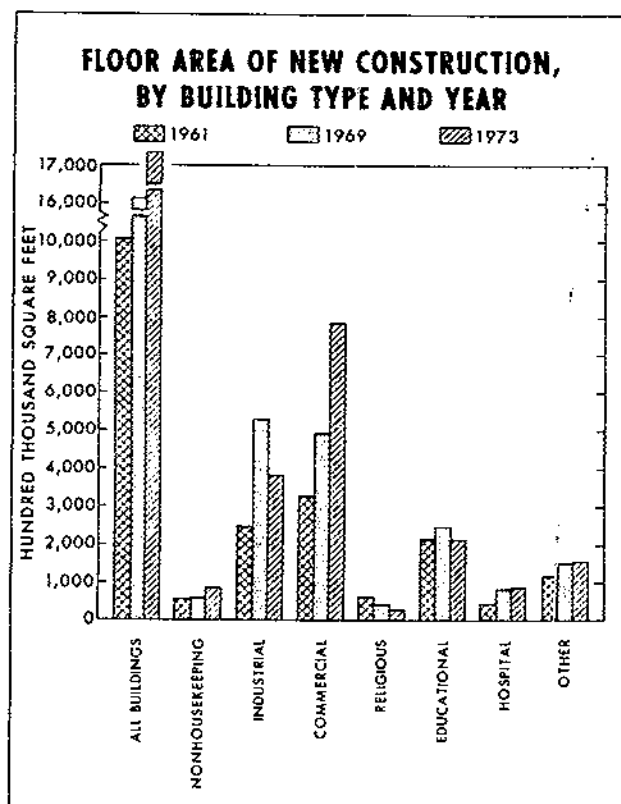


Figure 2.

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¹ Reid, W. H. and M. G. Wright. 1974. Lumber and plywood used in the construction of nonresidential and nonhousekeeping buildings in the United States, by regions, 1969. USDA For. Serv. Res. Pap. WO-24.

² Reid, W. H. and M. G. Wright. 1974. Wood products used in the construction of nonresidential and nonhousekeeping buildings—United States, 1969. U.S. Dept. Agric., Stat. Bull. 534.

³ F. W. Dodge Division. 1974. Dodge Construction Potentials for 1973. McGraw-Hill Information Systems Co., New York.

rising from 328 million square feet in 1969 to 783 million square feet in 1973. Construction of non-housekeeping, hospital, and other buildings increased slightly during this period.

Construction in the North accounted for approximately 50 to 55 percent of total floor area during the 3 selected years; in the South, 25 to 30 percent; and in the West, 20 percent (fig. 3).

Percentages of construction by region, within building types, varied. For example, in 1973, non-housekeeping building construction in the North amounted to 36 percent of total nonhousekeeping construction, and in the South, 44 percent. In 1969, educational building construction in the North amounted to 65 percent of all educational building, in the South 20 percent, and in the West 15 percent.

Construction Value

Construction value per square foot is the ratio of floor area to the value of new construction put in place as reported by the Bureau of Domestic Commerce.* Regional estimates of value of new construction put in place were derived by using contract awards as reported by F. W. Dodge Division (footnote 3) to estimate regional construction activity. Construction values represent cost of labor, materials, site preparation, and planning, including architectural and engineering fees.

The average construction value per square foot of floor area for all buildings was \$16.05 in 1961, \$20.32 in 1969, and \$24.15 in 1973 (table 2). Construction value for all buildings constructed between 1961 and 1973 increased at an average annual rate of 3.5 percent.

All building types had rising construction values between 1961 and 1973 (fig. 4). Educational buildings had the greatest increase in construction value, with an average annual rate of 6.2 percent. Buildings classified as hospitals and other had increased construction value rates of 5.7 and 4.8 percent, respectively.

*U.S. Department of Commerce, Bureau of Domestic Commerce. 1974. Construction Review 20(2) Table A-2.

PERCENTAGE OF FLOOR AREA OF NEW CONSTRUCTION, BY BUILDING TYPE, YEAR, AND REGION

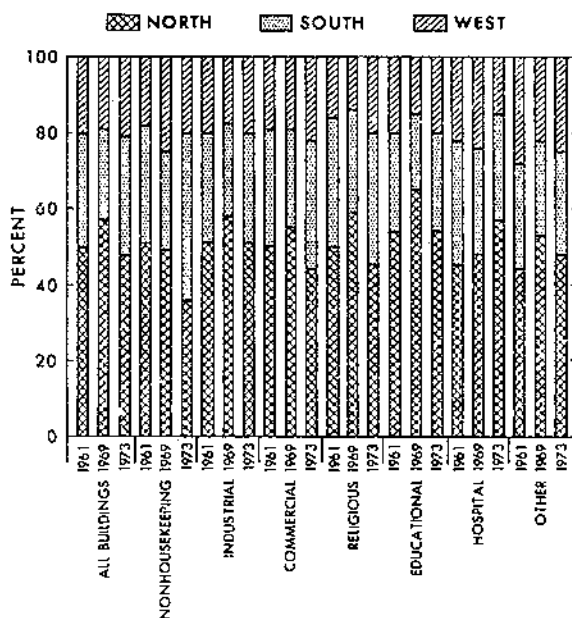


Figure 3.

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CONSTRUCTION VALUE PER SQUARE FOOT OF FLOOR AREA, BY BUILDING TYPE AND YEAR

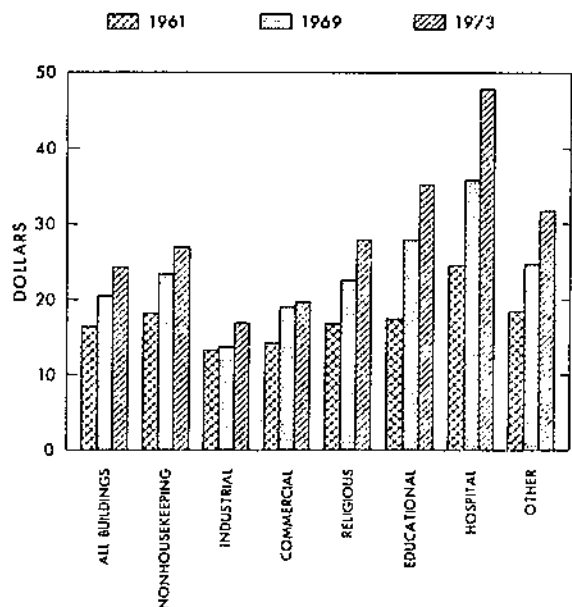


Figure 4.

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WOOD PRODUCTS USAGE

Estimates of lumber and plywood used in building construction during 1961 were based on a survey of 1,006 building projects. Wood usage data, obtained in 16 metropolitan areas through interviews with building contractors or their representatives, were classified into three categories of uses: Structural, millwork, and facilitating.

While the building types and region boundaries were the same in the 1961 and 1969 studies, the buildings in the 1961 study were not stratified into structural classes.

In the 1969 survey, wood product usage was determined by "material takeoff" from architectural drawings and specifications of 842 building projects, and by contacting the building contractors for the projects to determine the amount of wood materials required for the forming of concrete and other temporary applications. The sample of 842 building projects was selected from 5,400 projects reported in the Scan-Scope Weekly Bulletin* from July 1, 1968, to December 31, 1968.

Usage of lumber, glued-laminated lumber, hardwood, insulation board, and structural wood-fiber board in building construction in 1969 was applied to 1973 building construction floor areas to estimate 1973 wood use per 100 square feet. Particleboard and plywood usage was adjusted to reflect increased usage of particleboard in millwork during 1973 and the apparent replacement of plywood.

Amounts of lumber and plywood used in non-residential and nonhousekeeping construction are shown by building types, regions, and construction

components for 1961, 1969, and 1973, and by structural class for 1969 and 1973. Amounts of all other wood products used—glued-laminated lumber, hardboard, particleboard, insulation board, and structural wood-fiberboard—are shown by building types and structural classes for 1969 and 1973.

Some factors affecting the consumption of wood products in building construction are not easily identified and measured. For example, differences in wood product employment may be due to a number of interacting factors, such as:

- Substitutability among wood products or with a non-wood product.
- Shifts in construction activity among regions or building types.
- Total amount of construction put in place.
- Improved durability of wood products (e.g., plastic-faced plywood for concrete formwork) and improved fastening devices.
- Certain architectural styles, such as the recent revival of the mansard roof.

Lumber

All Lumber Products

Use Per 100 Square Feet of Floor Area.—Lumber use—including glued-laminated lumber—per 100 square feet of floor area for all buildings in 1961 was 142 board feet (table 3). This was about 40 board feet more than in 1969 or 1973. Lumber use in the North and South regions in 1961 was 50 to 60 board feet more than in 1969 and 1973; the West showed an increase of about 50 board feet in 1969 and 24 board feet in 1973 over lumber use in 1961.

* F. W. Dodge Division, 1968. Scan-Scope Weekly Bulletin, McGraw-Hill Information Systems Co., New York.

Among structural classes, relatively minor changes in lumber use are evident for construction in 1969 and 1973 (fig. 5). The West holds a dominant position over the other two regions in lumber use per square foot of floor area in wood and steel/masonry structural classes; in the concrete class, however, the dominance of the West is less pronounced.

Lumber use in all building types, except religious, was higher in 1961 than in 1969 or 1973 (fig. 6). Its use per square foot of floor area in constructing industrial, commercial, and other buildings decreased at an average annual rate of 2 percent; use in nonhousekeeping, educational, and hospital buildings decreased at about 3 percent; and use in religious buildings increased at a 3 percent rate.

Use of lumber among construction components—structural, millwork, facilitating—by building type and year showed relatively wide variations (table 4, fig. 7). Structural use of lumber in all buildings was about 5 percent higher in 1961 than 1973, millwork—22 percent lower, and facilitating—65 percent higher. Between 1961 and 1973, structural use of lumber per square foot of floor

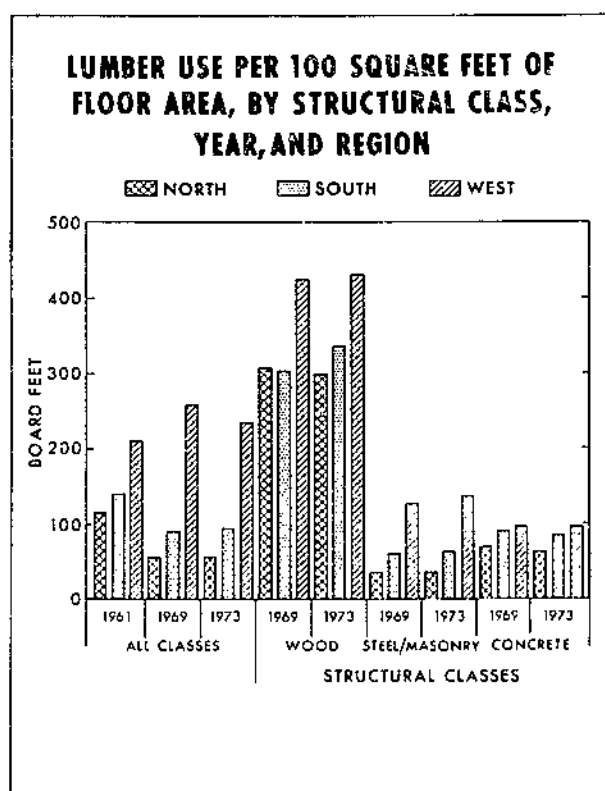


Figure 5.

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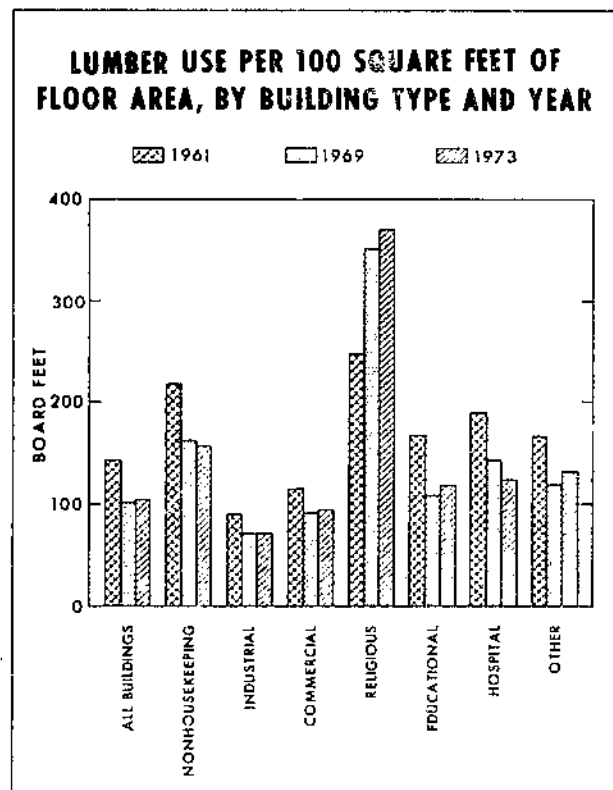


Figure 6.

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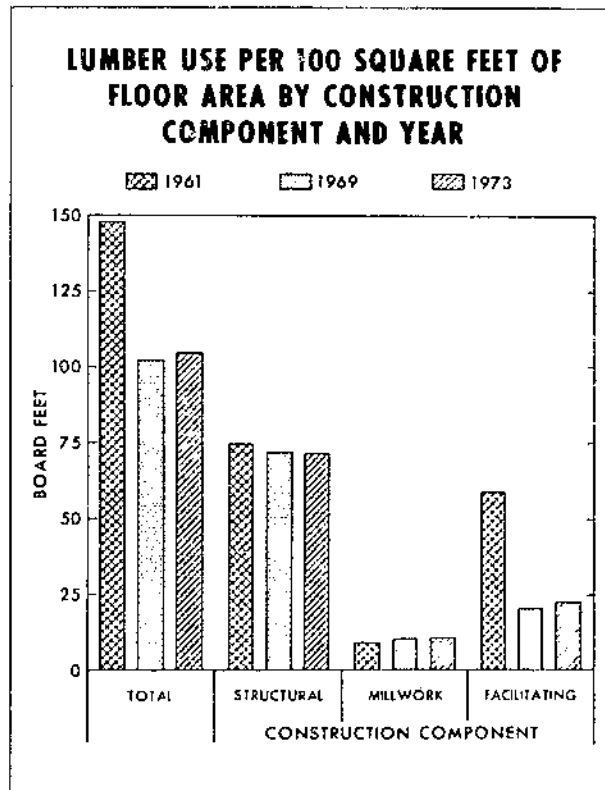


Figure 7.

M-144122

area in industrial, commercial, and educational showed only minor changes; nonhousekeeping and other buildings showed decreases; religious and hospital showed increases. Millwork use during this period increased within all building types, while facilitating use decreased within all building types.

Total Lumber Used.—Total lumber, including glued-laminated lumber, used in building construction amounted to 1.5 billion board feet, in 1961, 1.6 billion board feet in 1969 and 1.8 billion board feet in 1973 (table 5). In 1961, the North exceeded the South and West in lumber used in building construction; in 1969 and 1973, the West exceeded the other regions in lumber use (fig. 8).

During 1969 and 1973, approximately 50 percent of all lumber used in constructing buildings was in the wood structural class, 40 percent in the steel/masonry, and 10 percent in the concrete. The West accounted for almost two-thirds of the lumber used in the wood structural class. In 1969, the North accounted for almost half of the lumber used in the steel/masonry class. In 1973, however, the total lumber usage was fairly equally divided among the three regions. Variations among

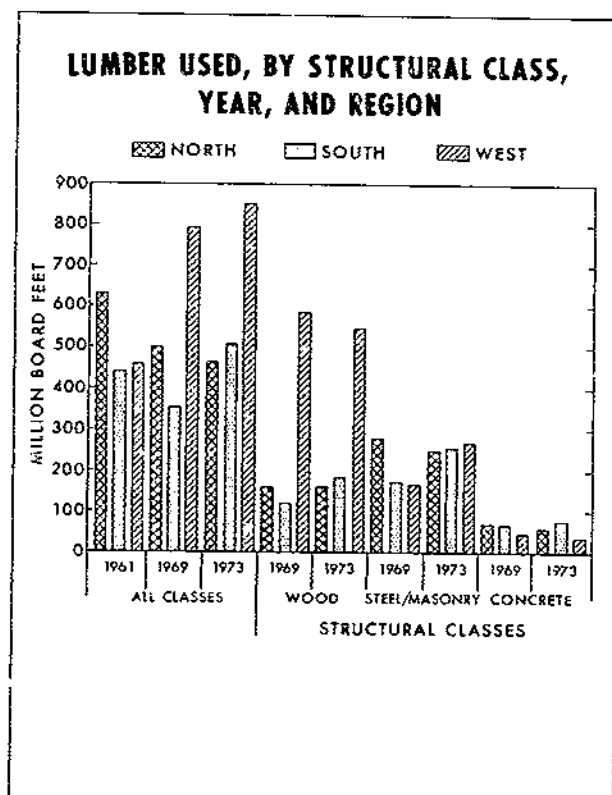


Figure 8.

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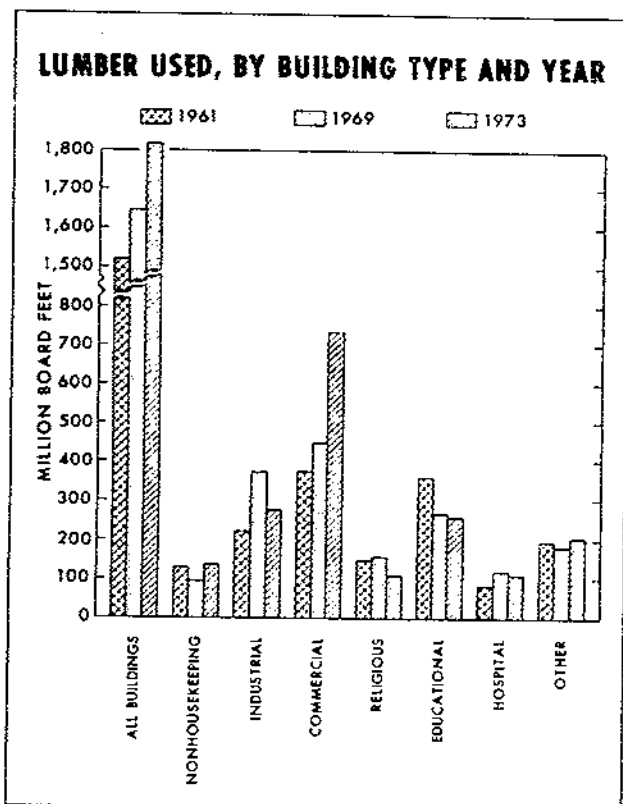


Figure 9.

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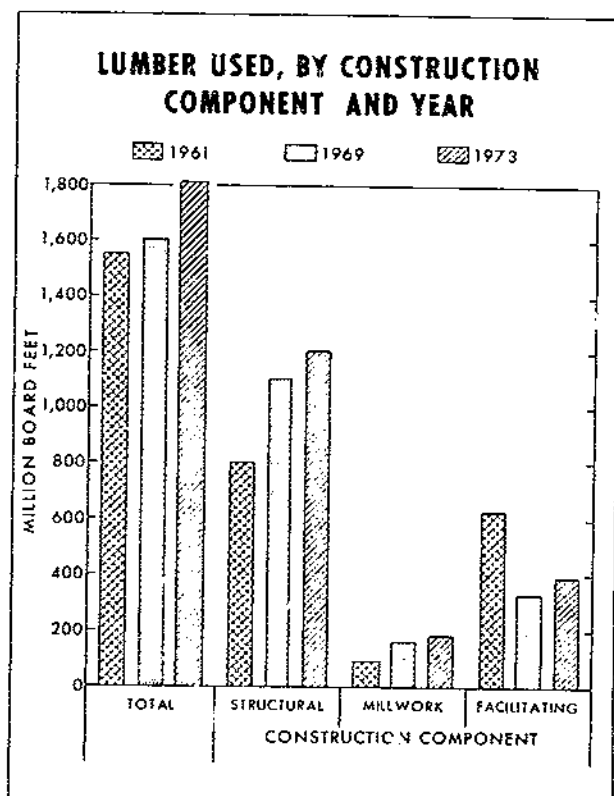


Figure 10.

M-144125

regions in lumber usage during 1969 and 1973 were due to changes in floor area constructed during the two time periods.

Industrial, commercial, and educational buildings during the 3 years (1961, 1969, and 1973) accounted for two-thirds of the lumber used in building construction (fig. 9). These three building types also showed the greatest variation in lumber used. For example, during 1961, lumber used in commercial buildings was 25 percent of the total used in all buildings; during 1973, the amount was 40 percent. Lumber used in educational buildings in 1961 was 24 percent of the total, but in 1973 it was 14 percent.

During 1961, 53 percent of the total lumber used was in the structural component of the building, 6 percent in millwork, and 41 percent in facilitating. In 1969 and 1973, roughly 70 percent was used in structural, 10 percent in millwork, and 20 percent in facilitating (table 4, fig. 10). In 1961, 42 percent of the lumber in structural components of all buildings was used in industrial and commercial buildings. During 1969 and 1973, over half

of the lumber used in structural components was in these two building types. During each of the 3 years, roughly half of the lumber used in millwork and facilitating components was in commercial and educational buildings.

Glued-Laminated Lumber

Use Per 100 Square Feet of Floor Area.—Glued-laminated lumber use per 100 square feet of floor area in all buildings amounted to 11.93 board feet in 1969 and 10.63 board feet in 1973 (table 6). Religious buildings dominated all other building types and the wood structural class dominated the structural classes in use per square foot of floor area (figs. 11 and 12).

Total Glued-Laminated Lumber Used.—Total glued-laminated lumber used in all buildings amounted to 192 million board feet in 1969 and 185 million board feet in 1973 (table 7, fig. 13). Over three-fourths of the glued-laminated lumber usage was in industrial, commercial, and other buildings, and almost all was in the wood structural class (fig. 14).

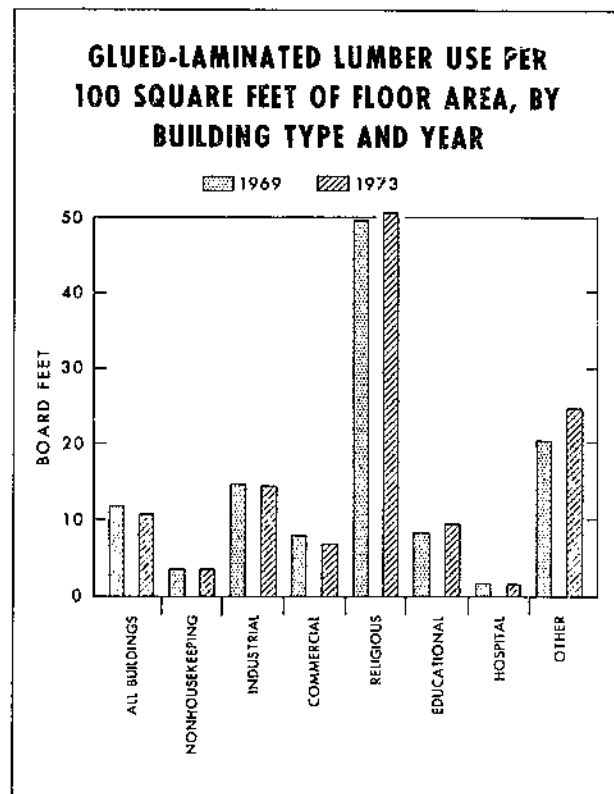


Figure 11.

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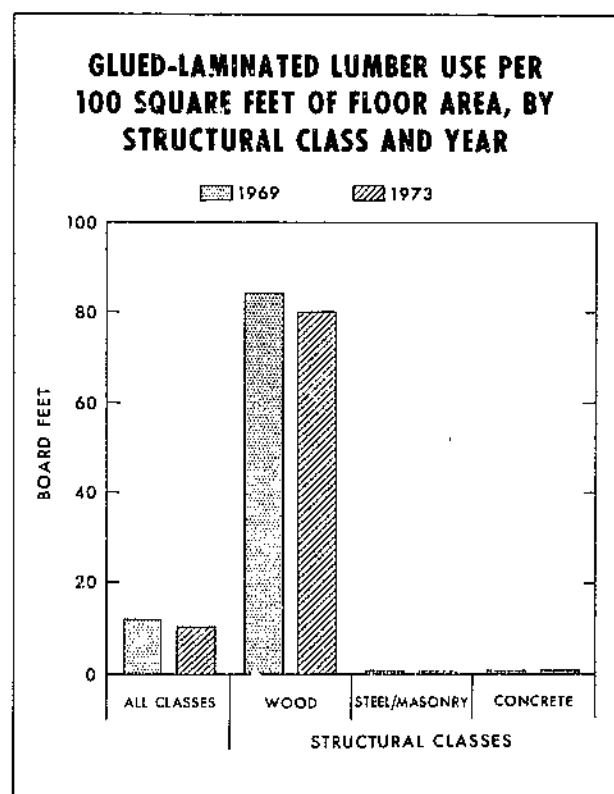


Figure 12.

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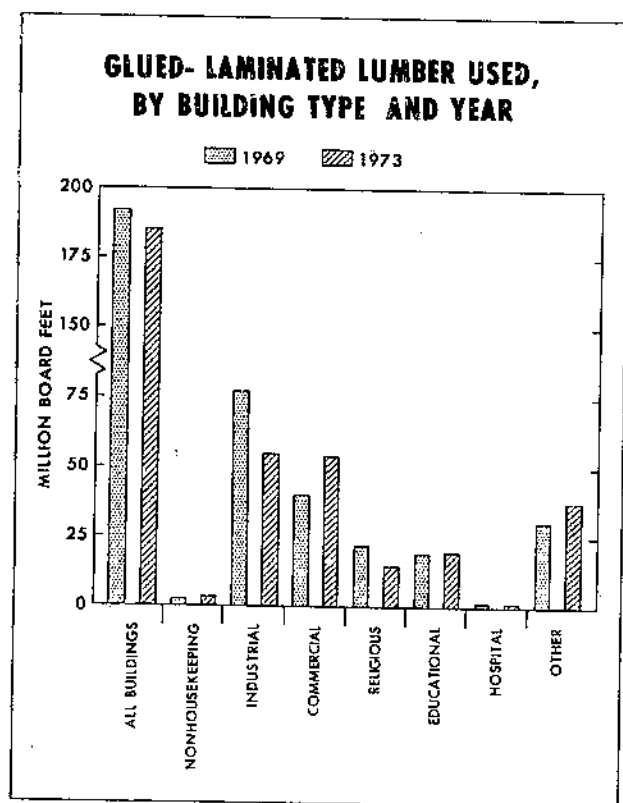


Figure 13.

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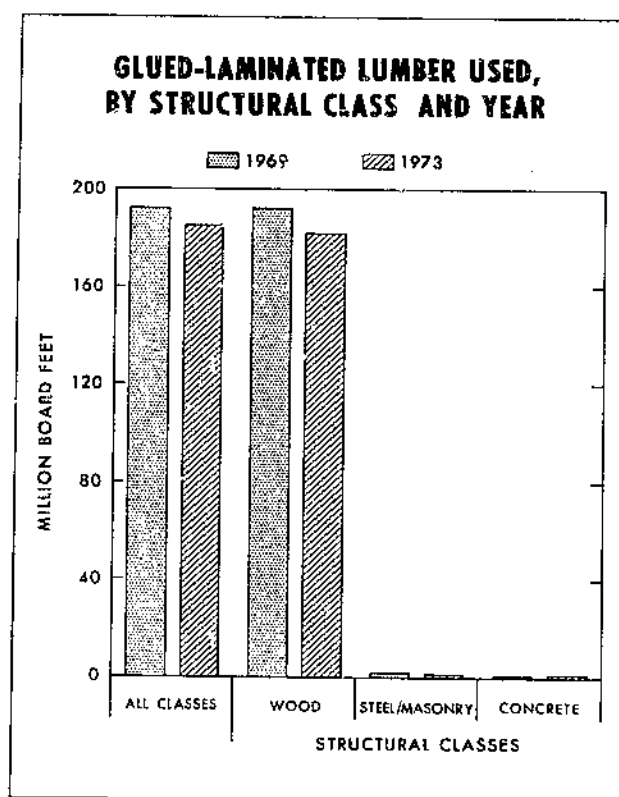


Figure 14.

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Plywood

Use Per 100 Square Feet of Floor Area ($\frac{3}{8}$ -Inch Basis)

Plywood use in all buildings constructed during 1961 amounted to 84.5 square feet per 100 square feet of floor area (table 8). This was about 25 square feet more than during 1969 or 1973. Plywood use in the North and South regions in 1961 was about 30 square feet more than in 1969 and 1973. In the West, uses for 1961 and 1969 were equal, but decreased 15 square feet in 1973 from the 2 earlier years (fig. 15).

Plywood use per square foot of floor area in industrial, commercial, educational, and other buildings was higher in 1961 than in 1969 and 1973 (fig. 16). These four building types made up over 85 percent of the total floor area constructed during each year. Use in nonhousekeeping and hospital buildings was highest in 1969, while use in religious buildings in 1969 and 1973 was double that for 1961.

Plywood use in all buildings constructed during 1961 was 84 square feet per 100 square feet of floor area, which includes the use of 29 square feet in the structural component, 7 square feet in millwork, and 48 square feet in facilitating (table 9, fig. 17). By 1969, plywood use in all buildings was 60 square feet per 100 square feet of floor area, with 25 square feet in the structural component, 11 square feet in millwork, and 24 square feet in facilitating.

Between 1961 and 1969, plywood use per square foot of floor area in the facilitating component of all building types decreased; in the structural and millwork components, use decreased only in industrial and commercial buildings. Plywood use in the millwork component of other buildings also decreased.

Total Plywood Used ($\frac{3}{8}$ -Inch Basis)

Plywood used in building construction amounted to 905 million square feet in 1961, 974 million in

1969, and 1,018 million in 1973^a (table 10). During 1961, the amounts of plywood used in the North and West regions were fairly comparable. In 1969, the West exceeded the North by over 100 million square feet and the South by 200 million. By 1973, the West exceeded both the North and South by 200 million square feet (fig. 18). During 1969 and 1973, approximately 80 percent of the total plywood used in building constructions was in the wood and steel/masonry structural classes. Plywood used in the steel/masonry class increased about 90 million square feet in 1973 over that used in 1969, while plywood used in the wood structural class decreased about 20 million square feet in 1973 from that used in 1969.

^a American Plywood Association reported over 1,600 million square feet (3/8-inch basis) of plywood used in non-residential building construction during 1974, with little change in total demand in this market since 1968. See "Softwood Plywood Used in Nonresidential Construction," Michael J. Carney, 1975. Market Research Report R-32, American Plywood Association, 1119 A Street, Tacoma, Wash. 98401.

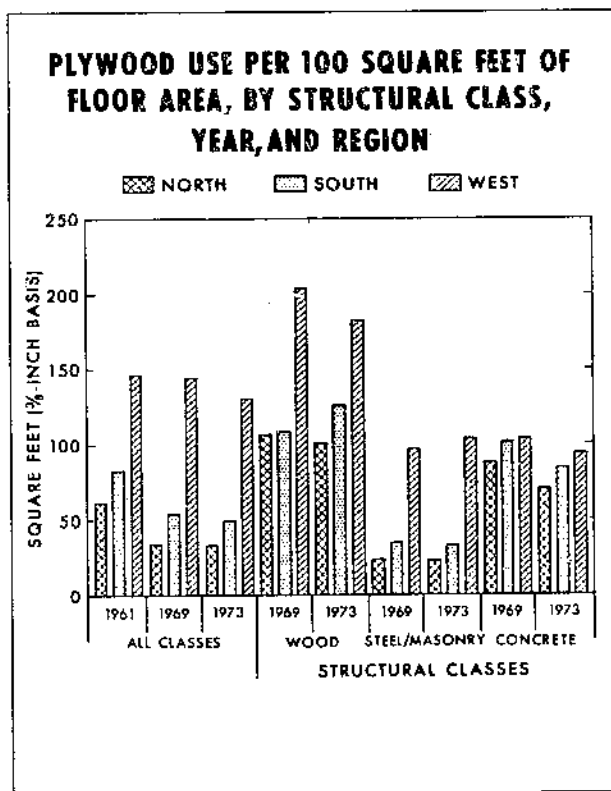


Figure 15.

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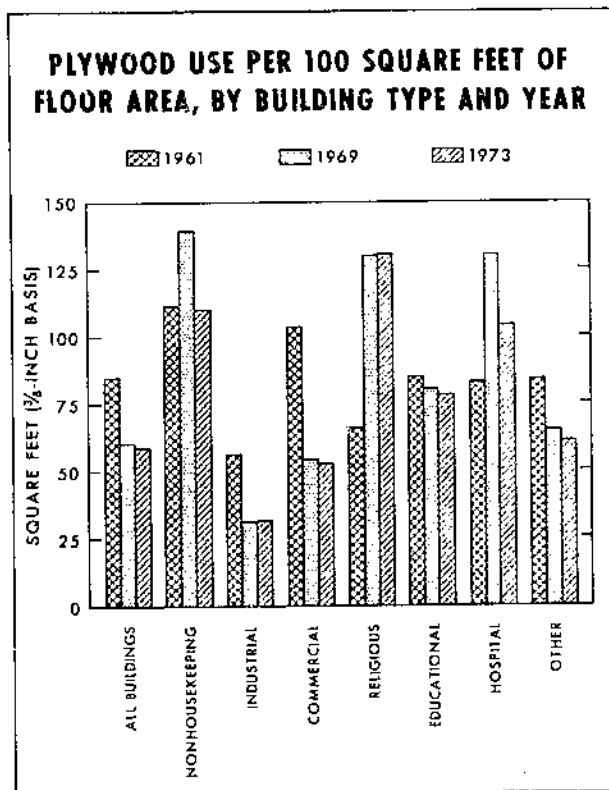


Figure 16.

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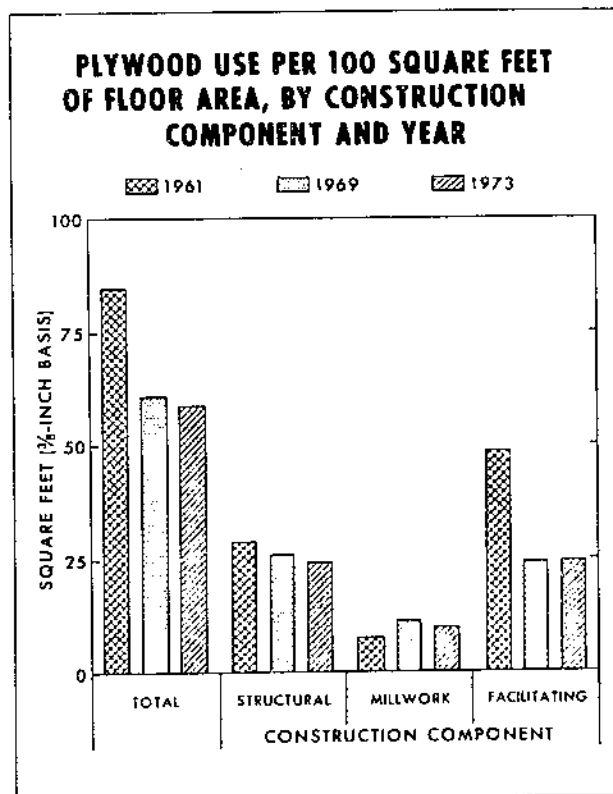


Figure 17.

M-144132

Plywood used in constructing industrial, commercial, and educational buildings accounted for approximately two-thirds of the total plywood used during the 3 study years. None of the four remaining building types accounted for more than 11 percent of the total plywood used. Total plywood used within building types had an irregular pattern during 1961, 1969, and 1973, and only the amount of plywood used in nonhouse-keeping buildings had a uniform upward trend (fig. 19).

During 1961, 34 percent of the total plywood used was in the structural component of the buildings, 7 percent in millwork, and 58 percent in facilitating; in 1969 and 1973, approximately 40 percent was used in structural, 20 percent millwork, and 40 percent facilitating (table 9, fig. 20). During each of the 3 study years, at least half of the plywood used in the structural component was in commercial and industrial buildings, and over half of the plywood used in the facilitating component was in commercial and educational buildings.

PLYWOOD USED, BY STRUCTURAL CLASS, YEAR, AND REGION

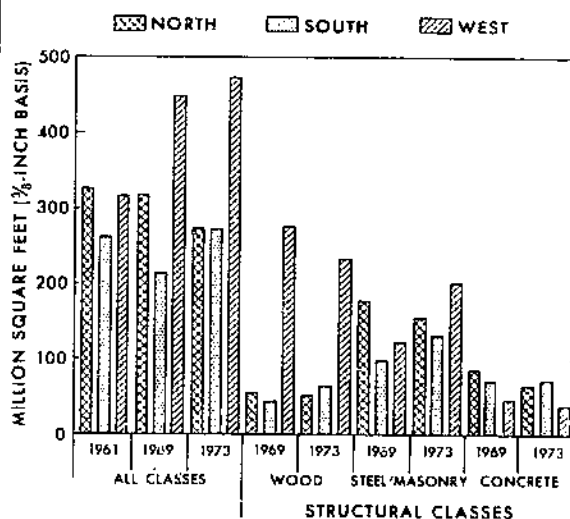


Figure 18.

M-144133

PLYWOOD USED, BY BUILDING TYPE AND YEAR

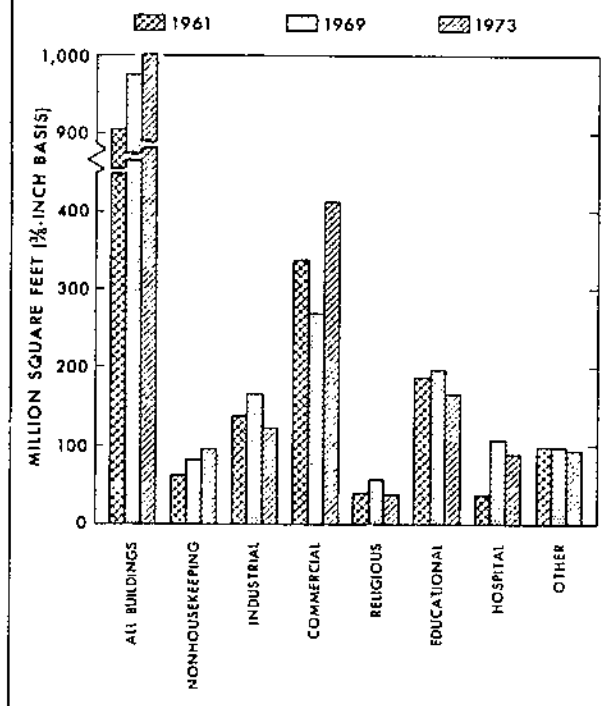


Figure 19.

M-144134

PLYWOOD USED, BY CONSTRUCTION COMPONENT AND YEAR

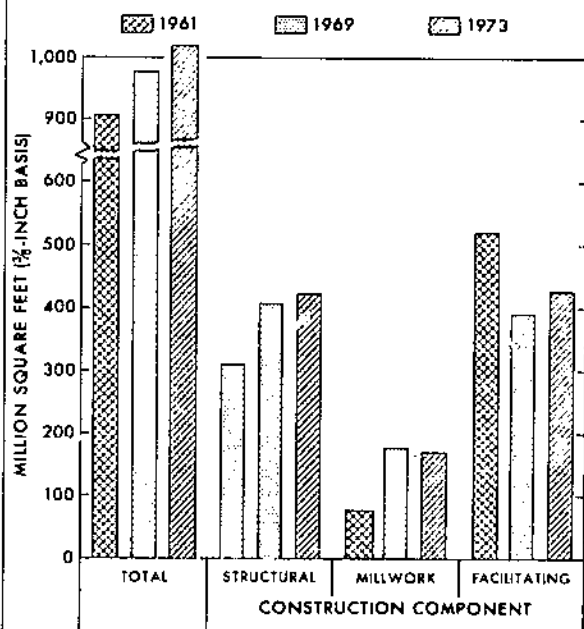


Figure 20.

M-144135

Hardboard

Use Per 100 Square Feet of Floor Area ($\frac{1}{8}$ -Inch Basis)

Hardboard use per 100 square feet of floor area in all building types amounted to 2.6 square feet in 1969 and 1973 (table 11). Among the structural classes, total use per 100 square feet of floor area was highest in the wood class, and use in 1973 was about 8 percent higher than in 1969 (fig. 21). Use per 100 square feet of floor area in the concrete class in 1973 decreased about 16 percent from that in 1969. Hardboard use in nonhousekeeping and educational buildings exceeded that in all other buildings during 1969 and 1973, and ranged from 6.6 to 8.5 square feet (fig. 22). Hardboard in religious and hospital buildings averaged about 4 square feet; commercial and "other" buildings averaged about 2 square feet; and industrial buildings averaged less than 1 square foot.

Total Hardboard Used ($\frac{1}{8}$ -Inch Basis)

Total hardboard used in the construction of all buildings amounted to 42 million square feet in 1969 and 45 million square feet in 1973 (table 12). Between 1969 and 1973, the total amounts of hardboard used in the wood and steel/masonry structural classes increased 11 percent, while usage in the concrete class decreased 11 percent (fig. 23). Approximately 60 percent of the total hardboard was used in commercial and educational buildings (fig. 24). The amount used in commercial buildings in 1973 increased 53 percent over 1969. Hardboard used in nonhousekeeping buildings also increased by 42 percent, but usage in industrial and educational buildings decreased 29 and 14 percent, respectively. Total hardboard used in religious, hospital, and other buildings was fairly uniform during the 2 years.

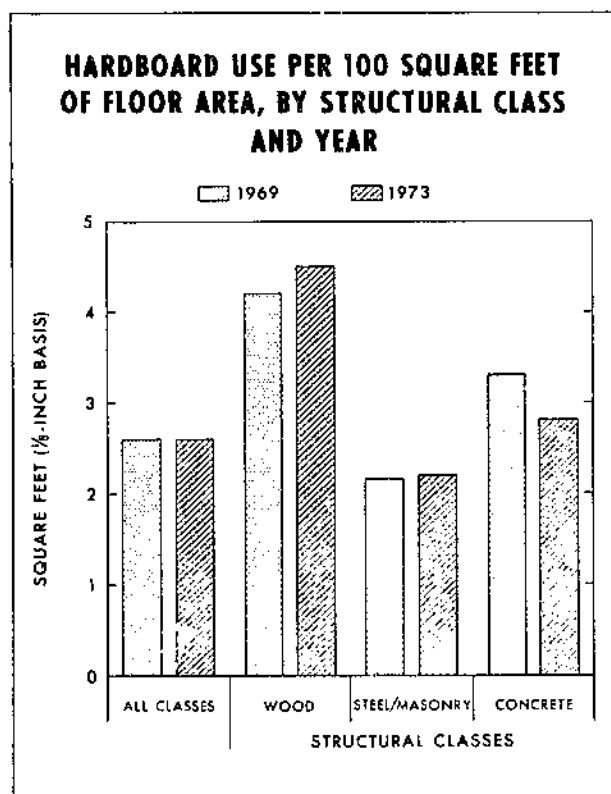


Figure 21.

M-144187

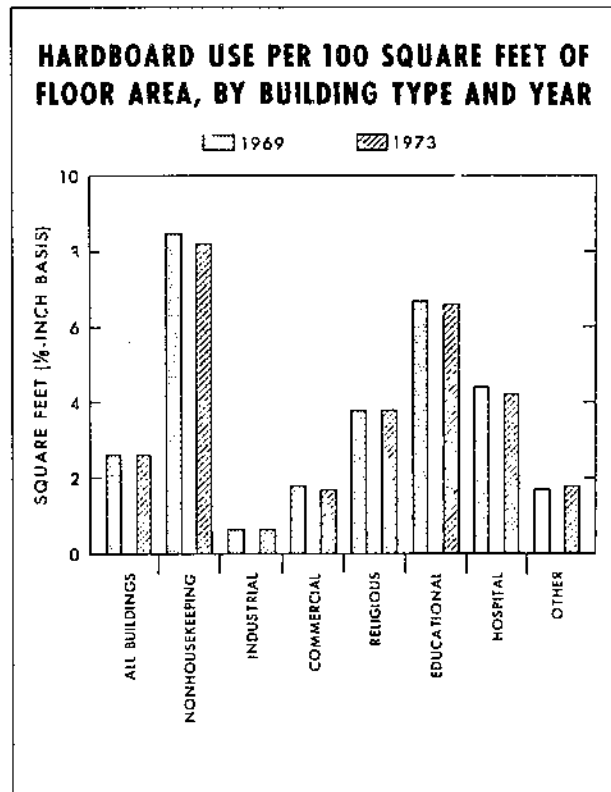


Figure 22.

M-144137

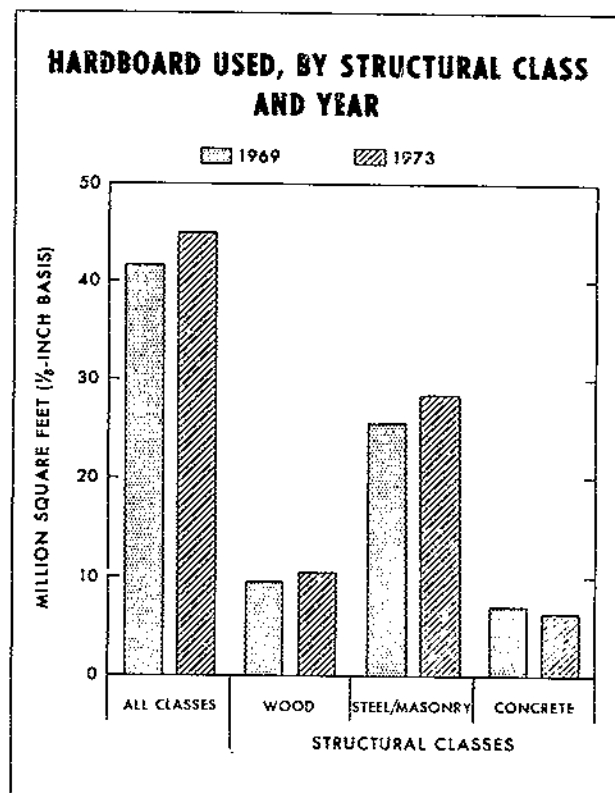


Figure 23.

M-144138

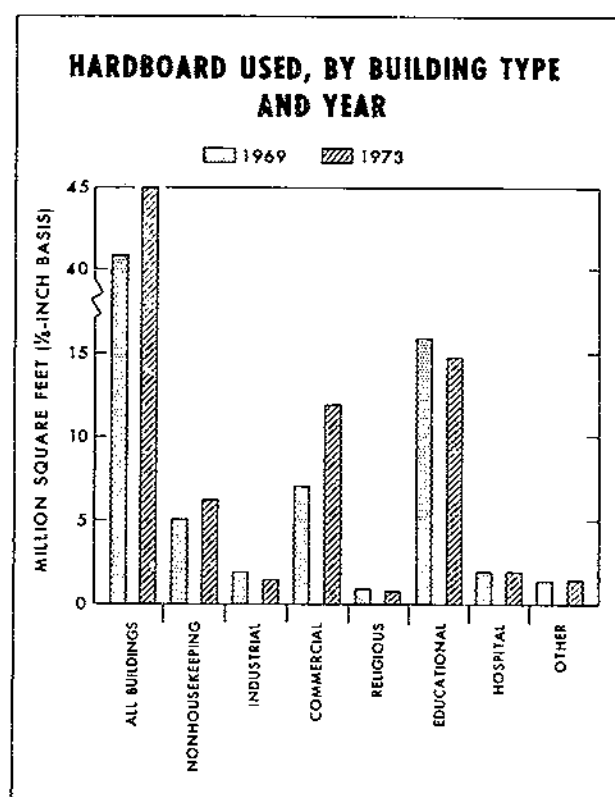


Figure 24.

M-144139

Particleboard

Use Per 100 Square Feet of Floor Area ($\frac{3}{4}$ -Inch Basis)

Particleboard use per 100 square feet of floor area in all buildings amounted to 0.9 square foot in 1969 and 2.0 square feet in 1973 (table 13). This increase was based on the increased production of particleboard and particularly on the increased consumption of particleboard in millwork. Approximately 90 percent of the particleboard used in nonresidential and nonhousekeeping building construction was in millwork.

Use of particleboard per square foot of floor area in 1973 increased over the use for 1969 in all structural classes and all building types (figs. 25 and 26). Use was greatest in nonhousekeeping build-

ings—6 square feet in 1969 and 16 square feet in 1973.

Total Particleboard Used ($\frac{3}{4}$ -Inch Basis)

Particleboard used in building construction amounted to 14 million square feet in 1969 and 35 million square feet in 1973 (table 14). Usage of particleboard increased in the construction of all building types at an average annual rate of approximately 25 percent. Between 1969 and 1973, particleboard used in constructing buildings in the steel/masonry class increased at an average annual rate of 30 percent; in the wood and concrete structural classes, it increased 17 percent (fig. 27). Approximately 60 percent of the particleboard used in construction was in nonhousekeeping and educational buildings (fig. 28).

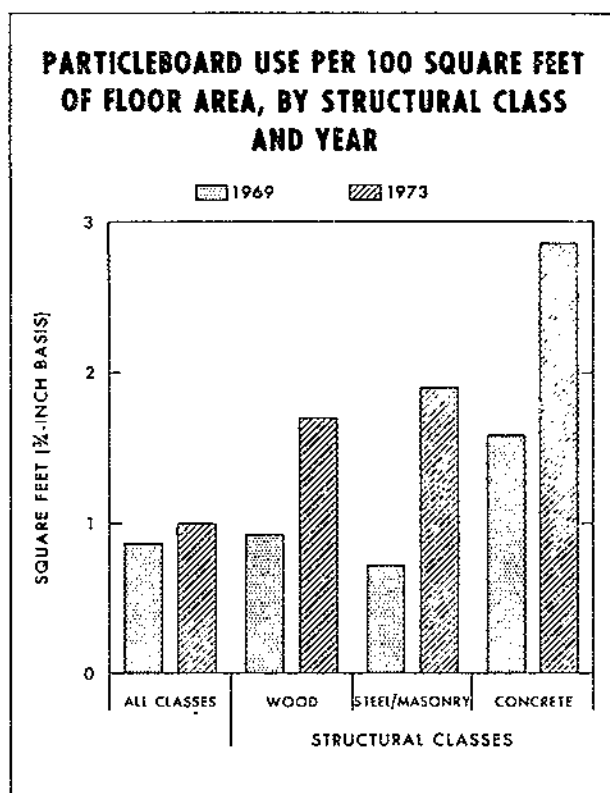


Figure 25.

M-144140

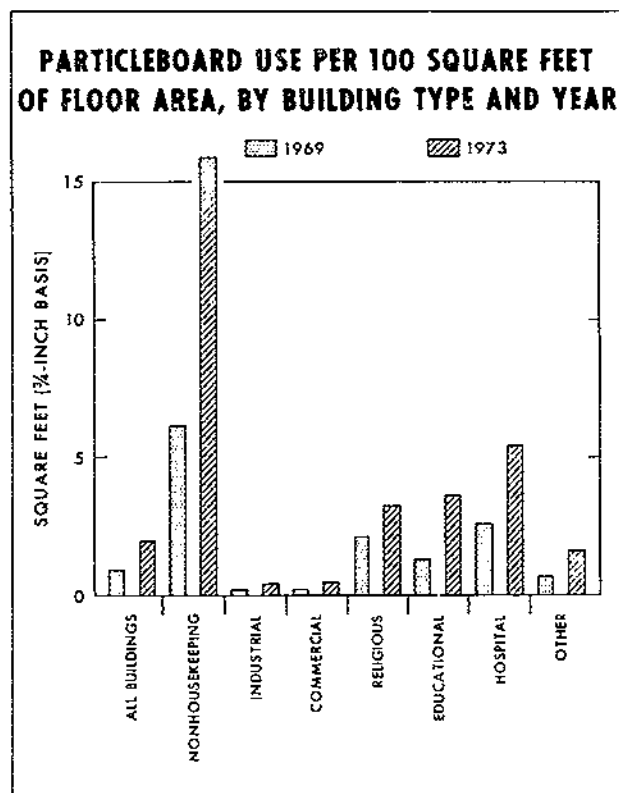


Figure 26.

M-144141

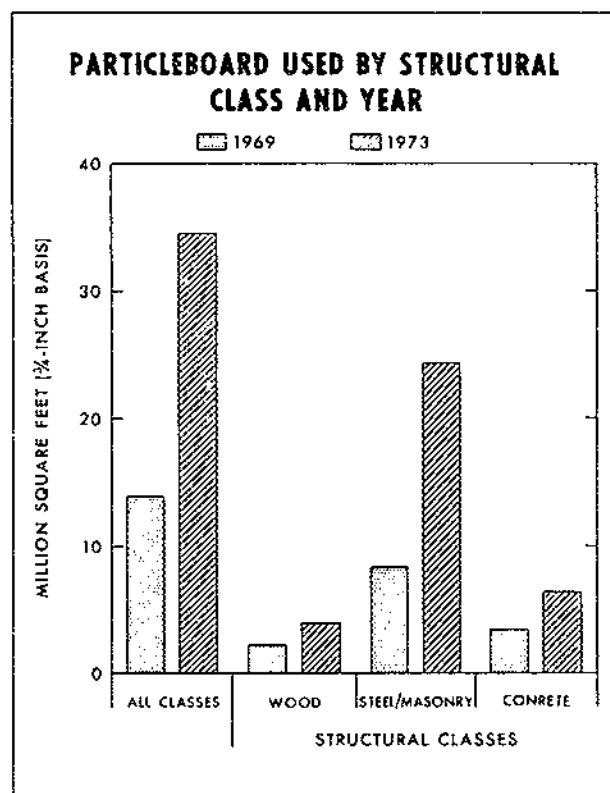


Figure 27.

M-144142

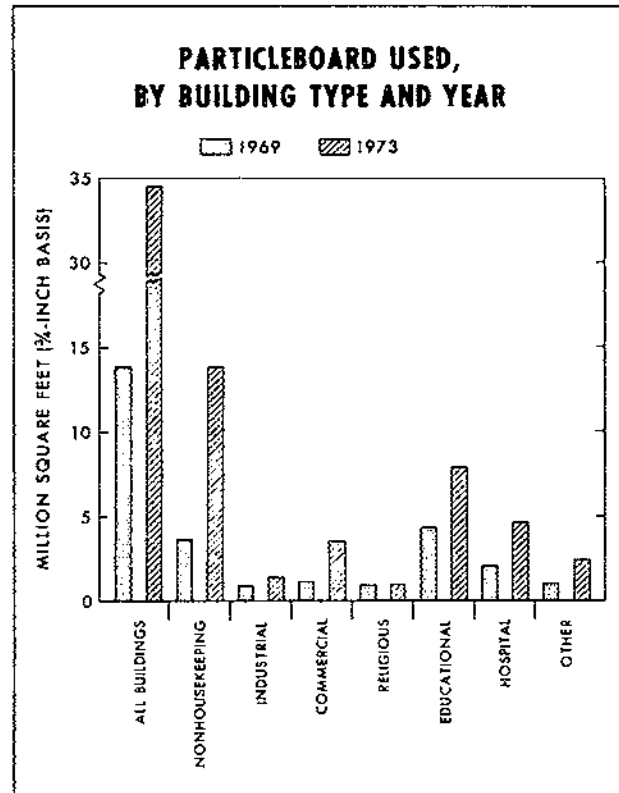


Figure 28.

M-144143

Insulation Board

Use Per 100 Square Feet of Floor Area ($\frac{1}{2}$ -Inch Basis)

Insulation board use per 100 square feet of floor area in all buildings was 5.0 square feet in 1969 and 4.5 square feet in 1973 (table 15). Slight differences in total use between 1969 and 1973 existed in the structural classes: Wood increased slightly; steel/masonry and concrete decreased slightly (fig. 29). During 1969 and 1973, insulation board use in nonhousekeeping buildings of approximately 11 square feet exceeded all other building types (fig. 30). Industrial, religious, and hospital buildings averaged about 7.6 square feet, and commercial, educational, and other buildings average about 2.6 square feet per 100 square feet of floor area.

Total Insulation Board Used ($\frac{1}{2}$ -Inch Basis)

Insulation board used in building construction amounted to 80 million square feet in 1969 and 77 million square feet in 1973 (table 16). Over 80 percent of the insulation board used was in the steel/masonry structural class (fig. 31). Insulation board used in constructing industrial and commercial buildings accounted for over 60 percent of the total used in 1969 and 1973. Usage in industrial buildings alone, however, accounted for 51 percent in 1969 and 38 percent in 1973 (fig. 32).

Usage of insulation board in 1973 was less than in 1969 in industrial, religious, and educational buildings, reflecting a decrease in the floor area constructed.

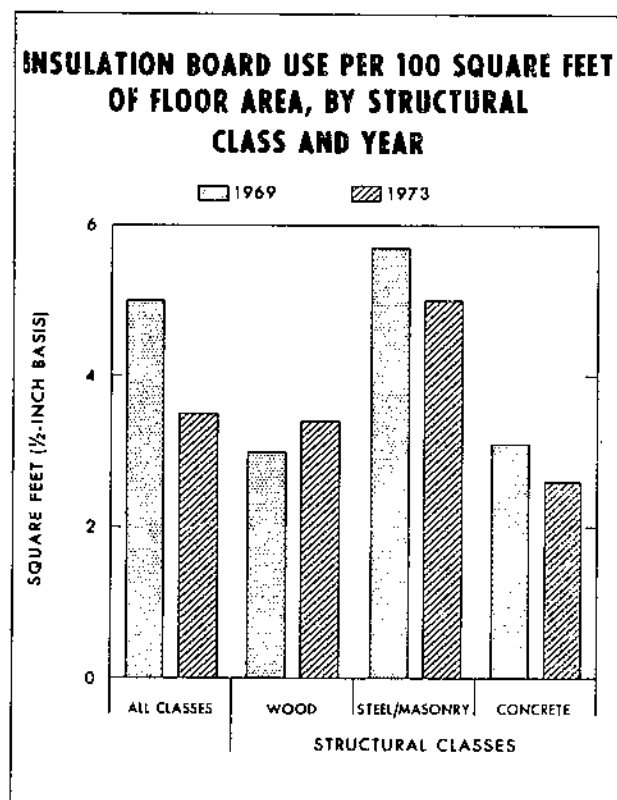


Figure 29.

M-144144

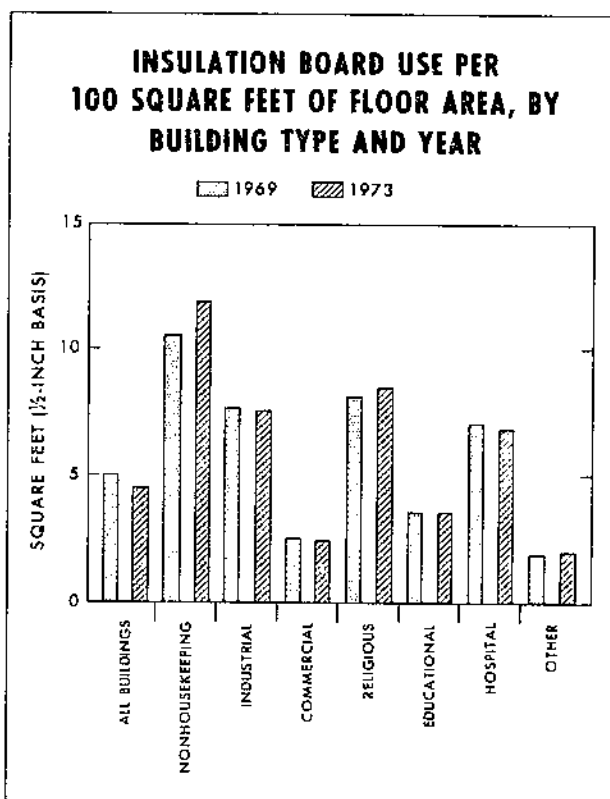


Figure 30.

M-144145

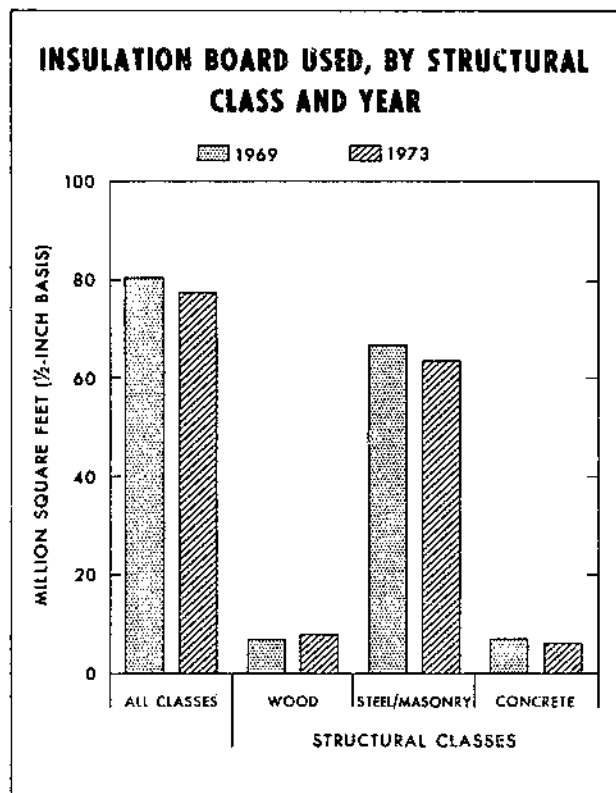


Figure 31.

M-144146

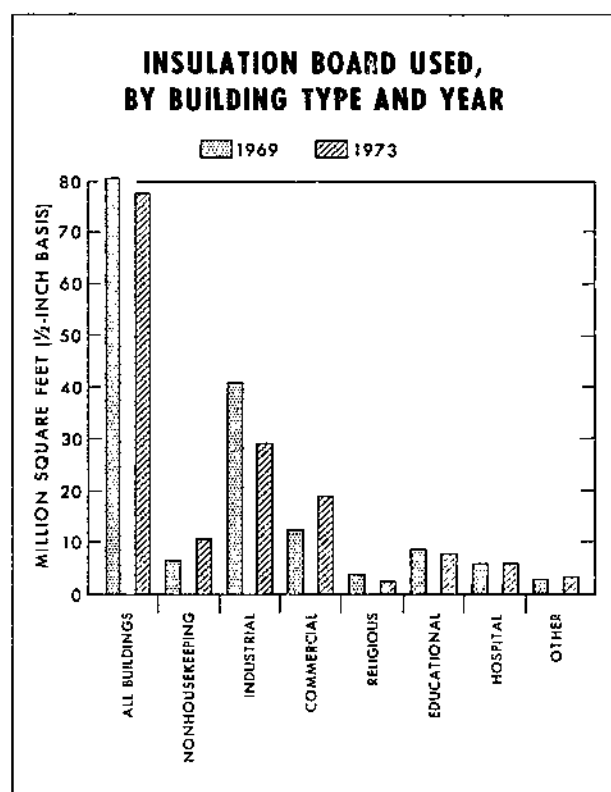


Figure 32.

M-144147

Structural Wood-Fiberboard

Use Per 100 Square Feet of Floor Area (1-Inch Basis)

Structural wood-fiberboard⁷ use per 100 square feet of floor area in all building types amounted to 11 square feet in 1969 and 9 square feet in 1973 (table 17). Total use in the steel/masonry structural class amounted to 14.0 square feet in 1969 and 10.5 square feet in 1973, a decrease of approximately 25 percent (fig. 33). Use in the concrete class decreased over 25 percent, while use in the wood structural class increased about 9 percent.

⁷ Structural wood-fiberboard is manufactured from excelsior-like strands of wood fibers and inorganic hydraulic cement (portland cement or gypsum) and bonded together under pressure and heat. Densities of the product may range from 22 to 36 pounds per cubic foot, thicknesses from 2 to 4 inches, and widths from 24 to 48 inches.

Use of structural wood-fiberboard per 100 square feet of floor area was highest in industrial and educational buildings, and averaged about 20 square feet during both 1969 and 1973 (fig. 34).

Total Structural Wood-Fiberboard Used (1-Inch Basis)

Structural wood-fiberboard used in building construction amounted to 185 million square feet in 1969 and 153 million square feet in 1973 (table 18). Almost 90 percent of the structural wood-fiberboard used during the 2 years was in the steel/masonry structural class (fig. 35). During 1969, 156 million square feet, or 85 percent of the total usage of this product in building construction, was in industrial and educational buildings; in 1973, 120 million square feet or 78 percent was used (fig. 36). Decreased usage in 1973 from 1969 was due primarily to the decreased activity in industrial building construction.

STRUCTURAL WOOD-FIBERBOARD USE PER 100 SQUARE FEET OF FLOOR AREA, BY STRUCTURAL CLASS AND YEAR

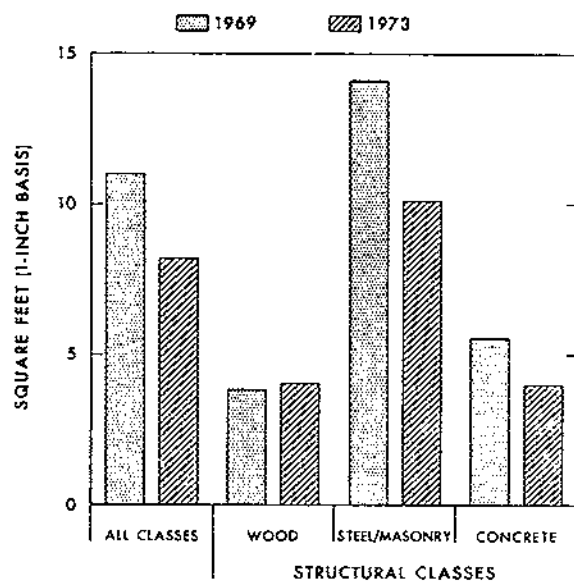


Figure 33.

M-144148

STRUCTURAL WOOD-FIBERBOARD USE PER 100 SQUARE FEET OF FLOOR AREA, BY BUILDING TYPE AND YEAR

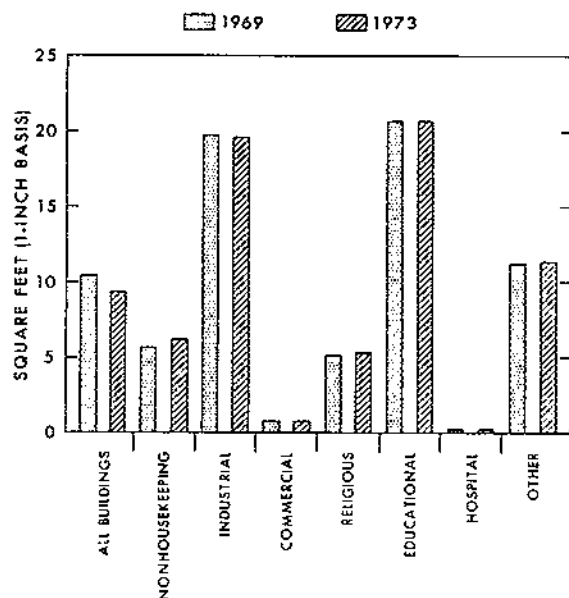


Figure 34.

M-144149

STRUCTURAL WOOD-FIBERBOARD USED, BY STRUCTURAL CLASS AND YEAR

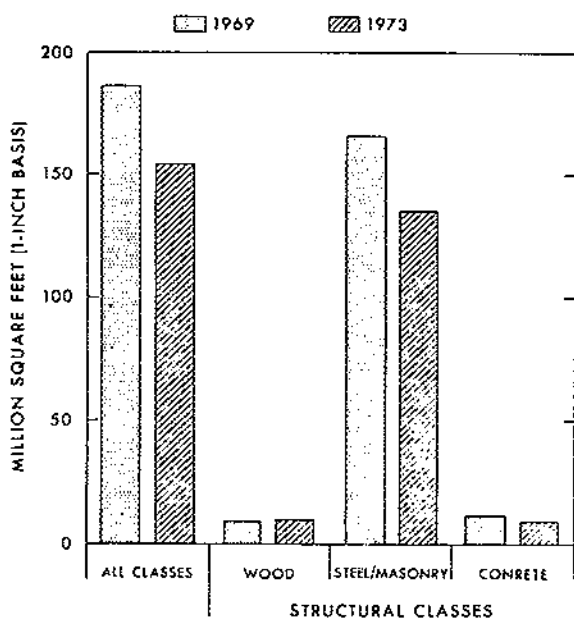


Figure 35.

M-144150

STRUCTURAL WOOD-FIBERBOARD USED, BY BUILDING TYPE AND YEAR

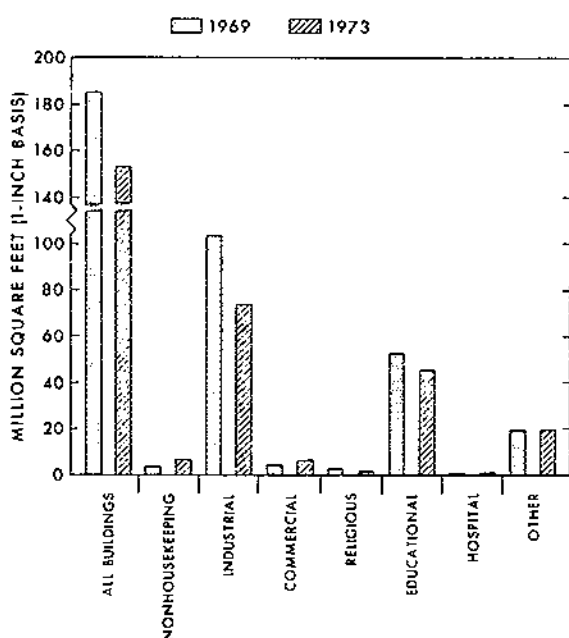


Figure 36.

M-144151

DEFINITIONS

Building Type ^s

Nonhousekeeping	Buildings providing residential facilities other than housing units, generally characterized as hotels (other than apartment hotels), motels, and dormitories.
Industrial	Buildings of manufacturing establishments, as defined in major groups 19-39 of the Standard Industrial Classification Manual, used to house production, assembly, and warehousing activities, as well as auxiliary facilities such as administration buildings.
Commercial	Buildings primarily for the rental of office space, to house banks and other financial institutions, or for use in wholesale, retail, and service trades such as stores, restaurants, and garages.
Educational	Buildings used directly in the administrative and instructional activities of establishments furnishing formal academic or technical courses, including colleges and universities, elementary and secondary schools, libraries, museums, and art galleries, as well as laboratories not part of manufacturing establishments.
Religious	Buildings used primarily for religious services and functions or to house and train religious personnel—churches, synagogues, convents, monasteries, theological seminaries, etc., as well as funeral parlors, mausoleums, and crematories.
Hospital	Buildings for establishments primarily engaged in providing hospital and institutional care, such as general, mental, and tuberculosis hospitals, clinics or infirmaries, sanitariums, nursing homes, homes for the aged, and orphanages.
Other	Buildings, except farm and public utilities, not elsewhere classified, such as auditoriums, theaters, indoor swimming pools, fire stations, and bus and air passenger terminals.

Structural Class

Wood	Buildings that used wood in one or more of the following structural areas: <ul style="list-style-type: none"> a. Wall framing consisting of wood studs or timbers. b. Floor framing consisting of wood joists or beams. c. Roof framing consisting of wood rafters, trusses, beams, or decking.
Steel/masonry	Buildings with structural framing consisting of steel columns, trusses and girders, or buildings with exterior walls consisting of concrete block, brick, or precast concrete, and with floor and roof supports consisting of materials other than wood.
Concrete	Buildings with structural framing consisting of reinforced concrete poured in place and with floor or roof supports consisting of materials other than wood.

Construction Components

Structural	Wood materials used in construction and providing structural support or unity to the building, including joists, beams, decking, rafters, studs, purlins, headers, sheathing, subflooring, and blocking.
Millwork	Wood products manufactured in millwork plants and planing mills, including doors, windows, shelving, cabinets, molding, and trim.
Facilitating	Wood materials used for the forming of concrete and other temporary applications in building construction, such as scaffolding and shoring.

^s U.S. Dept. Commerce, Bureau of Census, Construction Reports—Series C30-70, Value of new construction put in place; 1958-1970.

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TABLE 1.—Floor area of new construction in the United States, by building type, region, structural class, and year

(HUNDRED SQUARE FEET)

Building type and region	Structural classes								
	All classes			Wood		Steel/masonry		Concrete	
	1961	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping									
North.....	299, 520	287, 920	315, 300	39, 610	52, 600	123, 074	171, 300	125, 236	91, 400
South.....	182, 060	154, 580	391, 700	21, 487	98, 200	65, 387	185, 800	67, 706	107, 700
West.....	105, 720	147, 500	172, 600	77, 880	54, 500	45, 430	84, 300	24, 190	33, 800
Total.....	587, 300	590, 000	879, 600	138, 977	205, 300	233, 891	441, 400	217, 132	232, 900
Industrial									
North.....	1, 248, 800	3, 058, 100	1, 978, 500	20, 517	54, 300	2, 998, 990	1, 862, 900	38, 593	61, 300
South.....	710, 300	1, 335, 600	1, 094, 100	150, 000	62, 500	1, 068, 067	964, 900	117, 533	66, 700
West.....	486, 900	906, 300	774, 000	515, 685	367, 600	375, 615	348, 300	15, 000	58, 100
Total.....	2, 446, 000	5, 300, 000	3, 846, 600	686, 201	484, 400	4, 442, 672	3, 176, 100	171, 126	186, 100
Commercial									
North.....	1, 643, 600	2, 707, 650	3, 468, 600	188, 030	153, 800	2, 380, 127	2, 935, 900	139, 493	378, 900
South.....	1, 012, 300	1, 207, 800	2, 682, 700	65, 221	180, 600	984, 357	2, 130, 100	158, 222	372, 000
West.....	621, 400	1, 034, 550	1, 683, 500	428, 152	589, 200	431, 558	925, 900	174, 839	168, 400
Total.....	3, 277, 300	4, 950, 000	7, 834, 800	681, 404	923, 600	3, 796, 043	5, 991, 900	472, 553	919, 300
Religious									
North.....	300, 650	257, 840	131, 100	150, 626	73, 400	96, 965	54, 000	10, 249	3, 700
South.....	204, 440	117, 920	104, 000	74, 761	75, 200	37, 027	25, 300	6, 132	3, 500
West.....	96, 210	64, 240	58, 900	52, 484	39, 500	3, 726	18, 400	8, 030	1, 000
Total.....	601, 300	440, 000	294, 000	277, 871	188, 100	137, 718	97, 700	24, 411	8, 200
Educational									
North.....	1, 115, 100	1, 593, 150	1, 159, 000	19, 465	20, 900	1, 280, 478	937, 600	293, 207	200, 500
South.....	552, 800	496, 470	559, 100	14, 398	14, 600	367, 884	408, 700	114, 188	135, 800
West.....	432, 500	380, 380	414, 500	101, 181	103, 600	223, 283	248, 700	55, 916	62, 200
Total.....	2, 140, 400	2, 470, 000	2, 132, 600	135, 044	139, 100	1, 871, 645	1, 595, 000	463, 310	398, 500
Hospital									
North.....	208, 300	401, 720	495, 100	29, 234	51, 400	177, 442	311, 000	195, 044	132, 700
South.....	152, 760	231, 570	239, 800	19, 220	33, 900	72, 482	107, 100	139, 868	98, 800
West.....	101, 840	196, 710	134, 400	87, 143	40, 100	52, 915	53, 600	56, 652	40, 700
Total.....	462, 900	830, 000	869, 300	135, 597	125, 400	302, 839	471, 700	391, 564	272, 200

Other	524,700	804,080	738,000	70,422	107,800	590,341	561,600	143,317	68,600
North	333,900	375,440	409,300	49,558	67,700	232,773	258,500	93,109	83,100
South	333,900	340,480	388,900	83,418	75,300	133,808	257,600	123,254	56,000
West									
Total	1,192,500	1,520,000	1,536,200	203,398	250,800	956,922	1,077,700	359,680	207,700
All buildings									
North	5,380,670	9,110,460	8,285,600	517,904	514,200	7,647,417	6,834,300	945,139	937,100
South	3,148,560	3,919,380	5,480,700	394,645	532,700	2,827,977	4,080,400	696,758	867,600
West	2,178,470	3,070,160	3,626,800	1,345,944	1,269,800	1,266,335	1,936,800	457,881	420,200
Total	10,707,700	16,100,000	17,393,100	2,258,493	2,316,700	11,741,729	12,851,500	2,099,778	2,224,900

Source: 1961 data from: Construction Contracts, Regional Summaries by the F. W. Dodge Division, McGraw-Hill Information Systems Co.; and U.S. Dept. of Commerce, "Construction Statistics 1915-1964," 1969 and 1973 data from: special reports by the F. W. Dodge Division for the Forest Service, U.S. Dept. Agriculture and U.S. Dept. Commerce, "Statistical Abstract of the United States 1971-1974," Tables 1093 and 1179, "Construction Contracts" and U.S. Dept. Commerce, Bureau of Domestic Commerce, "Construction Review December 1971," Table 1-A, and "Construction Review February/March 1974," Table 1-A.

TABLE 2.—Construction value per square foot of floor area in the United States, by building type, region and year

Building type and region	Year		
	1961	1969	1973
Nonhousekeeping			
North	\$20.16	\$26.93	\$29.94
South	16.25	20.58	23.97
West	15.04	19.23	27.99
Average	\$18.03	\$23.34	\$26.90
Industrial			
North	\$13.02	\$13.80	\$15.82
South	14.19	12.96	20.40
West	12.69	14.90	19.20
Average	\$13.29	\$13.78	\$17.80
Commercial			
North	\$15.07	\$22.22	\$21.83
South	12.93	13.54	17.02
West	14.29	16.90	19.37
Average	\$14.26	\$18.99	\$19.71
Religious			
North	\$19.03	\$25.37	\$30.44
South	14.23	18.68	25.00
West	14.55	17.69	26.58
Average	\$16.68	\$22.45	\$27.69
Educational			
North	\$19.01	\$30.04	\$38.48
South	13.91	22.37	28.78
West	16.09	26.29	34.14
Average	\$17.10	\$27.92	\$35.09
Hospital			
North	\$27.89	\$39.74	\$50.68
South	22.39	33.12	43.11
West	21.31	30.99	45.46
Average	\$24.62	\$35.82	\$47.78
Other			
North	\$22.77	\$28.76	\$34.01
South	15.63	19.92	28.17
West	13.66	21.08	31.40
Average	\$18.22	\$24.86	\$31.79
All Buildings			
North	\$17.19	\$22.35	\$25.98
South	14.41	16.66	21.62
West	14.57	18.97	23.80
Average	\$16.05	\$20.32	\$24.15

Note: "Averages" presented in this and following tables have been weighted by categories and regions and, as a result, are not arithmetic averages.

TABLE 3.—Lumber use per 100 square feet of floor area in construction in the United States, by building type, region, structural class, and year

(BOARD FEET)

Building type and region	Structural class								
	Average, all classes			Wood		Steel/masonry		Concrete	
	1961	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping									
North.....	210.0	95.3	97.7	246.2	246.0	59.7	60.0	82.6	83.0
South.....	208.0	149.8	173.8	379.1	379.0	84.9	85.0	139.7	140.0
West.....	265.0	311.2	220.9	513.9	514.0	92.1	92.0	69.9	70.0
Average.....	219.3	163.6	155.8	416.8	380.8	73.0	76.6	99.0	107.5
Industrial									
North.....	63.0	22.3	24.0	105.1	105.0	21.4	21.0	45.5	45.0
South.....	109.0	53.3	44.0	199.1	199.0	33.8	34.0	44.2	44.0
West.....	130.0	261.3	230.3	389.6	390.0	94.1	94.0	36.6	37.0
Average.....	89.7	71.0	71.2	339.4	333.4	30.5	33.0	43.9	42.1
Commercial									
North.....	87.0	38.7	36.0	162.4	162.0	28.5	28.0	46.6	47.0
South.....	123.0	73.1	77.0	337.7	337.0	58.6	59.0	54.1	54.0
West.....	177.0	247.6	237.8	402.6	403.0	161.1	161.0	81.8	82.0
Average.....	115.2	90.8	93.4	330.1	350.0	51.4	59.6	62.1	56.2
Religious									
North.....	205.0	288.0	279.8	432.4	432.0	87.8	88.0	60.3	60.0
South.....	228.0	360.5	387.9	475.2	475.0	153.2	153.0	213.9	214.0
West.....	423.0	586.5	541.9	667.0	667.0	291.8	292.0	197.3	197.0
Average.....	247.7	351.0	370.5	488.2	498.5	110.9	143.2	143.9	142.4
Educational									
North.....	145.0	70.2	72.5	420.6	421.0	63.7	64.0	75.7	76.0
South.....	118.0	120.2	119.2	434.0	434.0	113.0	113.0	104.1	104.0
West.....	293.0	255.2	248.5	565.2	565.0	148.8	149.0	119.0	119.0
Average.....	167.9	108.8	119.0	530.4	529.6	83.5	89.8	87.9	92.2
Hospital									
North.....	140.0	89.5	96.7	386.3	386.0	59.2	59.0	72.7	73.0
South.....	228.0	120.8	129.4	400.0	400.0	57.1	57.0	115.4	115.0
• West.....	230.0	275.2	217.0	471.2	471.0	55.0	55.0	179.6	180.0
Average.....	188.8	142.3	124.3	442.8	417.0	58.0	58.1	103.4	118.7

Other									
North	148.0	96.9	118.9	459.7	460.0	59.3	59.0	73.4	73.0
South	163.0	105.6	108.1	198.2	198.0	83.9	84.0	110.4	110.0
West	197.0	186.7	177.2	467.4	467.0	115.2	115.0	74.3	74.0
Average	165.9	119.1	130.8	399.2	391.4	73.1	78.4	83.3	88.1
All buildings									
North	115.3	54.9	55.5	307.8	298.5	35.9	36.3	70.0	62.2
South	140.0	89.9	92.2	302.4	337.0	60.2	61.8	90.2	84.7
West	210.2	257.8	234.3	435.1	431.4	127.7	136.6	96.3	89.0
Average	141.9	102.1	104.3	382.7	380.2	51.7	59.5	82.4	76.0

TABLE 4.—Lumber used in the United States, by building type, year, and construction component

Building type and year	Floor area	Construction component							
		All components		Structural		Millwork		Facilitating	
		Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total
Nonhousekeeping	Hundred square feet	Board feet	Board feet	Board feet	Board feet	Board feet	Board feet	Board feet	Board feet
1961	587,300	219.3	128,783,000	123.9	72,777,000	14.2	8,356,000	81.2	47,650,000
1969	590,000	163.6	96,500,000	103.9	61,315,000	29.8	17,585,000	29.8	17,600,000
1973	879,600	155.8	137,028,000	99.7	87,698,000	28.0	24,665,000	28.0	24,665,000
Industrial									
1961	2,446,000	89.7	219,394,000	58.5	143,168,000	1.9	4,554,000	29.3	71,672,000
1969	5,300,000	71.0	376,109,000	59.3	314,255,000	2.9	15,166,000	8.8	46,688,000
1973	3,846,600	71.2	274,013,000	59.1	227,431,000	2.8	10,960,000	9.3	35,622,000
Commercial									
1961	3,277,300	115.2	377,494,000	57.6	188,747,000	5.8	18,875,000	51.8	169,872,000
1969	4,950,000	90.8	449,260,000	60.9	301,394,000	7.0	34,511,000	22.9	113,355,000
1973	7,834,800	93.4	731,882,000	62.6	490,361,000	7.5	58,551,000	23.3	182,970,000

TABLE 4.—Lumber used in the United States, by building type, year, and construction component—Continued

Building type and year	Floor area	Construction component							
		All components		Structural		Millwork		Facilitating	
		Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total
Religious	<i>Hundred square feet</i>	<i>Board feet</i>	<i>Board feet</i>	<i>Board feet</i>	<i>Board feet</i>	<i>Board feet</i>	<i>Board feet</i>	<i>Board feet</i>	<i>Board feet</i>
1961.....	601, 300	247. 7	148, 942, 000	173. 0	103, 991, 000	15. 3	9, 205, 000	59. 4	35, 746, 000
1969.....	440, 000	351. 0	154, 445, 000	295. 1	129, 850, 000	30. 7	13, 504, 000	25. 2	11, 091, 000
1973.....	294, 000	370. 5	108, 939, 000	311. 3	91, 509, 000	33. 3	9, 804, 000	25. 9	7, 626, 000
Educational									
1961.....	2, 140, 400	167. 9	359, 443, 000	72. 2	154, 561, 000	13. 4	28, 755, 000	82. 3	176, 127, 000
1969.....	2, 470, 000	108. 8	268, 680, 000	67. 3	166, 336, 000	17. 7	43, 611, 000	23. 8	58, 733, 000
1973.....	2, 132, 600	119. 0	253, 677, 000	73. 8	157, 280, 000	19. 0	40, 588, 000	26. 2	55, 809, 000
Hospital									
1961.....	462, 900	188. 8	87, 414, 000	53. 6	24, 826, 000	17. 9	8, 304, 000	117. 3	54, 284, 000
1969.....	830, 000	142. 3	118, 084, 000	75. 1	62, 316, 000	25. 7	21, 296, 000	41. 5	34, 472, 000
1973.....	869, 300	124. 3	108, 065, 000	65. 9	57, 274, 000	22. 4	19, 452, 000	36. 0	31, 339, 000
Other									
1961.....	1, 192, 500	165. 9	197, 860, 000	94. 6	112, 780, 000	11. 6	13, 850, 000	59. 7	71, 230, 000
1969.....	1, 520, 000	119. 1	181, 095, 000	77. 2	117, 420, 000	11. 0	16, 677, 000	30. 9	46, 998, 000
1973.....	1, 536, 200	130. 8	200, 923, 000	84. 8	130, 198, 000	12. 0	18, 485, 000	34. 0	52, 240, 000
All buildings									
1961.....	10, 707, 700	141. 9	1, 519, 330, 000	74. 8	800, 850, 000	8. 6	91, 899, 000	58. 5	626, 581, 000
1969.....	16, 100, 000	102. 1	1, 644, 173, 000	71. 6	1, 152, 886, 000	10. 1	162, 350, 000	20. 4	328, 937, 000
1973.....	17, 393, 100	104. 3	1, 814, 527, 000	71. 4	1, 241, 751, 000	10. 5	182, 505, 000	22. 4	390, 271, 000

TABLE 5.—Lumber used in construction in the United States, by building type, region, structural class, and year

(THOUSAND BOARD FEET)

Building type and region	Structural class								
	All classes			Wood		Steel/masonry		Concrete	
	1961	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping									
North.....	62, 899	27, 446	30, 804	9, 750	12, 940	7, 374	10, 278	10, 349	7, 586
South.....	37, 868	23, 156	68, 089	8, 146	37, 218	5, 554	15, 793	9, 457	15, 078
West.....	28, 016	45, 898	38, 135	40, 024	28, 013	4, 184	7, 756	1, 691	2, 366
Total.....	128, 783	96, 500	137, 028	57, 920	78, 171	17, 084	33, 827	21, 496	25, 030
Industrial									
North.....	78, 674	68, 138	47, 580	2, 156	5, 701	64, 227	39, 121	1, 754	2, 758
South.....	77, 423	71, 178	48, 179	29, 866	12, 438	36, 111	32, 806	5, 201	2, 935
West.....	63, 297	236, 109	178, 254	200, 901	143, 364	35, 343	32, 740	549	2, 150
Total.....	219, 394	376, 109	274, 013	232, 924	161, 503	135, 680	104, 667	7, 504	7, 843
Commercial									
North.....	142, 993	104, 794	124, 929	30, 532	24, 916	67, 762	82, 205	6, 500	17, 808
South.....	124, 513	88, 256	206, 626	22, 028	60, 862	57, 664	125, 676	8, 564	20, 088
West.....	109, 988	256, 211	400, 327	172, 384	237, 448	69, 531	149, 070	14, 295	13, 809
Total.....	377, 494	449, 260	731, 882	224, 944	323, 226	194, 957	356, 951	29, 359	51, 705
Religious									
North.....	61, 633	74, 256	36, 683	65, 128	31, 709	8, 510	4, 752	618	222
South.....	46, 612	42, 511	40, 340	35, 525	35, 720	5, 674	3, 871	1, 312	749
West.....	40, 697	37, 678	31, 916	35, 006	26, 346	1, 087	5, 373	1, 584	197
Total.....	148, 942	154, 445	108, 939	135, 659	93, 775	15, 272	13, 996	3, 514	1, 168

TABLE 5.—Lumber used in construction in the United States, by building type, region, structural class, and year—Continued

(THOUSAND BOARD FEET)

Building type and region	Structural class								
	All classes			Wood		Steel/masonry		Concrete	
	1961	1969	1973	1969	1973	1969	1973	1969	1973
Educational									
North.....	167, 490	111, 905	84, 043	8, 186	8, 799	81, 527	60, 006	22, 192	15, 238
South.....	65, 230	59, 697	66, 642	6, 248	6, 336	41, 560	46, 183	11, 888	14, 123
West.....	126, 723	97, 078	102, 992	57, 193	58, 534	33, 232	37, 056	6, 653	7, 402
Total.....	359, 443	268, 679	253, 677	71, 627	73, 669	156, 320	143, 245	40, 733	36, 763
Hospital									
North.....	29, 162	34, 971	47, 877	11, 293	19, 841	10, 501	18, 349	14, 177	9, 687
South.....	34, 829	27, 969	31, 027	7, 688	13, 560	4, 141	6, 105	16, 140	11, 362
West.....	23, 423	54, 145	29, 161	41, 061	18, 887	2, 910	2, 948	10, 173	7, 326
Total.....	87, 414	118, 084	108, 065	60, 042	52, 288	17, 552	27, 402	40, 490	28, 375
Other									
North.....	77, 656	77, 892	87, 730	32, 375	49, 588	34, 998	33, 134	10, 520	5, 008
South.....	54, 426	39, 642	44, 260	9, 820	13, 405	19, 540	21, 714	10, 282	9, 141
West.....	65, 778	63, 561	68, 933	38, 993	35, 165	15, 408	29, 624	9, 160	4, 144
Total.....	197, 860	181, 096	200, 923	81, 187	98, 158	69, 946	84, 472	29, 962	18, 293
All buildings									
North.....	620, 507	500, 402	459, 646	159, 420	153, 494	274, 872	247, 845	66, 110	58, 307
South.....	440, 901	352, 409	505, 163	119, 321	179, 539	170, 244	252, 148	62, 844	73, 476
West.....	457, 922	791, 362	849, 718	585, 562	547, 757	161, 695	264, 567	44, 105	37, 394
Total.....	1, 519, 330	1, 644, 173	1, 814, 527	864, 303	880, 790	606, 811	764, 560	173, 059	169, 177

TABLE 6.—Glued-laminated lumber use per 100 square feet of floor area in construction in the United States, by building type, structural class, and year

(BOARD FEET)

Building type	Structural class							
	Average, all classes		Wood		Steel/masonry		Concrete	
	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping.....	3. 63	3. 59	14. 62		. 23		. 27	
Industrial.....	14. 58	14. 16	112. 07		. 07		0	
Commercial.....	8. 00	6. 87	57. 76		. 02		. 45	
Religious.....	49. 71	50. 37	78. 20		1. 03		0	
Educational.....	8. 17	9. 31	139. 11		. 31		. 04	
Hospital.....	1. 42	1. 25	8. 71		0		0	
Other.....	20. 15	24. 55	148. 38		. 47		0	
Average, all buildings.....	11. 93	10. 63	84. 20	78. 98	. 14	. 12	. 14	. 22

TABLE 7.—Glued-laminated lumber used in construction in the United States, by building type, structural class, and year

(THOUSAND BOARD FEET)

Building type	Structural class							
	All classes		Wood		Steel/masonry		Concrete	
	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping.....	2, 144	3, 166	2, 032	3, 001	52	102	60	63
Industrial.....	77, 211	54, 508	76, 900	54, 286	311	222	0	0
Commercial.....	39, 642	53, 881	39, 355	53, 347	72	120	215	414
Religious.....	21, 871	14, 810	21, 729	14, 709	142	101	0	0
Educational.....	19, 390	19, 860	18, 786	19, 350	587	494	17	16
Hospital.....	1, 181	1, 092	1, 181	1, 092	0	0	0	0
Other.....	30, 631	37, 719	30, 181	37, 213	450	506	0	0
Total.....	192, 070	185, 036	190, 164	182, 998	1, 614	1, 545	292	493

TABLE 8.—Plywood use per 100 square feet of floor area in construction in the United States, by building type, region, structural class, and year

(SQUARE FEET, $\frac{3}{8}$ -INCH BASIS)

Building type and region	Structural class								
	Average, all classes			Wood		Steel/masonry		Concrete	
	1961	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping									
North.....	105.0	140.6	121.6	217.8	204.0	85.2	78.0	170.6	156.0
South.....	59.0	100.4	92.2	163.8	153.0	48.3	44.0	130.6	120.0
West.....	220.0	175.4	128.7	258.1	241.0	89.7	82.0	70.3	64.0
Average.....	111.4	138.8	109.9	232.0	189.4	75.7	64.4	147.0	126.0
Industrial									
North.....	27.0	12.3	13.8	42.2	40.0	11.7	12.0	46.3	46.0
South.....	92.0	23.1	20.7	47.9	46.0	16.6	17.0	50.7	51.0
West.....	79.0	106.4	91.4	155.6	149.0	42.0	41.0	28.7	29.0
Average.....	56.2	31.1	31.4	128.7	124.5	15.4	16.7	47.8	42.5
Commercial									
North.....	59.0	18.6	19.4	59.0	58.0	13.8	14.0	46.2	46.0
South.....	100.0	32.0	33.6	119.0	117.0	23.7	24.0	48.0	48.0
West.....	224.0	172.8	151.5	223.6	221.0	145.3	143.0	116.4	115.0
Average.....	102.9	54.1	52.6	168.2	144.3	31.3	37.5	72.8	59.4
Religious									
North.....	55.0	104.9	97.6	139.0	133.0	58.0	54.0	47.3	32.0
South.....	70.0	148.9	148.2	183.9	176.0	76.5	71.0	160.0	110.0
West.....	87.0	192.0	171.0	198.3	189.0	145.9	135.0	172.4	119.0
Average.....	65.2	129.4	130.2	162.3	162.0	65.3	73.6	116.7	75.9
Educational									
North.....	76.0	50.4	43.8	74.8	73.0	48.0	41.0	59.5	54.0
South.....	70.0	99.3	87.6	247.0	241.0	83.6	72.0	131.1	118.0
West.....	140.0	177.4	159.7	313.2	306.0	125.1	107.0	140.8	127.0
Average.....	87.4	79.8	77.8	271.8	264.2	64.2	59.2	87.0	87.2
Hospital									
North.....	98.0	97.5	80.8	197.2	183.0	54.5	51.0	121.7	111.0
South.....	49.0	147.4	130.4	177.7	165.0	98.8	91.0	168.4	153.0
West.....	100.0	175.5	139.9	267.4	247.0	65.4	60.0	137.2	125.0
Average.....	82.3	129.9	103.6	239.5	205.2	67.0	62.4	140.6	128.3

Other									
North.....	77.0	52.7	49.2	88.4	86.0	40.3	38.0	86.0	83.0
South.....	69.0	70.3	66.3	69.6	69.0	60.1	57.0	96.0	93.0
West.....	109.0	85.4	76.5	160.6	158.0	58.9	56.0	63.3	61.0
Average.....	83.7	64.4	60.6	113.5	103.0	47.7	46.9	80.8	81.1
All buildings									
North.....	60.8	34.8	33.0	106.1	100.7	23.4	22.7	88.4	70.3
South.....	82.8	54.2	49.6	108.0	125.5	35.0	32.2	101.7	84.6
West.....	145.2	144.8	130.3	204.2	182.8	96.6	103.7	103.3	94.6
Average.....	84.5	60.5	58.5	164.9	151.4	34.1	38.0	96.1	80.5

TABLE 9.—Plywood used in the United States, by building type, year, and construction component

($\frac{3}{8}$ -INCH BASIS)

Building type and year	Floor area	Construction component							
		All components		Structural		Millwork		Facilitating	
		Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total
Nonhousekeeping	<i>Hundred square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>
1961.....	587,300	111.4	65,450,000	40.3	23,645,000	11.0	6,462,000	60.2	35,343,000
1969.....	590,000	138.8	81,875,000	52.2	30,800,000	46.9	27,654,000	39.7	23,421,000
1973.....	879,600	109.9	96,682,000	40.6	35,772,000	37.4	32,872,000	31.9	28,038,000
Industrial									
1961.....	2,446,000	56.2	137,530,000	26.8	65,444,000	2.2	5,427,000	27.2	66,659,000
1969.....	5,300,000	31.1	164,989,000	19.9	105,547,000	1.7	9,136,000	9.5	50,306,000
1973.....	3,846,600	31.4	120,764,000	19.8	76,081,000	1.9	7,246,000	9.7	37,437,000
Commercial									
1961.....	3,277,300	102.9	337,396,000	43.6	142,973,000	5.8	18,977,000	53.5	175,446,000
1969.....	4,950,000	54.1	267,837,000	24.2	119,565,000	3.9	19,403,000	26.0	128,869,000
1973.....	7,834,800	52.7	412,542,000	23.7	185,644,000	3.7	28,878,000	25.3	198,020,000

TABLE 9.—Plywood used in the United States, by building type, year, and construction component—Continued

($\frac{3}{8}$ -INCH BASIS)

Building type and year	Floor area	Construction component							
		All components		Structural		Millwork		Facilitating	
		Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total	Use per hundred sq. ft. of floor area	Total
Religious	<i>Hundred square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>
1961.....	601, 300	65. 2	39, 217, 000	13. 8	8, 293, 000	11. 0	6, 610, 000	40. 4	24, 314, 000
1969.....	440, 000	129. 4	56, 935, 000	80. 7	35, 495, 000	19. 2	8, 454, 000	29. 5	12, 986, 000
1973.....	294, 000	130. 2	38, 281, 000	80. 7	23, 734, 000	19. 5	5, 742, 000	30. 0	8, 805, 000
Educational									
1961.....	2, 140, 400	87. 4	187, 034, 000	19. 9	42, 661, 000	10. 7	22, 801, 000	56. 8	121, 572, 000
1969.....	2, 470, 000	79. 8	197, 108, 000	23. 6	58, 244, 000	29. 0	71, 770, 000	27. 2	67, 094, 000
1973.....	2, 132, 600	77. 8	165, 975, 000	23. 3	49, 793, 000	28. 0	59, 751, 000	26. 5	56, 431, 000
Hospital									
1961.....	462, 900	82. 3	38, 082, 000	7. 2	3, 316, 000	7. 4	3, 427, 000	67. 7	31, 339, 000
1969.....	830, 000	129. 9	107, 835, 000	30. 6	25, 419, 000	33. 7	27, 956, 000	65. 6	54, 460, 000
1973.....	869, 300	103. 6	90, 081, 000	23. 8	20, 719, 000	26. 9	23, 421, 000	52. 9	45, 941, 000
Other									
1961.....	1, 192, 500	83. 7	99, 836, 000	19. 3	22, 963, 000	10. 0	11, 980, 000	54. 4	64, 893, 000
1969.....	1, 520, 000	64. 4	97, 818, 000	19. 5	29, 676, 000	8. 5	12, 863, 000	36. 4	55, 279, 000
1973.....	1, 536, 000	60. 7	93, 179, 000	18. 2	27, 954, 000	7. 9	12, 113, 000	34. 6	53, 112, 000
All buildings									
1961.....	10, 707, 700	84. 5	904, 545, 000	28. 9	309, 295, 000	7. 1	75, 684, 000	48. 5	519, 566, 000
1969.....	16, 100, 000	60. 5	974, 397, 000	25. 1	404, 746, 000	11. 0	177, 236, 000	24. 4	392, 415, 000
1973.....	17, 393, 100	58. 5	1, 017, 504, 000	24. 1	419, 697, 000	9. 8	170, 023, 000	24. 6	427, 784, 000

TABLE 10.—Plywood used in construction in the United States, by building type, region, structural class, and year

(THOUSAND SQUARE FEET, $\frac{3}{8}$ -INCH BASIS)

Building type and region	Structural class								
	All classes			Wood		Steel/masonry		Concrete	
	1961	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping									
North.....	31, 450	40, 472	38, 349	8, 625	10, 730	10, 480	13, 361	21, 367	14, 258
South.....	10, 742	15, 525	36, 123	3, 521	15, 024	3, 159	8, 175	8, 845	12, 924
West.....	23, 258	25, 877	22, 210	20, 099	13, 134	4, 077	6, 913	1, 701	2, 163
Total.....	65, 450	81, 875	96, 682	32, 246	38, 888	17, 716	28, 449	31, 913	29, 345
Industrial									
North.....	33, 718	37, 620	27, 347	865	2, 172	34, 967	22, 355	1, 788	2, 820
South.....	65, 347	30, 904	22, 680	7, 189	2, 875	17, 758	16, 403	5, 957	3, 402
West.....	38, 465	96, 464	70, 737	80, 253	54, 772	15, 781	14, 280	431	1, 685
Total.....	137, 530	164, 989	120, 764	88, 308	59, 819	68, 505	53, 038	8, 176	7, 907
Commercial									
North.....	96, 972	50, 356	67, 451	11, 099	8, 920	32, 813	41, 102	6, 443	17, 429
South.....	101, 230	38, 670	90, 108	7, 764	21, 130	23, 310	51, 122	7, 597	17, 856
West.....	139, 194	178, 811	254, 983	95, 748	103, 213	62, 712	132, 404	20, 352	19, 366
Total.....	337, 396	267, 837	412, 542	114, 611	133, 263	118, 834	224, 628	34, 392	54, 651
Religious									
North.....	16, 536	27, 039	12, 796	20, 931	9, 762	5, 624	2, 916	484	118
South.....	14, 311	17, 562	15, 416	13, 749	13, 235	2, 832	1, 796	981	385
West.....	8, 370	12, 334	10, 069	10, 406	7, 466	544	2, 484	1, 384	119
Total.....	39, 217	56, 935	38, 281	45, 086	30, 463	8, 999	7, 196	2, 850	622
Educational									
North.....	87, 788	80, 332	50, 795	1, 457	1, 526	61, 422	38, 442	17, 453	10, 827
South.....	38, 696	49, 288	48, 969	3, 557	3, 519	30, 757	29, 426	14, 975	16, 024
West.....	60, 550	67, 487	66, 211	31, 687	31, 701	27, 925	26, 611	7, 875	7, 899
Total.....	187, 034	197, 108	165, 975	36, 700	36, 746	120, 104	94, 479	40, 303	34, 750
Hospital									
North.....	20, 413	39, 175	39, 997	5, 764	9, 406	9, 674	15, 861	23, 738	14, 730
South.....	7, 485	34, 129	31, 281	3, 415	6, 419	7, 160	9, 746	23, 554	15, 116
West.....	10, 184	34, 530	18, 803	23, 299	9, 905	3, 458	3, 810	7, 773	5, 088
Total.....	38, 082	107, 835	90, 081	32, 478	25, 730	20, 292	29, 417	55, 065	34, 934

TABLE 10.—Plywood used in construction in the United States, by building type, region, structural class, and year—Continued

(THOUSAND SQUARE FEET, $\frac{3}{8}$ -INCH BASIS)

Building type and region	Structural class								
	All classes			Wood		Steel/masonry		Concrete	
	1961	1969	1973	1969	1973	1969	1973	1969	1973
Other									
North.....	40,402	42,355	36,306	6,228	9,271	23,804	21,341	12,322	5,694
South.....	23,039	26,385	27,134	3,448	4,671	13,999	14,735	8,939	7,728
West.....	36,395	29,078	29,739	13,399	11,897	7,881	14,426	7,798	3,416
Total.....	99,836	97,818	93,179	23,076	25,839	45,684	50,502	29,058	16,838
All buildings									
North.....	327,279	317,348	273,041	54,969	51,787	178,784	155,378	83,595	65,876
South.....	260,850	212,466	271,711	42,643	66,873	98,975	131,403	70,848	73,435
West.....	316,416	444,583	472,752	274,891	232,088	122,378	200,928	47,314	39,736
Total.....	904,545	974,397	1,017,504	372,503	350,748	400,137	487,709	201,757	179,047

TABLE 11.—Hardboard use per 100 square feet of floor area in construction in the United States, by building type, structural class, and year

(SQUARE FEET, 1/8-INCH BASIS)

Building type	Structural class							
	Average, all classes		Wood		Steel/masonry		Concrete	
	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping.....	8.53	8.22	16.20		4.86		7.57	
Industrial.....	.68	.67	2.00		.49		.24	
Commercial.....	1.79	1.73	3.28		1.71		.31	
Religious.....	3.82	3.80	4.30		2.84		3.93	
Educational.....	6.68	6.64	3.19		6.59		8.04	
Hospital.....	4.36	4.18	12.03		2.86		2.85	
Other.....	1.66	1.79	1.43		2.08		.69	
Average, all buildings.....	2.60	2.59	4.17	4.51	2.16	2.20	3.34	2.80

TABLE 12.—Hardboard used in construction in the United States, by building type, structural class, and year

(THOUSAND SQUARE FEET, 1/8-INCH BASIS)

Building type	Structural class							
	All classes		Wood		Steel/masonry		Concrete	
	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping.....	5,033	7,234	2,252	3,326	1,137	2,145	1,644	1,763
Industrial.....	3,604	2,569	1,371	969	2,192	1,556	41	44
Commercial.....	8,884	13,558	2,239	3,029	6,499	10,244	146	285
Religious.....	1,681	1,118	1,194	809	391	277	96	32
Educational.....	16,490	14,159	431	444	12,334	10,511	3,725	3,204
Hospital.....	3,616	3,633	1,632	1,508	867	1,349	1,117	776
Other.....	2,527	2,744	290	359	1,989	2,242	248	143
Total.....	41,835	45,015	9,409	10,444	25,409	28,324	7,017	6,247

TABLE 13.—Particleboard use per 100 square feet of floor area in construction, in the United States, by building type, structural class, and year
(Square feet, 3/4-INCH BASIS)

Building type	Structural class							
	Average, all classes		Wood		Steel/masonry		Concrete	
	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping.....	6.12	15.78	2.15	4.95	10.64	24.55	3.77	8.71
Industrial.....	.15	.33	.63	1.32	.08	.20	.04	.07
Commercial.....	.22	.45	.14	.33	.18	.40	.60	.86
Religious.....	2.01	3.24	2.43	3.43	1.23	2.84	1.64	3.76
Educational.....	1.76	3.67	.75	1.58	1.81	3.89	1.83	3.50
Hospital.....	2.53	5.39	2.45	5.67	2.19	4.62	2.83	6.60
Other.....	.67	1.57	.64	1.45	.70	1.65	.59	1.32
Average, all buildings.....	.86	1.99	.92	1.68	.72	1.89	1.58	2.85

TABLE 14.—Particleboard used in construction in the United States, by building type, structural class, and year
(Thousand square feet, 3/4-INCH BASIS)

Building type	Structural class							
	Average, all classes		Wood		Steel/masonry		Concrete	
	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping.....	3,608	13,881	299	1,016	2,490	10,836	819	2,029
Industrial.....	806	1,287	435	639	363	635	8	13
Commercial.....	1,062	3,493	98	305	681	2,397	283	791
Religious.....	883	953	674	645	169	277	40	31
Educational.....	4,343	7,820	101	220	3,392	6,205	850	1,395
Hospital.....	2,104	4,687	332	711	665	2,179	1,107	1,797
Other.....	1,011	2,416	130	364	668	1,778	213	274
Total.....	13,817	34,537	2,069	3,900	8,428	24,307	3,320	6,330

TABLE 15.—Insulation board use per 100 square feet of floor area in construction in the United States, by building type, structural class, and year

(SQUARE FEET, 1/2-INCH BASIS)

Building type	Structural class							
	Averages, all classes		Wood		Steel/masonry		Concrete	
	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping.....	10.64	11.75	1.64		18.41		8.02	
Industrial.....	7.68	7.56	0		9.16		0	
Commercial.....	2.48	2.41	4.45		2.31		1.00	
Religious.....	8.13	8.46	5.63		14.60		.07	
Educational.....	3.58	3.56	2.50		4.31		.94	
Hospital.....	6.97	6.75	2.13		6.81		8.77	
Other.....	1.87	2.01	6.71		1.05		1.32	
Average, all buildings.....	4.99	4.45	3.02	3.37	5.70	4.96	3.12	2.62

TABLE 16.—Insulation board used in construction in the United States, by building type, structural class, and year

(THOUSAND SQUARE FEET, 1/2-INCH BASIS)

Building type	Structural class							
	Average, all classes		Wood		Steel/masonry		Concrete	
	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping.....	6,276	10,331	229	337	4,306	8,126	1,741	1,868
Industrial.....	40,695	29,093	0	0	40,695	29,093	0	0
Commercial.....	12,285	18,870	3,030	4,110	8,784	13,841	471	919
Religious.....	3,578	2,486	1,565	1,059	2,011	1,426	2	1
Educational.....	8,844	7,597	337	348	8,071	6,874	436	375
Hospital.....	5,784	5,866	288	267	2,061	3,212	3,435	2,387
Other.....	2,844	3,089	1,366	1,683	1,003	1,132	475	274
Total.....	80,306	77,332	6,815	7,804	66,931	63,704	6,560	5,824

TABLE 17.—Structural wood-fiberboard used per 100 square feet in floor area in construction in the United States, by building type, structural class, and year

(SQUARE FEET, 1-INCH BASIS)

Building type	Structural class							
	Average, all classes		Wood		Steel/masonry		Concrete	
	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping.....	6.33	7.29	1.36		12.23		3.15	
Industrial.....	19.42	19.12	0		23.16		0	
Commercial.....	.85	.85	0		1.05		.43	
Religious.....	5.32	5.55	1.96		12.94		0	
Educational.....	21.30	21.34	26.04		23.11		12.62	
Hospital.....	.06	.07	.07		.11		0	
Other.....	12.67	12.70	21.21		10.59		13.36	
Average, all buildings.....	11.05	8.82	3.80	4.14	14.05	10.49	5.49	4.02

TABLE 18.—Structural wood-fiberboard used in construction in the United States, by building type, structural class, and year

(THOUSAND SQUARE FEET, 1-INCH BASIS)

Building type	Structural class							
	Average, all classes		Wood		Steel/masonry		Concrete	
	1969	1973	1969	1973	1969	1973	1969	1973
Nonhousekeeping.....	3,732	6,411	188	279	2,860	5,398	684	734
Industrial.....	102,912	73,558	0	0	102,912	73,558	0	0
Commercial.....	4,184	6,686	0	0	3,987	6,291	197	395
Religious.....	2,339	1,633	545	369	1,794	1,264	0	0
Educational.....	52,608	45,511	3,516	3,622	43,241	36,860	5,851	5,029
Hospital.....	48	61	9	9	39	52	0	0
Other.....	19,264	19,508	4,313	5,320	10,146	11,413	4,805	2,775
Total.....	185,087	153,368	8,571	9,599	164,979	134,836	11,537	8,933

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