

CS35-31  
Plywood

U. S. DEPARTMENT OF COMMERCE  
BUREAU OF STANDARDS

**PLYWOOD**  
(Hardwood and Eastern Red Cedar)

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COMMERCIAL STANDARD CS35-31



A RECORDED STANDARD OF THE INDUSTRY

Below are described some of the series of publications of the Department of Commerce which deal with various phases of waste elimination.

**Simplified Practice Recommendations.**

These present in detail the development of programs to eliminate unnecessary variety in sizes, dimensions, styles, and types of over 120 commodities. They also contain lists of associations and individuals who have indicated their intention to adhere to the recommendations. These simplified schedules, as formulated and approved by the industries, are indorsed by the Department of Commerce.

**American Marine Standards.**

These are promulgated by the American Marine Standards Committee, which is controlled by the marine industry and administered as a unit of the division of simplified practice. Their object is to promote economy in construction, equipment, maintenance, and operation of ships. In general, they provide for simplification and improvement of design, interchangeability of parts, and minimum requisites of quality for efficient and safe operation.

**Commercial Standards.**

These are developed by various industries under a procedure similar to that of simplified practice recommendations. They are, however, primarily concerned with considerations of grade, quality, and such other characteristics as are outside the scope of dimensional simplification.

Lists of the publications in each of the above series can be obtained by applying to the national Bureau of Standards, Washington, D. C.

**U. S. DEPARTMENT OF COMMERCE**

**R. P. LAMONT, Secretary**

**BUREAU OF STANDARDS**

**GEORGE K. BURGESS, Director**

**PLYWOOD**

**(Hardwood and Eastern Red Cedar)**

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**COMMERCIAL STANDARD CS35-31**

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## ACCEPTORS

### ASSOCIATIONS

American Institute of Architects,  
Florida central chapter, St. Petersburg, Fla.  
American Institute of Architects,  
Washington State chapter, Seattle, Wash.  
American Specification Institute, Chicago, Ill.  
National Retail Furniture Assn., Chicago, Ill.  
Plywood Manufacturers Association, Chicago, Ill.

### FIRMS

Acme Steel Co., Chicago, Ill.  
Active Furniture Co. (Inc.), Jamestown, N. Y.  
Adams & Kelly Co., Omaha, Nebr. (in principle).  
Adler Manufacturing Co., Louisville, Ky.  
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Fond du Lac Table Manufacturing Co., Fond du Lac, Wis.  
Foreign & Domestic Veneer Co., Louisville, Ky.  
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Frost's Veneer & Seating Co. (Ltd.), Sheboygan, Wis.

- Fry-Fulton Lumber Co., St. Louis, Mo.  
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 Gardner Upholstered Furniture Co. (Inc.), Gardner, Mass.  
 Globe Bosse World Furniture Co., Evansville, Ind.  
 Gluedtite Panel Co. of Cadillac, Cadillac, Mich.  
 Haberer Furniture Co., J. E., Lowville, N. Y.  
 Hagerstown Mantel & Furniture Co., Hagerstown, Md.  
 Hallack & Howard Lumber Co., The, Denver, Colo.  
 Hamilton Manufacturing Co., Two Rivers, Wis.  
 Hanson-Ward Veneer Co., Bay City, Mich.  
 Harbor Plywood Corporation, Chicago, Ill.  
 Hardwood Products Corporation, Neenah, Wis.  
 Harper Furniture Co., Lenoir, N. C.  
 Henrich Panel Co. (Inc.), Buffalo, N. Y.  
 Heywood-Wakefield Co., Boston, Mass.  
 High Point Bending & Chair Co., Siler City, N. C.  
 Hofstatter's Sons (Inc.), Long Island City, N. Y.  
 Holland Furniture Co., Holland, Mich.  
 Home Furniture Co. (Inc.), York, Pa.  
 Hood-Wright Co., The, Big Rapids, Mich.  
 Hoosier Panel Co., New Albany, Ind.  
 Hosbach & Sons, Henry J., Detroit, Mich.  
 Hudson Veneer Co., Lenoir, N. C.  
 Huntingburg Furniture Co., Huntingburg, Ind.  
 Ideal Desk Co., Auburn, Me.  
 Imperial Upholstering Co., Lowell, Mass.  
 Indiana Veneer & Panel Co., New Albany, Ind.  
 Iron City Sash & Door Co., Pittsburgh, Pa.  
 J. & S. Furniture Manufacturing Co., Chicago, Ill.  
 Jamestown-Royal Upholstery Corporation, Jamestown, N. Y. (in principle).  
 Joerns Bros. Furniture Co., Stevens Point, Wis.  
 Johnson Chair Co., Chicago, Ill.  
 Jonas Manufacturing Co., Lenoir, N. C.  
 Karpen & Bros., S., Chicago, Ill.  
 Kaul Lumber Co., Birmingham, Ala. (in principle).  
 Kelso Veneer Co., Kelso, Wash. (in principle).  
 Kittinger Co. (Inc.), Buffalo, N. Y.  
 Klopstock Bros., San Francisco, Calif.  
 Knauth Bros., New York, N. Y. (in principle).  
 Knipp & Sons, John C., Baltimore, Md.  
 Kompass & Stoll Co., Niles, Mich.  
 Kraan Furniture Co. (Inc.), Henry, Philadelphia, Pa.  
 Krieg-Mellen Furniture Co., Indianapolis, Ind.  
 Krueger Manufacturing Co., The, Atlanta, Ga.  
 Lake Washington Shipyards, Houghton, Wash.  
 Lamb, George L., Nappanee, Ind.  
 Lawrence Plywood Corporation, Fall River, Mass.  
 Loughman Cabinet Co., St. Louis, Mo.  
 Louisville Veneer Mills (Inc.), The, Louisville, Ky.  
 Madden Son & Co., Thos., Indianapolis, Ind.  
 Mahoney Chair Co., Gardner, Mass. (in principle).  
 Manchester Furniture Co., The, Manchester, Ohio.  
 Maris Panel Co., H. B., San Francisco, Calif.  
 Markland Co., M. B., Atlantic City, N. J.  
 McClelland Co., The, Davenport, Iowa.  
 McDonnell Furniture Co., Marion, N. C.  
 McLeod & Smith (Inc.), Minneapolis, Minn. (in principle).  
 McMillen Co., The R., Oshkosh, Wis.  
 Memphis Plywood Corporation, Memphis, Tenn.  
 Mengel Co., The, Louisville, Ky.  
 Michelsen Furniture Co., George J., Rochester, N. Y.  
 Miller & Yeager, Terre Haute, Ind.  
 Mohawk Plywood Co., Warren, Pa.  
 Moore Manufacturing Co., Springfield, Mo.  
 Morrison-Merrill & Co., Salt Lake City, Utah.  
 Mottville Chair Works (Inc.), Mottville, N. Y.  
 Mutschler Bros. Co., Nappanee, Ind.  
 Nartzik (Inc.), J. J., Chicago, Ill.  
 New Albany Veneering Co., New Albany, Ind.  
 New England Reed Co., Boston, Mass.  
 New York Wood Working Corporation, New York, N. Y.  
 Nicholson Furniture Co. (Inc.), K., Chase City, Va.  
 Nonnast Co., The, Chicago, Ill.  
 Nypenn Furniture Co., Warren, Pa.  
 Olive & Myers Manufacturing Co., Dallas, Tex.  
 Olsen Co., O. C. S., Chicago, Ill.  
 Ostlind Manufacturing Co., Marshfield, Ore.  
 Pauk & Sons Manufacturing Co., H., St. Louis, Mo.  
 Pearl City Plywood Co. (Inc.), Jamestown, N. Y.  
 Period Cabinet Manufacturing Co., New Albany, Ind.

- Perry Plywood Corporation, High Point, N. C.  
 Phenix Furniture Co., Warren, Pa.  
 Pioneer Furniture Co., Eau Claire, Wis.  
 Puget Sound Manufacturing Co., Tacoma, Wash.  
 Pulaski Veneer Corporation, Pulaski, Va.  
 Read Co. (Inc.), The, Richford, Vt.  
 Reed Manufacturing Co., The, Springfield, Ohio.  
 Requarth Co., The F. A., Dayton, Ohio.  
 Richard Manufacturing Co., Burlington, Vt.  
 Rock, William, Baltimore, Md.  
 Rockford Veneer & Panel Co., Rockford, Ill.  
 Roddis Lumber & Veneer Co., Kansas City, Mo.  
 Roddis Lumber & Veneer Co., Marshfield, Wis.  
 Rounds & Porter Co., Wichita, Kans.  
 Saginaw Furniture Shops, Saginaw, Mich.  
 St. Louis Basket & Box Co., St. Louis, Mo.  
 San Diego & Arizona Railway Co., San Diego, Calif.  
 Sandusky Sash Door & Lumber Co., The, Sandusky, Ohio.  
 Sanford Sash & Blind Co., Sanford, N. C.  
 Schmit Furniture Co., The Henry, Cincinnati, Ohio.  
 Schock Parlor Frame Co., Minneapolis, Minn.  
 Seaburg Manufacturing Co., Jamestown, N. Y.  
 Setter Bros. (Inc.), Cattaraugus, N. Y.  
 Shaw Furniture Co., Cambridge, Mass.  
 Shelbyville Desk Co., Shelbyville, Ind.  
 Sinclair-Allen Manufacturing Co., Mottville, N. Y.  
 Southern Box & Lumber Co., Wilmington, N. C.  
 Southern Hardwood Lumber Co., Plymouth, Ind.  
 Southwestern Veneer Co., Cotton Plant, Ark.  
 Spokane Woodworking Co., Spokane, Wash.  
 Standard Furniture Manufacturing Co., St. Louis, Mo.  
 Standard School Equipment Co., Siler City, N. C.  
 Steul & Sons (Inc.), Henry C., Buffalo, N. Y.  
 Strable Hardwood Co., Oakland, Calif.  
 Sweat-Comings Co., The, Richford, Vt.  
 Tarlo & Son, Robert, Philadelphia, Pa.  
 Tell City Furniture Co., Tell City, Ind.  
 Thomas & Son (Inc.), Jos., Baltimore, Md.  
 Underwood Veneer Co., Wausau, Wis.  
 Union Chest & Cabinet Corporation, Rochester, N. Y.  
 United Furniture Manufacturers (Inc.), Wilkes-Barre, Pa.  
 United Plywood Corporation, New Albany, Ind.  
 Breece Manufacturing Co., Portsmouth, Ohio.  
 Gause-Beard Plywood Co., Memphis, Tenn.  
 New Albany Veneering Co., New Albany, Ind.  
 United Veneer Co., Portsmouth, Ohio.  
 United States Plywood Co. (Inc.), New York, N. Y.  
 Valley Veneer Co., Bassett, Va.  
 Veneer Manufacturers Co., Cicero, Ill.  
 Vilas-Harsha Manufacturing Co., Chicago, Ill.  
 Warren Veneer & Panel Co., Warren, Pa.  
 Washburn Williams & Co., Scranton, Pa.  
 Wasmuth-Endicott Co., Peru, Ind.  
 Wearn Lumber Co., J. H., Charlotte, N. C.  
 Western Furniture Co., Batesville, Ind.  
 Westing, Evans & Egmore (Inc.), Philadelphia, Pa.  
 Whitmer-Jackson Co., The, Cleveland, Ohio.  
 Whitney Reed Corporation, Leominster, Mass.  
 Williams & Sons, Ichabod T., New York, N. Y.  
 Williamsburg Chair Factory, Williamsburg, Ohio.  
 Wilson Furniture Co., Louisville, Ky.  
 Wisconsin Veneer Co., Rhinelander, Wis.  
 Wohlsen Co., The, Lancaster, Pa.  
 Wolfe Bros. & Co., Piney Flats, Tenn.  
 Wood & Son, Edward J., Clarksburg, W. Va.  
 Worcester Wind Motor Co., Worcester, Mass.  
 Wrought Steel Furniture Corporation, Chicago, Ill.  
 Zimmerman & Sons, J. P., Cincinnati, Ohio.

## GOVERNMENT

- Department of Agriculture, Washington, D. C.  
 Treasury Department, Washington, D. C.  
 War Department, Washington, D. C.

# PLYWOOD

## COMMERCIAL STANDARD, CS35-31

On April 9, 1931, a general conference of representative manufacturers, distributors, and consumers of plywood adopted a commercial standard for this commodity. The industry has since accepted and approved for promulgation by the Department of Commerce, through the National Bureau of Standards, the commercial standard as shown herein.

The standard became effective for new production on September 1, 1931.

Promulgation recommended.

I. J. FAIRCHILD,  
*Chief, Division of Trade Standards.*

Promulgated.

GEORGE K. BURGESS,  
*Director, Bureau of Standards.*

APPROVED.

R. P. LAMONT,  
*Secretary of Commerce.*

## COMMERCIAL STANDARD CS35-31

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### PURPOSE

These commercial standard grading rules are established as a universal basis of common understanding in the plywood industry. By their general adoption and use, much of the confusion hitherto experienced between buyer and seller will be eliminated. Furniture designers, architects, and purchasing agents will be able to specify their needs from nationally recognized grades; sharp practices and grade substitutions by unscrupulous dealers will be minimized, and the general satisfaction and ease of procurement made possible by nationally recognized grades should have a very beneficial effect on the entire industry.

### SCOPE

These rules cover plywood such as used in the furniture industry, for interior paneling, the cabinet trade and allied industries, made from the commonly used hardwoods and eastern red cedar. They specify the quality requirements for plywood of various species.

### GENERAL REQUIREMENTS

*Workmanship.*—All plywood sold as of commercial standard quality shall be well manufactured and free from blisters, wrinkles, laps, etc., except as permitted in the specific rules for the various grades.

*Gluing.*—The gluing of plywood is an art requiring meticulous care and precision to insure a satisfactory product, and therefore all commercial standard plywood shall be glued according to most approved methods with high grade vegetable glue or its equivalent.

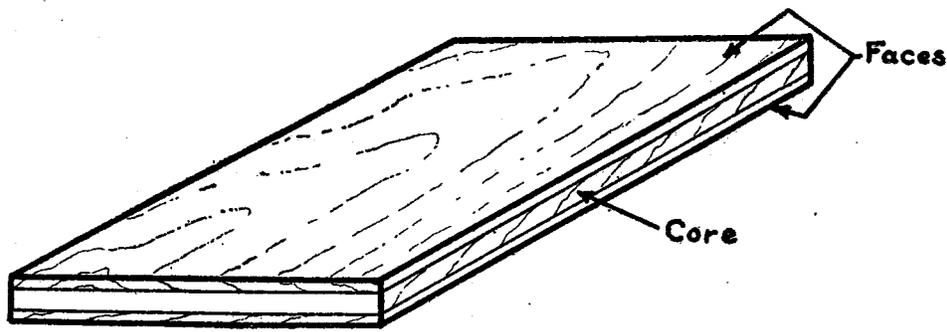
*Packing.*—All commercial standard plywood shall be securely packed to insure delivery in a clean and serviceable condition.

*Inspection.*—All plywood guaranteed to conform to the commercial standard grading rules, is sold subject to inspection in the white only and complaints regarding the quality of any shipment must be made within 15 days from receipt thereof.

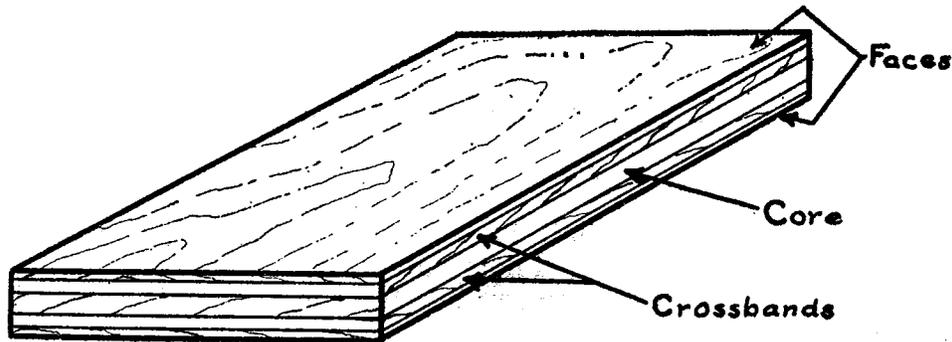
### DETAIL REQUIREMENTS

The following pages present the quality requirements for the various grades of faces and backs for commercial standard plywood.

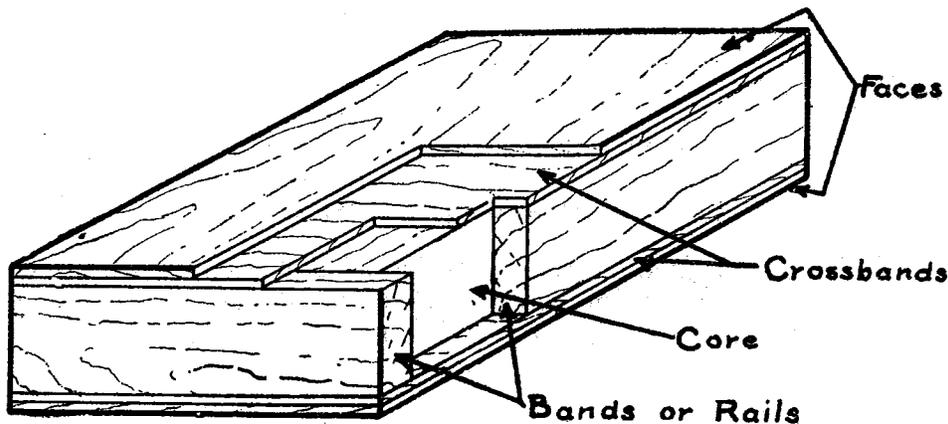
Cores and cross bandings for commercial standard plywood shall be made in an approved manner of any suitable wood. In cases where specially designated cores or cross bandings are required the grade rules on pages 10 and 11 shall be used. Plywood construction is illustrated in Figure 1.



THREE-PLY CONSTRUCTION WITH VENEER CORE.



FIVE-PLY CONSTRUCTION WITH VENEER CORE.



FIVE-PLY CONSTRUCTION WITH SAWN LUMBER  
CORE AND BANDING OR RAILING.

FIGURE 1.—*Plywood construction*

The grade of the surfaces is usually designated according to the use to which the plywood is put and a panel designated "AA" would be one in which both surfaces were of "A" grade. In the use of plywood panels for desk tops and similar purposes, the quality of

the unexposed side is of lesser importance and may be designated in one of the two general grades for backs described below.

The proper interpretation of the rules for any specific grade also necessitates full consideration of the next higher or lower grades of the same species since these tend to clarify the requirements with minimum repetition.

#### BACKS

*Sound backs.*—Those of any species of wood, unselected for uniformity of color, not matched for color or grain. Hair line open joints, sap, stains, burls, sound pin knots, and patches shall be admitted.

*No. 3 or reject backs.*—Those of any species of wood. Doze, stain, pithy knots, discolorations, burls, loose cutting, checks, splits, open knots, and open joints shall be admitted. Sanding or removal of tape is not required.

#### ASH, ELM, WHITE AND RED OAK

##### PLAIN, ROTARY CUT

*Grade A.*—Each face shall be matched for uniform grain and color. Discolorations, sap, knots, and wormholes shall not be admitted. Small burls, one or two small mineral streaks, and slight glue stains shall be admitted.

*Grade No. 1.*—Each face shall be matched for color but not for grain. Slight mineral streaks, slight glue stains, burls, sound pin knots, and inconspicuous patches shall be admitted. Sap and wormholes shall not be admitted.

*Grade No. 2.*—Faces not matched for color or grain. Hair line open joints, sap, discolorations, glue stains, burls, sound pin knots, pin wormholes, loose cutting, and patches shall be admitted. Splits, checks, and similar open defects if inconspicuously filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, above.

#### BIRCH, BASSWOOD, AND BEECH

*Grade A.*—Each face shall be unselected for uniformity of color but matched at the joint for grain and color and made of veneer that shall be tight and smoothly cut. Inconspicuous patches shall be admitted. Knots and stains shall not be admitted.

*Grade No. 1.*—Each face shall be unselected for uniformity of color but matched at the joint for color but not for grain. Slight stains and sound pin knots shall be admitted. Slightly ruptured grain not to exceed 5 per cent of panel surface shall be admitted. Inconspicuous patches shall be admitted.

*Grade No. 2.*—Faces unselected for uniformity of color and not matched for color or grain. Hair-line open joints, stains, burls, sound knots, and patches shall be admitted. Slightly ruptured grain not to exceed 15 per cent of panel surface shall be admitted.

*Grade No. 3.*—See reject backs, above.

## CEDAR, EASTERN RED

*Grade A.*—Each face shall be matched for grain character. Sap not to exceed 10 per cent of the total area shall be admitted. Sound knots and those with inconspicuously filled checks shall be admitted.

*Grade No. 1.*—Each face shall be matched for grain character. Sap not to exceed 50 per cent of total area shall be admitted. Sound knots and those with inconspicuously filled cross checks shall be admitted.

*Grade No. 2.*—Faces with mismatches and sap in unlimited quantities shall be admitted. Knots and checks shall be admitted if filled.

*Grade No. 3.*—See reject backs, page 4.

## GUM, FIGURED, RED

## QUARTER SLICED

*Grade A.*—Each face shall be of veneer carefully selected for well-balanced and decorative figure and matched in uniform widths with no pieces less than 6 inches except on the outer edges. Knots, sap, and discolorations shall not be admitted.

*Grade No. 1.*—Each face shall be of veneer matched for well-balanced and decorative figure but may be composed of random widths with no pieces less than 4 inches except on outer edges. Pin knots and discolorations not to exceed an average of two for each square foot shall be admitted. Sap admitted if uniformly distributed and not in excess of 15 per cent of the total panel area.

*Grade No. 2.*—No figure or matching requirements. Small sound knots, sap, and discolorations shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

## GUM, RED

## SAWN, SLICED, OR ROTARY CUT

*Grade A.*—Each face shall be of one or more pieces of veneer of random widths with the tight side exposed and matched to show uniform color throughout. Knots and discolorations shall not be admitted. Wormholes if inconspicuously filled or patched shall be admitted.

*Grade No. 1.*—Each face shall be of one or more pieces of veneer of random widths with the tight side exposed and matched to show uniform color throughout. Sound pin knots not to exceed an average of two for each square foot and slight discolorations shall be admitted.

*Grade No. 2.*—No color requirement. Sound knots and discolorations shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

GUM,<sup>1</sup> POPLAR, SYCAMORE

## ROTARY CUT

*Grade A.*—Each face shall be of one or more pieces of veneer of random widths with the tight side exposed and matched for color and grain at joints. Knots and discolorations shall not be admitted.

<sup>1</sup> This classification includes unselected sap gum (the sapwood of the red or sweet gum tree) together with the species known as black gum or tupelo.

*Grade No. 1.*—Each face shall be of one or more pieces of veneer of random widths with tight side exposed and not matched for color and grain at joints. Sound pin knots not to exceed an average of two for each square foot and slight discolorations shall be admitted.

*Grade No. 2.*—No character, color, grain, or texture requirements. Pin knots, splits, checks, and similar open defects if inconspicuously filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

#### MAHOGANY

*Grade A.*—Each face shall be matched for figure in either ribbon or broken stripe, as may be designated. Streaks, discolorations, pin knots, cross breaks, and sap shall not be admitted.

*Grade No. 1.*—Each face shall be matched for figure allowing 30 per cent plain heart grain. Pin knots not in excess of two for each square foot of panel shall be admitted. Sap, streaks, cross breaks, and discolorations shall not be admitted. Wormholes if inconspicuously filled or patched shall be admitted.

*Grade No. 2.*—No requirement for figure or matching. Streaks, discolorations, pin knots, wormholes, and cross breaks shall be admitted. Splits, checks, and similar open defects if filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

#### PLAIN

*Grades A, 1, and 2.*—In this classification the above grading rules shall apply but without restriction as to figure.

*Grade No. 3.*—See reject backs, page 4.

#### MAPLE

#### PLAIN

*Grade A.*—Each face shall be made of tight and smoothly cut veneer unselected for color but matched at the joints for grain and color. Mineral streaks not to exceed  $\frac{1}{4}$  inch in width by 1 inch in length will be admitted if not in excess of one to each 3 square feet of panel surface. Smooth bird's-eyes and swirls shall be admitted. Knots shall not be admitted.

*Grade No. 1.*—Each face shall be made of veneer unselected for color or grain but matched at the joints for color only. Stains and mineral discolorations, burls, and sound knots shall be admitted. Slightly ruptured grain not exceeding 10 per cent of panel surface shall be admitted. Inconspicuous patches shall be admitted.

*Grade No. 2.*—Each face shall be made of veneer not matched for color or grain. Hair-line open joints, stains, burls, small sound knots and patches shall be admitted. Slightly ruptured grain shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

## OAK, QUARTERED OR PLAIN, WHITE OR RED

## SAWN OR SLICED

*Grade A.*—Each face shall be of veneer matched for select figure (either large or small figure if so designated) with pieces not less than 4 inches in width, except on outer edges. Sap, knots, streaks, discolorations, broken flake, and wormholes shall not be admitted.

*Grade No. 1.*—Each face shall be of veneer matched at the joint for color and figure with pieces of random width but otherwise unselected for figure or color. Sound pin knots, streaks, and discolorations not exceeding an average of two for each square foot shall be admitted. Wormholes if inconspicuously filled or patched shall be admitted. Bright sap shall be admitted.

*Grade No. 2.*—Face veneers unselected for figure or color. Mismatches, sap, streaks, discolorations, small sound knots, broken flake, and hair-line open joints shall be admitted. Splits, checks, and similar open defects if filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

## WALNUT

## ROTARY CUT

Veneer showing full rotary cut and a wide variety of grain character.

*Grade A.*—Each face shall be of one or more pieces of veneer of random widths not less than 6 inches except on outer edges. It shall be of uniform grain and matched for grain character and color. Pin knots, streaks, discolorations, sap, and wormholes shall not be admitted.

*Grade No. 1.*—Each face shall be of one or more pieces of veneer of random width, not less than 4 inches except on outer edges. They shall be matched for grain character at joints. Sound pin knots shall be admitted if the average is not in excess of two for each square foot. Mineral discolorations shall be admitted. Bright sap not to exceed 10 per cent and wormholes if inconspicuously filled or patched shall be admitted.

*Grade No. 2.*—Faces of veneer unselected for grain character or color and composed of one or more pieces of random widths. Mismatches, discolorations, and small sound knots shall be admitted. Bright sap not to exceed 25 per cent and worm holes if inconspicuously filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

## ROTARY CUT—SAP GRADES

*Grade No. 1.*—Each face shall be of one or more pieces of veneer of random width not less than 4 inches, except on outer edges. They shall be matched for grain character at the joints. Sound pin knots shall be admitted if the average is not in excess of two for each square foot. Sap or black wood in unlimited quantities and mineral discolorations shall be admitted. Wormholes if inconspicuously filled or patched shall be admitted.

*Grade No. 2.*—Each face shall be of one or more pieces of veneer of random width unselected for grain character or color. Mismatches, discolorations, small sound knots, and sap or black wood in unlimited quantities shall be admitted. Wormholes if filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

#### HALF ROUND

A veneer produced on a rotary machine by off-center cutting. This results in a larger per cent of stripe character than by full rotary cutting.

*Grade A.*—Each face shall be of one or more pieces of veneer of random widths not less than 6 inches except on outer edges and matched for uniform color. Twenty-five per cent either heart or stripe grain character is required. Pin knots, streaks, discolorations, sap, and wormholes shall not be admitted.

*Grade No. 1.*—Each face shall be of one or more pieces of veneer of random widths, with no piece less than 4 inches wide except on the outer edges and matched for uniform color. Striped or heart grain character admitted in any proportions. Sound pin knots admitted if the average is not in excess of two per square foot. Mineral discolorations shall be admitted. Bright sap not to exceed 10 per cent, and wormholes if inconspicuously filled or patched shall be admitted.

*Grade No. 2.*—Each face shall be of one or more pieces of veneer of random widths unselected for grain character or color. Mismatches, discolorations, and sound pin knots shall be admitted. Bright sap not to exceed 10 per cent and wormholes if filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

#### HALF ROUND—SAP GRADES

*Grade No. 1.*—Each face shall be of one or more pieces of veneer of random widths, with no piece less than 4 inches except on outer edges. Striped or heart grain character admitted in any proportions. Sound pin knots are permitted if the average is not in excess of two per square foot. Mineral discolorations shall be admitted. Sap or black wood in unlimited quantities shall be admitted. Wormholes if inconspicuously filled or patched shall be admitted.

*Grade No. 2.*—Each face shall be of one or more pieces of veneer of random widths unselected for grain character or color. Mismatches, discolorations, and sound pin knots shall be admitted. Sap or black wood in unlimited quantities shall be admitted. Wormholes if filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

#### SLICED

Veneer sliced through the heart of the log showing either or both striped and heart grain character in varying proportions.

*Grade A.*—Each face shall be of one or more pieces of veneer of random widths not less than 5 inches except on outer edges and

matched for uniform color and grain character. Sixty per cent of heart grain character is permitted. Pin knots, streaks, discolorations, sap, and wormholes shall not be admitted.

*Grade No. 1.*—Each face shall be of one or more pieces of veneer of random widths with no piece less than 4 inches except on the outer edges. Eighty-five per cent heart grain character is permitted. Mineral discolorations shall be admitted. Sound pin knots are permitted if the average is not in excess of two for each square foot. Bright sap not to exceed 10 per cent and wormholes if inconspicuously filled or patched shall be admitted.

*Grade No. 2.*—Each face shall be of one or more pieces of veneer of random widths unselected for grain character or color and with striped or heart grain in any proportion. Mismatches, discolorations, and sound pin knots shall be admitted. Bright sap and wormholes if filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

#### SLICED—SAP GRADES

*Grade No. 1.*—Each face shall be of one or more pieces of veneer of random widths with no piece less than 4 inches except on outer edges. Eighty-five per cent of heart grain character is permitted. Mineral discolorations shall be admitted. Sound pin knots are permitted if the average is not in excess of two for each square foot. Sap or black wood in any quantities shall be admitted. Wormholes if inconspicuously filled or patched shall be admitted.

*Grade No. 2.*—Each face shall be of one or more pieces of veneer of random widths unselected for grain character or color and with either striped or heart grain character in any proportion. Mismatches, discolorations, sound pin knots, and sap or black wood in unlimited quantities shall be admitted. Wormholes if inconspicuously filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

#### STRIPED

Veneer showing a striped or ribbon grain character. This veneer can be prepared and glued either with tight side out or booked for character matching. Book matching will be furnished unless otherwise specified.

*Grade A.*—Each face shall be of one or more pieces of veneer of random widths not less than 3 inches except on the outer edges, and selected for uniform striped figure and color. Heart grain character not to exceed 10 per cent will be admitted. Pin knots, streaks, discolorations, sap, and wormholes shall not be admitted.

*Grade No. 1.*—Each face shall be of one or more pieces of veneer of random widths not less than 3 inches wide except on the outer edges. Sound pin knots are permitted if the average is not in excess of two for each square foot. Mineral discolorations or heart grain not in excess of 20 per cent surface measure shall be admitted. Bright sap not to exceed 10 per cent and wormholes if inconspicuously filled or patched shall be admitted.

*Grade No. 2.*—Each face shall be from veneer of random widths. Heart grain character not to exceed 30 per cent, sap not to exceed 10 per cent, mismatches, mineral discolorations, and pin knots shall be admitted. Wormholes if filled or patched shall be admitted.

*Grade No. 3.*—See reject backs, page 4.

## STUMP

Veneer cut from walnut stumps showing either or both "grain character" and "figure."

The minimum figure required to meet the several grades is indicated below. Sap shall be admitted unless otherwise specified.

*Minimum figure required*

Grade:	Per cent of panel length
A.....	65
No. 1.....	40
No. 2.....	20

## BUTTERFLY OR GRAIN MATCHED DESIGN—PLAIN OR GRAIN CHARACTER

Well-matched walnut showing designs formed by grain character only. Sap shall not be admitted.

## CORES AND CROSSBANDING

The following paragraphs on cores and crossbandings describe the grades that shall be used when specially designated cores or crossbanding are required.

## CORES OR CENTERS

## SAWN

*Grade A.*—A core of any designated wood with any specified type of tight glued joint and strips not over 4 inches wide. Discolorations shall be admitted but it shall be clear of defects.

*Grade No. 1.*—A core of any designated wood with tight glued joints and strips not over 5 inches wide. Discolorations shall be admitted.

*Grade No. 2.*—A core of any designated wood with any type of tight joints and strips not over 5 inches wide. Sound knots, discolorations, and butt joints shall be admitted. Open defects if securely patched shall be admitted.

*Grade No. 3.*—A core of any designated wood in either No. 1 or No. 2 grades with edges clear of defects to permit shaping (or molding) to a depth of  $1\frac{1}{2}$  inches on all edges.

## BANDED

- Any designated wood, B1E, banded one end.
- Any designated wood, B2E, banded two ends.
- Any designated wood, B1S, banded one side.
- Any designated wood, B2S, banded two sides.
- Any designated wood, B3, banded two ends and one side.

Any designated wood, B2S1E, banded two sides and one end.

Any designated wood, B4, banded two sides and two ends.

Bands to finish net width as specified, clear of any defect that may prevent required shaping (or molding). The purchaser may elect any suitable wood, or woods, for banded cores. Butt joints unless otherwise specified are permitted if tight. Standard width of bands shall be  $2\frac{1}{2}$  inches in the rough.

*Special banded cores.*—Mitered bands or any construction requiring bands other than those described above are to be considered special banded cores and complete details should appear in the specifications.

#### ROTARY CUT

*Grade A.*—A core of any designated wood of one piece and clear of open defects throughout.

*Grade No. 1.*—A core of any designated wood admitting two or more pieces of uniform thickness. No open joints permitted.

*Grade No. 2.*—A core of any wood admitting untaped joints and fractures, worm holes, open defects, splits, etc., without limit.

#### CROSSBANDING

*Grade A.*—A crossbanding of any designated wood of one piece and clear of open defects throughout.

*Grade No. 1.*—A crossbanding of any suitable wood admitting two or more pieces properly joined and taped and clear of open defects throughout.

*Grade No. 2.*—A crossbanding of any suitable wood admitting joints without limit and defects of such size and extent that will not impair the surface of the exterior veneer under which such crossbanding is used.

#### DIFFERENTIALS

The following panel constructions and sizes represent departures from the usual factory schedules in the manufacture of plywood and are considered as extras.

##### *Face veneers:*

Center matching.

Balanced matching.

Matching in pairs.

Matching in sets.

Matching off center.

Special face designations—combination of various woods, etc.

Gluing of joints in face veneer.

##### *Lumber cores, banded:*

Area—

Group 1.—Any dimension of 8 or more square feet.

Group 2.—Any dimension of from 4 to 8 square feet.

Group 3.—Any dimension of from 1 to 4 square feet.

Group 4.—Any dimension of less than 1 square foot.

Dimensions—Lengths over 48 inches. Widths over 30 inches.

## STANDARD SIZES AND QUANTITIES

The standard sizes of finished plywood shall be—

Lengths, ranging from 24 to 48 inches, inclusive.

Widths, ranging from 12 to 30 inches, inclusive.

The standard quantity in any individual order shall be not less than indicated below:

(Designated thickness)	(Quantity)
$\frac{3}{16}$ to $\frac{1}{4}$ inch thick	75 pieces of each designated standard size.
$\frac{3}{8}$ to $\frac{1}{2}$ inch thick	50 pieces of each designated standard size.
$\frac{5}{8}$ to $\frac{7}{8}$ inch thick	25 pieces of each designated standard size.

## TOLERANCES

*Thickness:*

A tolerance of  $\frac{1}{64}$  (0.016) inch over or under the specified thickness shall be allowed.

*Length and width:*

All commercial standard plywood shall be square within  $\frac{1}{16}$  inch.

A tolerance of  $\frac{1}{32}$  inch over or under the specified length and width shall be allowed in plywood 48 by 30 inches or smaller.

A tolerance of  $\frac{1}{16}$  inch over or under the specified length and width shall be allowed in plywood over 48 by 30 inches.

## GLOSSARY OF TERMS

*Banding* (also referred to as "railing").—A portion of wood of any specified kind extending around one or more sides of a piece of core usually with its grain extending the long way. This banding of solid wood facilitates shaping the edges of the piece or may be finished flat to cover over the several colors presented in the end or side grain of the core and crossbanding.

*Bands, cross.*—See Crossbanding.

*Birds-eye.*—Bird's-eye is due to local sharp depressions in the annual rings, accompanied by considerable fiber distortion. Once the depressions are formed, succeeding growth rings follow the same contour for many years. In plain-sawed lumber and rotary veneer the depressions are cut through crosswise and show a series of circlets, portions of annual rings, suggesting, rather remotely, a bird's eye.

*Blister figure.*—Blister figure consists of seeming knoll-like elevations in the wood. It is due to an uneven contour of the annual rings, and not to blisters or pockets in the wood as the name might indicate.

*Broken stripe.*—Broken stripe is a modification of the stripe figure, due to undulations in the annual growth of the tree, which produce changes in the angle of the fibers.

*Burl.*—A type of figure produced by cutting through burls which are wartlike protuberances on trees. They contain the dark pith centers of a large number of undeveloped buds.

*Centers.*—See Cores.

*Centers, banded.*—See Cores, banded.

*Chain figure.*—A succession of short cross markings of uniform character remotely suggesting cross links of a chain.

*Checks.*—Small splits running parallel to the grain of the wood caused chiefly by strains produced in seasoning.

*Cores.*—Cores, sometimes also referred to as centers, are the innermost portions of plywood. They may be of sawn lumber, either one piece or several pieces joined and glued, or they may be of veneer.

*Cores, banded.*—Cores that have been made with banding on one or more sides. *See* Banding.

*Crossbanding.*—Veneer used in the construction of plywood with five or more plies. In 5-ply construction it is placed at right angles between the core and faces.

*Cross fire.*—A distortion of the wood fibers of the tree which, cut the radial way, produce figures and high lights similar to a corrugated surface.

*Defects, open.*—Checks, splits, open joints, cracks, loose knots, worm holes, or other defects interrupting the smooth continuity of the surface.

*Doze.*—An incipient form of decay characterized by a dull and lifeless appearance of the wood accompanied by a lack of strength and a softening of wood substance.

*Figure.*—Figure is the pattern formed by peculiar arrangement of the elements within the tree and by reflected light caused by the peculiar arrangement of the wood fibers, and by the exposure of the medullary rays. The various kinds of figure are known by many different terms such as bird's-eye, burl, crotch, blister, etc.

*Flake, broken.*—A breaking or loosening of the flake (medullary ray) of quartered material most frequent in oak.

*Grain.*—A rather loose term applied to the vertical elements of wood as it occurs in the living tree. Grain is perhaps most easily delineated in certain woods by the presence of annual layers of more densely aggregated cells or by groups of prominent vessels which form the well-known growth rings and when these are severed they may become quite pronounced and the effect produced is referred to as "grain."

*Grain character.*—The pattern produced by cutting through growth rings and exposing the layers of prominent vessels, thus producing a varying pattern. This pattern is most pronounced in lumber or veneer cut tangentially (flat sawn) or in rotary-cut veneers.

*Grain, ruptured.*—A condition of slight breaks in the veneer caused by irregular grain or improper cutting.

*Half round.*—A manner of cutting veneer to bring out certain beauty of figure accomplished in the same manner as rotary cutting except that the piece being cut is secured to a "stay log," a device that permits the cutting of the log on a wider sweep than when mounted with its center secured in the lathe.

*Hardwoods.*—A general term used to designate the lumber produced from broad-leaved or deciduous trees in opposition to the so-called softwoods, those produced by evergreen or coniferous trees.

*Hair line.*—A thin perceptible line usually showing at a joint.

*Joints, open.*—A joint in which the two adjacent pieces of veneer do not fit tightly together.

*Knots.*—Cross section of a branch or limb whose grain usually runs at right angles to that of the piece in which it occurs.

*Knots, open.*—Where a portion of the wood substance of the knot has dropped out or where cross checks have occurred to present an opening.

*Knots, pin.*—A knot less than  $\frac{1}{4}$  inch in diameter.

*Loose side.*—See definition under "tight side."

*Matching, reversed.*—The matching of a veneer face by turning alternate adjacent sheets end for end.

*Matching, book.*—Turning alternate adjacent sheets over.

*Matching, slide.*—Laying adjacent sheets tight side up without turning.

*Mismatches.*—Parts of the panel in which the grain character or figure of adjacent portions of veneer do not come together symmetrically.

*Patches.*—Insertions of sound wood placed and glued into panels from which defective portions have been removed.

*Plywood.*—A product in which several plies or pieces of veneer (thin wood) are glued to each other or to a lumber core. The grain of any one ply is usually at right angles to the adjacent layers and the laminated structure is stronger than a solid piece of lumber of equal dimensions.

The use of the term is broadening and "plywood" may be considered to include products heretofore referred to as glued up (flat or bent) stock, cross-banded panels, panels, tops, laminated wood, two or more ply veneer and other similar products excepting glued lumber dimension stock.

*Quartered.*—A method of producing veneer by slicing or sawing to bring out a certain figure produced by the medullary or pith rays which is especially conspicuous in oak. The log is flitched in several different ways to allow the cutting of the veneer in a radial direction.

*Railing.*—See Banding.

*Ribbon stripe.*—This type of figure consists of alternating lighter and darker strips, running more or less the length of the sheet and varying from less than  $\frac{1}{4}$  inch to more than  $1\frac{1}{2}$  inches in width. It is pronounced only in quartered or nearly quartered material. It usually is due to differences in the reflection of light from adjacent layers of wood cut from trees with interlocked grain.

*Rope figure.*—A succession of short cross fire remotely suggesting the twist of a rope.

*Rotary cut.*—A manner of cutting veneer by which the entire log is mounted in a lathe and turned against a broad cutting knife which is set into the log at a slight angle.

*Sap.*—An abbreviated term for "sapwood" the lighter-colored wood substance occurring in the outer portion of the tree.

*Sliced.*—A manner of cutting veneer by which logs or sawn flitches are held securely in a slicing machine and thrust downward onto a large knife which shears off the veneer in sheets.

*Splits.*—Separations of wood fiber running parallel with the grain.

*Stain.*—Any discoloration of the wood substance. Common veneer stains are often produced by the chemical action of the iron in the cutting knife with the tannic acid in the wood and by the chemical action of glue.

*Streaks, mineral.*—Natural discolorations of the wood substance.

*Stripe, broken.*—See Broken stripe.

*Stripe, ribbon.*—See Ribbon stripe.

*Swirls.*—Irregular grain usually surrounding knots or crotches.

*Tight side.*—This term and its opposite, "loose side" are used to refer to veneer cut with a knife. The product as it is cut by the wedge-shaped or beveled knife may be curved, thus producing small ruptures on the convex side known as the "loose side." The opposite surface, strained slightly in compression, but free from any ruptures is known as the "tight side."

#### GENERAL CONFERENCE

Pursuant to a request of the Plywood Manufacturers Association, a general conference of manufacturers, distributors, and consumers was held in Chicago, Ill., on April 9, 1931, to consider the adoption of a quality standard for plywood. The following were present:

BARRETT, O. A., Empire (Ltd.).  
 CALHOUN, C. FRED, Underwood Veneer Co.  
 GEOEGEGEN, J. T., American Car & Foundry Co.  
 GIESE, W. J., Underwood Veneer Co.  
 GRADOLF, F. B., American Car & Foundry Co.  
 GRASER, J. H., Harmony Co.  
 GREEN, PAUL, Porter Bede Langtry Corporation.  
 HAAKE, A. P., National Association of Furniture Manufacturers.  
 HILL, PHILLIP S., Harbor Plywood Corporation.  
 JORGENSEN, O. H., The J. G. Brill Co.  
 KING, ALEXANDER D., Plywood Manufacturers Association.  
 KLINE, H. E., Louisville Veneer Mills.  
 KNIGHT, E. V., New Albany Veneering Co.  
 LANE, L. B., Armour Glue Works.  
 MARSH, HARMON W., The S. H. Smith Co.  
 MARSHALL, F. W., Wisconsin Veneer Co.  
 MEEKER, E. W., Hardwood Record.  
 NARTZIK, BENJ. B., J. J. Nartzik (Inc.).  
 PATCHEN, A. D., Jamestown Panel Co. (Inc.).  
 PHELPS, Miss B., Plywood Manufacturers Association.  
 PHILLIPS, W. A., The Cadillac Veneer Co.  
 RAU, ROSCOE R., National Retail Furniture Association.  
 SCOTT, C. E., Haskelite Manufacturing Corporation.  
 SMITH, C. B., Armour & Co.  
 STEIDLE, HARRY H., National Bureau of Standards.  
 WILKIN, PETER J., Roddis Co. and Veneer Manufacturers Co.  
 ZAUG, FRANK, American Plywood Corporation.

The conference held under the auspices of the division of trade standards, national Bureau of Standards, was presided over by Harry H. Steidle, while Alexander D. King, commissioner of the Plywood Manufacturers Association, outlined the desirability of a high quality standard and understandable terms as a base line of operations for the plywood industry.

The proposed standard was thoroughly discussed and numerous constructive changes were made. The outstanding decision of the conference was that of adhering to only one system of designations for the several grades. In the original proposal it was thought necessary to apply the terminology used in some species namely select, standard, and common, along with that used for other species which designates the grades as A, No. 1, No. 2, and No. 3.

The possibility for confusion and misunderstanding in this multiple system met with strong opposition especially from representatives of the consuming industries. Dr. A. P. Haake, director of the National Association of Furniture Manufacturers, forcefully expressed his opposition to any system of grade designations which would lead

to confusion in the minds of the furniture designer or plywood buyer. He said in substance that the occasion represented a splendid opportunity for better understanding between plywood manufacturers and their principal customers, the furniture industry, and urged the adoption of the more explicit of the two grade designations, namely, A, No. 1, No. 2, and No. 3.

Roscoe R. Rau, managing director, of the National Retail Furniture Association, strongly concurred in the opinions expressed adding that, in the interest of better merchandising, they are carrying on a plan of education among retail furniture salesmen and therefore were strongly in favor of one simple set of grade designations.

O. H. Jorgensen of the J. G. Brill Co., was among those in favor of a single system of grade names and in this contention was strongly supported by LeRoy E. Kern, technical secretary of the American Institute of Architects, in his expressions made prior to the general conference.

The general consensus of opinion was decidedly favorable to the adoption of a high standard of quality for the manufacture, sale, and use of plywood, and upon motion of Col. E. V. Knight, seconded by H. E. Kline, it was unanimously voted:

To approve for recommendation to the entire industry the commercial standard grading rules proposed by the Plywood Manufacturers Association with the adjustments as made.

#### STANDING COMMITTEE

A standing committee was appointed to represent the various interests of the plywood industry and to receive all comments and suggestions for the improvement of the commercial standard.

No definite interval was fixed for revision of the standard but the committee may meet at the call of the chairman when revision appears necessary.

The standing committee approved by the conference consists of the following:

- E. V. KNIGHT, chairman, New Albany Veneering Co., New Albany, Ind.
  - F. LEO SMITH, member, American Institute of Architects.
  - N. M. WILLSON, Pearl City Plywood Co., Jamestown, N. Y.
  - CHARLES PERRY, Perry Plywood Corporation, High Point, N. C.
  - HARRY E. KLINE, Louisville Veneer Mills, Louisville, Ky.
  - W. E. PERRY, Algoma Panel Co., Algoma, Wis.
  - LAWRENCE OTTINGER, U. S. Plywood Co., New York, N. Y.
  - A. P. HAAKE, National Association of Furniture Manufacturers, Chicago,
- III.
- JOSEPH R. MARDIS, Davis-Birely Table Co., Shelbyville, Ind.
  - G. MELVIN HARLACKER, Pennsylvania Furniture Co., York, Pa.
  - ROSCOE R. RAU, National Retail Furniture Association, Chicago, Ill.
  - T. R. WILLIAMS, Ichabod Williams Co., New York, N. Y.
  - HARRY H. STEIDLE, ex officio secretary, Bureau of Standards, Washington,
- D. C.

#### EFFECTIVE DATE

The effective date for production and sale of plywood under the commercial standard was fixed at September 1, 1931.

## CERTIFICATION PLAN

The conference voted its approval of the certification plan for application to plywood made in accordance with the commercial standard specifications.

The certification plan as applied by the Bureau of Standards to commercial standards consists in the compilation and distribution of lists of manufacturers who are willing, when requested to do so, to certify to purchasers that products supplied by them comply with all the requirements and tests set forth in nationally recognized commercial standards. The plan is also applied to selected Federal specifications.

These lists are available on request to individual consumers, consumer groups, companies, and in fact to any prospective purchasers, for their guidance.

The benefits now derived from the use of specifications by large consumers are thus made immediately available to the small consumer, with incidental advantage to the larger consumers of convenience in ordering and accepting material with fewer laboratory tests. The manufacturer also benefits from the well-known economies accompanying mass production.

The lists of manufacturers "willing to certify" to the quality of certain commodities are made by corresponding with, as nearly as possible, all the manufacturers of that product and listing only those who signify their willingness to certify to the purchaser, when requested to do so, that the commodities delivered actually comply with the commercial standard.

Obviously, the purchaser making use of the lists of willing-to-certify manufacturers, will select therefrom such manufacturers as are known (or assumed) by him to be reliable.

The trend toward the purchase of materials of certified quality from sources shown on such willing-to-certify lists supplies added incentive to standardization on the part of other producers, and thus the benefits of the certification plan will be felt by purchasers either directly or indirectly, whether or not they make use of the plan themselves.

## COMMERCIAL STANDARDS SERVICE

Industry has long sensed the need for a wider application and use of specifications developed and approved by nationally recognized organizations. To assist these bodies and the producers and consumers in securing this result and as a natural outgrowth of the movement toward elimination of waste through simplified practice, the Bureau of Standards has set up a procedure under which specifications, properly indorsed, may be printed as official publications of the Department of Commerce and promulgated as "commercial standards." This service parallels that of simplified practice in many respects and is available only upon request.

Broadly speaking, the aim is to continue the same character of cooperative service in this field that is being rendered in simplification. The division of trade standards is not designed to act as a standardizing body, nor will it engage in the preparation of specifications. Its service is mainly promotional in character, since its chief mission is to invite attention to a standard or a specification which any branch of industry may want to promulgate on a nationwide basis; to determine its eligibility for promulgation; to publish and broadcast it in the event the prerequisites of procedure have been met, including a satisfactory majority acceptance; to facilitate the application of the certification plan for the assurance and convenience of the purchaser; to provide means for periodic audits of adherence; and to cooperate with the Bureau of Foreign and Domestic Commerce in determining the desire of industry relative to translocation and promulgation of such specifications as a basis for foreign commerce.

In general, it may be said that a simplification covers types, sizes, and varieties of a commodity which are retained by industry on the basis of demand, whereas a commercial standard establishes definite requirements as to grade, quality, or dimensional tolerances in addition to any limitation of variety desired and accepted by the industry.

### ORGANIZATION AND DUTIES OF STANDING COMMITTEE

In order to carry on the aims and desires of the industry in the standardization of their product, a standing committee is appointed at the general conference. This committee consists of members from each division of the industry, namely, producers, distributors, and consumers, and thus reflects the well-balanced viewpoint of all concerned.

The members of the committee receive all suggestions regarding the commercial standard and consider its revision in the event that such action is desirable and mutually beneficial.

If the commercial standard does not warrant revision, it is reaffirmed in its existing form, but if any important changes are

found desirable, their adoption is recommended by the committee, whereupon the industry is again solicited for written acceptance of the standard in its revised form.

The committee is in effect a centralizing agency for criticisms and comments regarding the commercial standard and is charged with the responsibility of recommending revisions to keep the standard abreast with current industrial practice.

The proper functioning of the committee requires that, when necessary, its members be willing to attend meetings held at some central place, although in many cases it will be possible to conduct the work by correspondence.

When any deceptions in reference to the commercial standard are reported to the standing committee, it applies moral suasion or such other corrective measures as seem desirable. The Department of Commerce has no "police power" to compel adherence, therefore it is incumbent upon the standing committee to do all in its power to encourage all divisions of the industry to follow the provisions of the commercial standard and contribute in every way possible to its general adoption and usefulness.

#### YOUR COOPERATION

As a producer, distributor, or consumer of some of the commodities for which commercial standards have already been established, you are in a position to avail yourself of the benefits arising from the use of quality standards and incidentally to add impetus to this method of eliminating waste.

The first step is a declaration in favor of the standard by recording your intention to adhere, as closely as circumstances will allow, to the standards for those products which you may buy or sell.

The receipt of your signed acceptance will permit the listing of your company in new editions of the commercial standards that you accept.

You will, of course, want to examine any commercial standards before signing a formal acceptance. The Bureau of Standards will, therefore, furnish a copy of any standard under consideration for acceptance. A list of current commercial standards is given on the inside of the rear cover page.

The publications may also be secured singly or in quantities at a nominal price from the Government Printing Office. Prices will be furnished upon request.

The acceptance of a commercial standard is an entirely voluntary action and applies to the production, sale, and use of stock items. It is not meant to interfere with the introduction, manufacture, or sale of special sizes and types sometimes required.

Trade associations and individual companies often distribute large numbers of the printed standard for the information and guidance of their members or customers. In such cases it is possible to extend the scope and degree of adherence by urging each recipient to send in an acceptance, bearing in mind that the practical value of any standardization is measured by the observance it receives.

An acceptance form for the commercial standard herein covered is included on page 21.

### ACCEPTANCE OF COMMERCIAL STANDARD

(Please sign and return this sheet to division of trade standards, Bureau of Standards, Washington, D. C.)

Date-----

DIVISION OF TRADE STANDARDS,  
BUREAU OF STANDARDS,  
*Washington, D. C.*

GENTLEMEN: We, the undersigned, do hereby accept the original draft of the Commercial Standard as our standard practice in the { production<sup>2</sup> } of plywood (hardwood and { distribution<sup>2</sup> } eastern red cedar) beginning use<sup>2</sup> -----, and will use our best effort in securing its  
(Date)  
general adoption.

To permit intelligent review of the effectiveness of the commercial standard every year by an accredited committee of all interests, working in cooperation with the Department of Commerce, we plan to supply all data, upon request, which may be necessary for the development of constructive revisions. It is understood that any suggested modifications will be submitted as soon as formulated, and shall not be promulgated until accepted in form similar to this recommendation.

(Cut on this line)

Signature-----

(Kindly typewrite or print the following lines:)

Title-----

Company-----

Street address-----

City and State-----

We are members of the following associations or other organizations interested in the production, sale, or use of plywood (hardwood and eastern red cedar):

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<sup>2</sup> Please designate which group you represent by drawing lines through the other two. In the case of related interests, trade papers, colleges, etc., desiring to record their general approval, the words "in principle" should be added after the signature.

## TO THE ACCEPTOR

In signing the acceptance blank, please bear the following points clearly in mind:

1. *Adherence.*—The Department of Commerce has no regulatory powers to enforce adherence to the commercial standards. Instead, this waste-elimination program is based on voluntary cooperation and self-government in industry. To make this specific standardization operate as a satisfactory example of self-government, it is highly desirable that it be kept distinct from any plan or method of governmental regulation or control. It will be successful according to the degree to which manufacturers, distributors, and purchasers adhere to its terms and conditions.

2. *The industry's responsibility.*—The department cooperates only on the request of the industry, and assumes no responsibility for industrial acceptance or adherence. This program was developed by the industry on its own initiative. Its success depends wholly on the active cooperation of those concerned.

3. *The acceptor's responsibility.*—You are entering into an entirely voluntary arrangement, whereby the members of the industry—the distributors and consumers of the product, and others concerned—hope to secure the benefits inherent in commercial standardization. Those responsible for this standard realize that instances may occur in which it will be necessary to supply or purchase items not included therein. The purpose is, however, to secure wider support for nationally recognized standards covering grade, quality, and other characteristics of products. Consumers can make the program a success if, in their purchasing, they will make a definite and conscientious effort to specify in terms of this commercial standard.

4. *The department's responsibility.*—The function performed by the Department of Commerce is fourfold: First, to act as a referee to insure adequate consideration of the needs of all interests; second, to supply such assistance and advice in the development of this program as past experience with similar programs may suggest; third, to solicit and record the extent of adoption and adherence to the standard; and fourth, to add all possible prestige to this standardization movement by publication and promulgation if and when it is adopted and accepted by all elements directly concerned.

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| 5-29.  | Steel pipe nipples.   | 27-30. | Plate glass mirrors.  |
| 6-31.  | Wrought-iron pipe nipples (first revision).                 | 28-32. | Cotton fabric tents, tarpaulins, and covers.                    |
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| 8-30.  | Plain and thread plug and ring gage blanks.                 | 30-31. | Colors for sanitary ware.                                       |
| 9-29.  | Builders' template hardware.                                | 31-31. | Red cedar shingles.   |
| 10-29. | Brass pipe nipples.   | 32-31. | Cotton cloth for rubber and pyroxylin coating (in preparation). |
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| 12-29. | Domestic and industrial fuel oils.                          | 34-31. | Bag, case, and strap leather.                                   |
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| 17-30. | Diamond core drill fittings.                                |        |   |
| 18-29. | Hickory golf shafts.  |        |   |
| 19-30. | Foundry patterns of wood.                                   |        |   |
| 20-30. | Staple vitreous china plumbing fixtures.                    |        |   |
| 21-30. | Interchangeable ground glass joints.                        |        |   |

NOTE.—Those interested in commercial standards with a view toward accepting them as a basis of everyday practice in their industry may secure copies of the above standards, while the supply lasts, by addressing the Division of Trade Standards, Bureau of Standards, Washington, D. C.