

CS45-36
Plywood; Douglas Fir

U. S. DEPARTMENT OF COMMERCE
DANIEL C. ROPER, Secretary
NATIONAL BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

DOUGLAS FIR PLYWOOD

(DOMESTIC GRADES)

(SECOND EDITION)

COMMERCIAL STANDARD CS45-36

Effective Date for New Production November 1, 1936



A RECORDED STANDARD OF THE INDUSTRY

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1936

PROMULGATION
of
COMMERCIAL STANDARD CS45-36
for
DOUGLAS FIR PLYWOOD
(DOMESTIC GRADES)
(SECOND EDITION)

On August 17, 1932, manufacturers, distributors, and users of Douglas fir plywood approved the adoption of standard grading rules for the guidance of the Douglas fir plywood industry. These grading rules were accepted by the industry and promulgated as Douglas Fir Plywood, Commercial Standard CS45-33.

On August 3, 1936, the Douglas Fir Plywood Association recommended certain changes in the Commercial Standard for Douglas Fir Plywood, CS45-33. The recommended changes were made in the interest of greater clarity of grades and to insure a better product to distributors and consumers. The recommendations were approved by the Standing Committee and accepted by the industry for promulgation by the United States Department of Commerce, through the National Bureau of Standards.

The revised standard is effective for new production beginning November 1, 1936.

Promulgation recommended.

I. J. Fairchild,
Chief, Division of Trade Standards.

Promulgated.

Lyman J. Briggs,
Director, National Bureau of Standards.

Promulgation approved.

Daniel C. Roper,
Secretary of Commerce.

DOUGLAS FIR PLYWOOD

DOMESTIC GRADES

(Second Edition)

COMMERCIAL STANDARD CS45-36

PURPOSE

1. Because of the extended application of Douglas fir plywood to a large number of new uses the following standard grading rules are offered as a universal basis of understanding in the industry. General adoption and use of this standard will facilitate procurement of the proper grade of material for its varied uses and provide a better understanding between buyer and seller. Architects, engineers, contractors, industrial users, and home owners will thus be able to specify their needs from nationally recognized grades.

SCOPE

2. These rules cover Douglas fir plywood; a laminated board for paneling, sheathing, concrete forms, cabinet work, and industrial uses. In addition there are included grade specifications for door panels, standard sizes, size tolerances, reinspection rules, and a glossary of terms.

DEFINITION

3. Douglas fir plywood is a built-up board of laminated veneers in which the grain of each piece is at right angles to the one adjacent to it. The kiln dried veneer is united under high pressure with a water-resistant glue, making the joints as strong or stronger than the wood itself. The alternating direction of the grain with each contiguous layer of wood equalizes the strains and in this way minimizes shrinkage and warping of the product and prevents splitting.

GENERAL REQUIREMENTS

4. All Douglas fir plywood sold as of commercial standard quality shall meet the following general requirements:

5. *Workmanship.*—It shall be smoothly sanded on two sides unless otherwise specified. It shall be well manufactured and free from blisters, laps, etc., except as permitted in the specific rules for the various grades.

6. *Construction.*—Veneers $\frac{1}{2}$ inch or more shall be used in the construction of panels $\frac{1}{4}$ inch and upward in thickness. The veneer thickness shall be measured before the panel is sanded.

7. *Gluing.*—It shall be tightly glued with water-resistant glue.

8. *Loading or packing.*—It shall be securely loaded or packed to insure delivery in a clean and serviceable condition.

DETAIL REQUIREMENTS

9. Douglas fir plywood shall be graded according to both sides of the piece into the following standard grades. The grade descriptions set forth the minimum requirements, and therefore the majority of panels in any shipment will exceed the specification given.

10. *Good 2-Sides (G2S)*.—Each face shall be of a single piece of smoothly cut veneer of 100-percent heartwood, free from knots, splits, checks, pitch pockets, and other open defects. The faces shall be a yellow or pinkish color without stain. Shims that occur only at the ends of panels and inconspicuous well-matched small patches not to exceed $\frac{3}{8}$ inch wide by $2\frac{1}{2}$ inches long shall be admitted. This grade is recommended for uses where a light stain or natural finish is desired.

11. *Good 1 Side (G1S)*.—One face shall be equal to that described under "Good 2 Sides" grade, while the opposite face shall be equal to the "Sound 2 Sides" grade described below.

12. *Sound 2 Sides (S02S)*.—Each face shall be of one or more pieces of firm smoothly cut veneer. When of more than one piece, it shall be well joined and reasonably matched for grain and color at the joints.

13. It shall be free from knots, splits, checks, pitch pockets, and other open defects. Streaks, discolorations, sapwood, shims, and neatly made patches shall be admitted. This grade shall present a smooth surface suitable for painting.

14. *Wallboard (WB)*.—This is a 3-ply board of $\frac{1}{16}$ -inch rough, $\frac{1}{4}$ -inch or $\frac{3}{8}$ -inch sanded, or 5-ply $\frac{1}{2}$ -inch sanded thickness, made only in standard wallboard sizes, the face of which shall be of one or more pieces of firm, smoothly cut veneer. When of more than one piece it shall be well joined and reasonably matched for grain and color at the joints. It shall be free from knots, splits, pitch pockets, and other open defects. Streaks, discolorations, sapwood, shims, and neatly made patches shall be admitted. The face on this grade shall present a smooth surface suitable for painting. The backs shall contain knot holes or pitch pockets, splits, and other defects in number and size that will not seriously affect the strength or serviceability of the panel and which cannot reasonably and economically be repaired to make a sound face. All wallboard panels shall be so designated by grade marking each panel.

15. *Sheathing*.—This is an unsanded plywood made only in the following thicknesses: $\frac{1}{16}$ or $\frac{3}{8}$ inch 3-ply or $\frac{1}{2}$ inch 5-ply. Both faces shall contain solid knots or knot holes or pitch pockets, splits and/or other defects in number and size that will not seriously affect the strength or serviceability of the panel and which cannot reasonably and economically be repaired to make a sound face. No face repairs shall be made in this grade.

16. *Automobile and industrial stock (rough)*.—Faces of panels shall be free from knot holes. Tight knots, straight and tight checks shall be admitted. Pieced faces no defect. Core and cross bands shall be of firm stock. Knot holes in cores and cross bands, up to $1\frac{1}{4}$ inches in diameter permitted.

17. *Concrete form plywood*.—Concrete form plywood shall be built up of three or five thicknesses of veneer, of which the two outside plies are at least $\frac{1}{8}$ inch thick before sanding. An occasional knot hole is

permissible in the center or core of 5-ply panels only but no knot holes are permitted in cross banding.

18. Faces shall be free from knots or open defects. The glue used shall be especially prepared for this purpose and be very highly water-resistant. All concrete form plywood shall be so designated by grade marking each panel. (When so ordered, concrete form plywood will be treated with a satisfactory form oil or other preparation.)

DOOR PANELS

19. *Number 1 door panel (no. 1 D. P.)*.—The grade of no. 1 door panels shall be the same as for good 2 sides panels.

20. *Number 2 door panel (no. 2 D. P.)*.—Each face shall be of a single piece of veneer that is free of knots and other open defects, but may admit medium stain and discoloration. Patches not to exceed $\frac{1}{8}$ by $2\frac{1}{2}$ inches and shims of any size, when reasonably selected for color and grain, are admissible.

TABLE 1.—Standard Douglas fir plywood sizes

Item	Width (inches)		Length (inches)	Thickness (inches)
Standard panels	12	26	48	(After sanding)
	14	28		$\frac{3}{16}$ (3 ply) $\frac{3}{4}$ (5 ply)
	16	30		$\frac{1}{4}$ (3 ply) $1\frac{1}{16}$ (5 or 7 ply)
	18	36		$\frac{5}{16}$ (3 ply) $\frac{7}{8}$ (7 ply)
	20	42		$\frac{3}{8}$ (3 ply) $1\frac{5}{16}$ (7 ply)
	22	48		$\frac{7}{16}$ (5 ply) 1 (7 ply)
	24			$\frac{1}{2}$ (5 ply) $1\frac{1}{16}$ (7 ply)
				$\frac{9}{16}$ (5 ply) $1\frac{1}{4}$ (7 ply)
Wallboard	30	60	$\frac{3}{16}$ (3 ply unsanded)	
	32		$\frac{1}{4}$ (3 ply sanded 2 sides)	
	36		$\frac{3}{8}$ (3 ply sanded 2 sides)	
	48		$\frac{1}{2}$ (5 ply sanded 2 sides)	
Sheathing	48	60	$\frac{5}{16}$ (3 ply unsanded)	
		72	$\frac{3}{8}$ (3 ply unsanded)	
		84	$\frac{5}{8}$ (5 ply unsanded)	
		96		
Automobile and industrial	As ordered	As ordered	$\frac{1}{2}$ (5 ply unsanded)	
			$\frac{9}{16}$ (5 ply unsanded)	
			$\frac{5}{8}$ (5 ply unsanded)	
			$1\frac{1}{16}$ (5 ply unsanded)	
			$\frac{3}{4}$ (5 ply unsanded)	
			$\frac{7}{8}$ (5 or 7 ply unsanded)	
Concrete form panels	Same as standard panels	Same as standard panels	$\frac{1}{2}$ (3 or 5 ply sanded 2 sides)	
			$\frac{9}{16}$ (5 ply sanded 2 sides)	
			$\frac{5}{8}$ (5 ply sanded 2 sides)	
			$1\frac{1}{16}$ (5 ply sanded 2 sides)	
			$\frac{3}{4}$ (5 ply sanded 2 sides)	

SIZE TOLERANCES

21. A tolerance of $\frac{1}{64}$ (0.0156) inch over or under the specified thickness shall be allowed on sanded panels and a tolerance of $\frac{1}{32}$ (0.0312) inch on unsanded panels.

22. A tolerance of $\frac{1}{32}$ (0.0312) inch over or under the specified length and/or width shall be allowed but all panels shall be square within $\frac{1}{8}$ (0.1250) inch.

INSPECTION

23. All plywood guaranteed to conform to the commercial standard grading rules is sold subject to inspection in the white only, except concrete form material which may have a priming of oil or other preparation before shipment. All complaints regarding the quality of any shipment must be made within 15 days from receipt thereof.

24. Where the grade of any plywood shipment is in dispute and a reinspection is demanded, the cost of such reinspection shall be borne by the seller and the shipment settled for on the basis of the reinspection report if the shipment is more than 5 percent below grade.

25. If reinspection establishes the shipment to be 5 percent or less below grade, the buyer pays the cost of reinspection and pays for the shipment as invoiced.

CERTIFICATION

In its desire to preserve the high standards of quality which have been established by the industry, the Douglas Fir Plywood Association maintains an inspection bureau for the careful grading of the product of its members. By the use of certificates, facsimile of which appears below, the distributor or consumer is assured of receiving plywood of the grade specified.

Douglas Fir Plywood Association
INSPECTION BUREAU

CERTIFICATE OF INSPECTION

The undersigned, a Licensed Inspector of the Douglas Fir Plywood Inspection Bureau, hereby certifies that the plywood identified below has been inspected and found to comply with the grade specifications of

Order No. _____
Quantity _____
Mill No. _____
Date _____

U. S. Department of Commerce
Commercial Standard CS 45-36

Inspector for the Douglas Fir Plywood Inspection Bureau _____

Sworn and Subscribed to before me this _____ day _____ 19____

Notary Public _____

SEAL
DOUGLAS FIR PLYWOOD ASSOCIATION INSPECTION BUREAU
TACOMA, WASH. 1936

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GLOSSARY OF TERMS

Centers.—See *Cores.*

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

Cores.—Cores or centers are the innermost layer in plywood construction.

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 cores and faces.

Defects, open.—Checks, splits, open joints, cracks, loose knots, and other defects interrupting the smooth continuity of the panel surface.

Heartwood.—Sometimes referred to as “heart”—the darker-colored wood occurring in the inner portion of the tree.

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

Knot holes.—Voids produced by the dropping of knots from the wood in which they were originally embedded.

Lap.—A condition where the veneers used are so misplaced that one piece overlaps the other rather than making a smooth butt joint.

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

Pitch pockets.—A pitch pocket is a well-defined opening between rings of annual growth, usually containing, or which has contained, more or less pitch, either solid or liquid.

Pitch streaks.—A pitch streak is a well-defined accumulation of pitch in a more or less regular streak.

Sapwood.—Sometimes referred to as “sap”—the lighter-colored wood occurring in the outer portion of the tree.

Shim.—A long, narrow patch not more than 3/16 inch wide.

Streaks.—See *Pitch streaks*.

METHOD OF ORDERING

The established procedure in specifying size and grade of plywood is to name the number of plies, width, length, grade, finished thickness, and whether sanded or unsanded.

Width always refers to distance across the grain of the face plies; length refers to the distance along the grain. Width should always be specified first.

If, for example, you require 100 pieces of plywood ¼ inch thick, 48 inches wide, and 72 inches long, one side of which is to be nailed against a wall where it will not show, but the other side is to be exposed and finished in a light stain or natural finish, you should order this material as follows:

100 pcs., 3-ply, 48" x 72", Good 1 Side, Sanded 2 Sides to ¼"

For most uses sanded panels are desirable, but there are occasional uses where unsanded panels, of a “Sound” or other grade, are satisfactory. Such panels should be specified, for example—

100 pcs., 3-ply, 48" x 72", Sound 2 Sides, ¼", unsanded

For certain types of service, special features are desirable in plywood panels, such as oiling and special water-resistant glue for concrete forms; extra-thick faces for certain architectural treatments, etc. In such cases, the special treatment or feature should be stated after the standard specification. For example, a “Standard Sound 2 Sides” panel of ⅜ inch thickness is desired for exterior use to be manufactured with special water-resistant glue. The order should read:

100 pcs., 3-ply, 48" x 96", Sound 2 Sides, Sanded 2 Sides to ⅜", manufactured with special water-resistant glue. (Add further special requirements.)

GRADE USE CLASSIFICATION FOR DOUGLAS FIR PLYWOOD

The following chart is offered by the Douglas Fir Plywood Association, as a rough guide to the grades generally suitable to the various uses listed:

Use	Grades						Automobile industrial stock
	Good 2 sides	Good 1 side	Sound 2 sides	Wall-board	Form plywood	Sheathing	
Amusement-park devices.....			X	X			
Archways.....		X		X			
Auto-body parts.....			X				X
Auto trailers.....	X		X				X
Base molding.....		X		X			
Benches.....			X				
Bins.....			X	X			
Birdhouses.....					X		
Bookcases.....		X	X				
Boxes, trays, etc.....		X	X				
Breakfast nooks.....		X	X	X			
Bulletin boards.....				X			
Cabinets:							
General.....		X	X				
Ice cream.....		X	X				
Kitchen.....		X	X				
Medicine.....		X	X				
Ceilings.....				X			
Chests.....			X				
Church pews.....	X		X				
Closets.....				X			
Clothes chutes.....				X			
Concrete forms.....					X		
Counter fronts.....		X					
Desks.....		X					
Display racks.....	X		X				
Drawers and drawer bottoms.....			X				
Farm buildings.....			X	X	X	X	
Fixtures, store.....	X	X	X				
Flooring.....		X		X			
Flower boxes.....			X		X		
Furniture.....	X	X	X				
Garages.....			X	X	X	X	
Houses, play.....					X		
Ironing boards.....		X	X				
Lockers.....			X				
Manual training uses.....	X	X	X	X	X		
Mirror backs.....				X			
Paneling.....		X		X			
Partitions.....	X		X				
Radio cabinets.....							X
Refrigerators.....			X				X
Screens (folding).....	X		X				
Sheathing.....				X		X	
Shelving.....			X	X			
Subflooring.....						X	
Sun room, porch.....				X			
Table tops.....		X		X			
Toys.....		X	X				
Trunks.....			X				
Wardrobes.....			X				
Walls.....		X		X			
Window displays.....	X						
Window seats.....		X					
Window valances.....	X						
Work benches.....			X	X			

EFFECTIVE DATE

The standard became effective for new production on November 1, 1936.

STANDING COMMITTEE

The following comprises the membership of the standing committee, which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Each association nominated its own representatives. Comment concerning the standard and suggestions for revision, may be addressed to any member of the committee or to the Division of Trade Standards, National Bureau of Standards, which acts as secretary for the committee.

RALPH BRINDLEY (chairman), The Wheeler Osgood Sales Corporation, Tacoma, Wash.

BRUCE CLARK, Elliott Bay Mill Co., 600 West Spokane Street, Seattle, Wash.

M. SEKSTROM, Olympia Veneer Co., Inc., Olympia, Wash.

H. S. MURPHY, Hugh S. Murphy & Co., 828 Tacoma Building, Tacoma, Wash.;
Representing National-American Wholesale Lumber Association.

CHARLES W. JACOB, John Bader Lumber Co., 2020 Clybourne Avenue, Chicago, Ill. Representing National Retail Lumber Dealers Association.

PHILIP GARLAND, Oregon-Washington Plywood Co., 1549 Dock Street, Tacoma, Wash.

HISTORY OF PROJECT

Pursuant to a request from the manufacturers of Douglas fir plywood a general conference of manufacturers, distributors, and users of the product was held at the Winthrop Hotel, Tacoma, Wash., on August 17, 1932, to consider the adoption of standard grading rules for the guidance of the industry.

Manufacturers representing approximately 80 percent of the production of Douglas fir plywood were in attendance as well as others interested in the distribution and use of the product.

The proposed standard that had been tentatively drafted by a committee of manufacturers was thoroughly discussed and several constructive changes were made.

The general opinion of the conference was decidedly favorable to the adoption of definite grades for the manufacture, sale, and use of Douglas fir plywood and it was unanimously voted:

To approve for recommendation to the entire industry
the Commercial Standard for Douglas Fir Plywood
with the adjustments as made by the conference.

FIRST REVISION

The standing committee as a result of an industry conference held in Tacoma, Wash., on August 3, 1936, recommended the modifications embraced in the present edition and further urged their publication as a separate document from the standard covering export grades.

The recommended revision was circulated on September 11, 1936, for written acceptance with the result that the revised standard was accepted and authorized by the industry for publication as Douglas Fir Plywood (Domestic Grades) (Second Edition), Commercial Standard CS45-36.

ACCEPTANCE OF COMMERCIAL STANDARD

This sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date

Division of Trade Standards,
National Bureau of Standards,
Washington, D. C.

Gentlemen:

Having considered the statements on the reverse side of this sheet, we accept the commercial standard CS45-36 as our standard of practice in the

Production ¹ Distribution ¹ Use ¹

of Douglas Fir Plywood (Domestic Grades).

We will assist in securing its general recognition and use, and will cooperate with the standing committee to effect revisions of the standard when necessary.

Signature

(Kindly typewrite or print the following lines)

Title

Company

Street address

City and State

¹ 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.

Cut on this line.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial standards are commodity specifications voluntarily established by mutual consent of the industry. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but, since they represent the will of the industry as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish for specific commodities nationally recognized grades of consumer criteria and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard, and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard where practicable in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function performed by the Department of Commerce in the voluntary establishment of commercial standards on a Nation-wide basis is fourfold: First, to act as an unbiased coordinator to bring all branches of the industry together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by companies representing a satisfactory majority of production, the success of the project is announced. If, however, in the opinion of the standing committee of the industry or the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

The organizations and individuals listed below have accepted these grading rules as their standard of practice in the production, distribution, and use of Douglas fir plywood for the domestic trade. Such endorsement does not signify that they may not find it necessary to deviate from the standard nor that producers so listed guarantee all of their products to conform with the requirements of this standard. Therefore specific evidence of quality certification should be obtained where desired.

ASSOCIATIONS

- American Institute of Architects, The, Washington, D. C. (In principle.)
 American Specification Institute, Chicago, Ill.
 Associated General Contractors of America, Inc., Carolinas Branch, Charlotte, N. C.
 Central Committee on Lumber Standards, Washington, D. C.
 Douglas Fir Plywood Association, Tacoma, Wash. (In principle.)
 Illinois Lumber and Material Dealers Association, Inc., Springfield, Ill.
 National-American Wholesale Lumber Association, Inc., New York, N. Y.
 National Hardwood Lumber Association, Chicago, Ill. (In principle.)
 National Lumber Manufacturers Association, Washington, D. C.
 National Oak Flooring Manufacturers Association, Memphis, Tenn. (In principle.)
 Ohio Association of Retail Lumber Dealers, The, Xenia, Ohio.
 Southern Cypress Manufacturers Association, Jacksonville, Fla. (In principle.)
 Western Red Cedar Lumber, Seattle, Wash. (In principle.)
 Wisconsin Retail Lumbermens Association, Milwaukee, Wis. (In principle.)
- Adams Lumber Co., Inc., The George, Inwood, N. Y.
 Aetna Cabinet Co., Indianapolis, Ind. (In principle.)
 Aircraft Plywood Corporation, Seattle, Wash.
 Allen, Harris C., San Francisco, Calif.
 Allen Manufacturing Co., Ltd., Shreveport, La.
 American Houses, Inc., New York, N. Y.
 American Lumberman, Seattle, Wash. (In principle.)
 American Plywood Corporation, New London, Wis.
 Andrews Lumber Co., C. E., New Bethlehem, Pa.
 Angelina Building Material Co., Lufkin, Tex.
 Anson Gilkey & Hurd Co., Merrill, Wis.
 Arcy Corporation, The, New York, N. Y.
 Arizona Sash Door and Glass Co., Phoenix, Ariz.
 Audubon Furniture Co., Henderson, Ky.
 Austin, Frank Lyman, Burlington, Vt.
 Bader Lumber Co., John, Chicago, Ill.
 Baker & Vogel, Seattle, Wash. (In principle.)
 Barnes Lumber Co., W. F. & J. F., Waco, Tex.
 Barney, Wm. Pope, Philadelphia, Pa.
 Barthmaier, Eugene V., Philadelphia, Pa.
 Bass, Obadiah, Lexington, Ky.
 Beaver Falls Planing Mill Co., Beaver Falls, Pa.
 Beeson, Carroll O., Crawfordsville, Ind.
 Bial, George F., Hasbrouck Heights, N. J.
 Binswanger & Co., Inc., Richmond, Va.
 Bishop, Horatio W., Los Angeles, Calif.

FIRMS

- Abel, Inc., Seattle, Wash.
 Aberdeen Plywood Co., Aberdeen, Wash.
 Acker, Arthur L., Los Angeles, Calif.
 Ackerman, Frederick L., New York, N. Y.
 Adams & Kelly Co., Omaha, Nebr.

- Blithe, Wesley Leshar, Philadelphia, Pa.
 Bogner, Harry, Milwaukee, Wis.
 Booth & Boyd Lumber Co., Saginaw, Mich.
 Borden, Guiney & Kendall Co., Fall River, Mass.
 Bosman & Casson, Harrison, N. J.
 Botsford Lumber Co., Winona, Minn.
 Brainerd, Harry B., New York, N. Y.
 Braseth & Houkom, Fargo, N. Dak.
 Brazer, Clarence W., Chester, Pa.
 Brereton, Bernard, Seattle, Wash. (In principle.)
 Brill Co., The J. G., Philadelphia, Pa.
 Brown, Wheelock, Harris, Stevens, Inc., New York, N. Y.
 Brust, Peter, Milwaukee, Wis.
 Buechner & Orth, St. Paul, Minn.
 Buffalo Plywood Corporation, Buffalo, N. Y.
 Buffelen Lumber and Manufacturing Co., Tacoma, Wash.
 Burritt Co., The A. W., Bridgeport, Conn.
 Burrow Lumber Co., Canyon, Happy, Perryton, Tex., and Beaver, Okla.
 California Panel and Veneer Co., Los Angeles, Calif.
 Cannon & Fetzer, Salt Lake, Utah.
 Capitol Plywood Co., Olympia, Wash.
 Carder, Macon O., Amarillo, Tex.
 Carlander, Guy A., Amarillo, Tex.
 Carpenter, Charles A., Rochester, N. Y.
 Carroll, John, Atlantic City, N. J.
 Carrom Co., The, Ludington, Mich.
 Cellarius, Chas. F., Cincinnati, Ohio.
 Center Lumber Co., Pittsburgh, Pa.
 Central City Lumber and Manufacturing Co., Central City, Ky.
 Central Panel and Supply Co., The, Cincinnati, Ohio.
 Certain Lumber Co., W. N., Neodesha, Kans.
 Chapin Lumber Co., The, Aurora, Colo.
 Chapin, Rollin G., Minneapolis, Minn. (In principle.)
 Charlottesville Lumber Co., Inc., Charlottesville, Va.
 Chesebro Whitman Co., Inc., Long Island City, N. Y.
 Chicago Trim and Plywood Co., Chicago, Ill.
 Child, Harry C., Sayre, Pa.
 Churchill Cabinet Co., Chicago, Ill.
 Clark County Lumber Co., The, Springfield, Ohio.
 Clark Veneer Co., Walter, Grand Rapids, Mich.
 Clear Fir Lumber Co., Tacoma, Wash.
 Cleveland Window Glass and Door Co., The, Cleveland, Ohio.
 Coit, E., New York, N. Y.
 Combs Lumber Co., Lexington, Ky.
 Conrad & Cummings, Binghamton, N. Y. (In principle.)
 Conrow, H. S., Wichita, Kans.
 Convertible Door Manufacturing Co., Milwaukee, Wis.
 Coolbaugh & Son Co., C. C., Gloucester City, N. J.
 Coolerator Corporation, The, Duluth, Minn.
 Cooper Lumber Co., W. E., Los Angeles, Calif.
 Cope, Thomas Pym, Philadelphia, Pa. (In principle.)
 Corddry Co., The, Snow Hill, Md.
 Corduan Manufacturing Co., Inc., Chicago, Ill.
 Cottonwood Lumber Co., Cottonwood, Ariz.
 Cram & Ferguson, Boston, Mass.
 Crompton & Knowles Loom Works, Worcester, Mass. (In principle.)
 Cumberland Sash and Door Co., Cumberland, Md.
 Curtis Companies, Inc., Clinton, Iowa.
 Curtis Door and Sash Co., Chicago, Ill.
 Daniel, J. E., Jr., Helena, Ark.
 Davidson Sash and Door Co., Inc., Lake Charles, La.
 Davis Co., T. S., Nashville, Tenn.
 Detroit Store Fixture Co., Detroit, Mich.
 Dix Lumber Co., Cambridge, Mass.
 Dodge & Morrison, New York, N. Y.
 Donovan, John J., Berkeley, Calif.
 Dover Lumber Co., Dover, N. J.
 Eggers Veneer Seating Co., F., Two Rivers, Wis.
 Elliott Bay Mill Co., Seattle, Wash.
 Emery's Sons, Inc., Thos., Cincinnati, Ohio.
 Empire, Ltd., The, Rockford, Ill.
 Empire Plywood Co., Inc., Brooklyn, N. Y.
 Enamel Products Co., The, Cleveland, Ohio.
 Evansville Sash and Door Co., Evansville, Ind.
 Fessenden Hall, Philadelphia, Pa.
 Fickling Lumber Co., A. E., Long Beach, Calif.
 Fleming, Bryant, Wyoming, N. Y.
 Forsblom, Ed, Wichita, Kans.
 Frey Planing Mill Co., The, Louisville, Ky.
 Fuller & Co., W. P., Boise, Idaho.
 Geissler, Charles C., Philadelphia, Pa.
 General Fireproofing Co., Youngstown, Ohio.
 General Millwork Corporation, Watervliet and Utica, N. Y.
 Georgia Show Case Co., Montgomery, Ala.
 Gibbs Lumber Co., Anaheim, Calif.
 Glover, W. E., Topeka, Kans.
 Golden Gate International Exposition, San Francisco, Calif.
 Gorrie Lumber Co., Montgomery, Ala.
 Government Street Lumber Co., Inc., Mobile, Ala.

- Grand Rapids Store Equipment Co., Grand Rapids, Mich.
- Granger & Bollenbacher, Chicago, Ill.
- Great Northern Lumber Co., Cashmere, Wash.
- Greenstein, Louis, Buffalo, N. Y.
- Grogan-Robinson Lumber Co., Great Falls, Mont.
- Hager & Cove Lumber Co., Lansing, Mich.
- Hagerstown Mantel and Furniture Co., Hagerstown, Md.
- Hall & Stromquist, Chicago, Ill.
- Hallack & Howard Lumber Co., The, Denver, Colo.
- Hallberg, L. G., Chicago, Ill.
- Hamilton, John A., New York, N. Y.
- Harbor Plywood Corporation, Hoquiam, Wash.
- Harper & West, Boston, Mass.
- Harrison Co., The W. H., Grand Island, Nebr.
- Hartung & Hansen, Inc., Seattle, Wash.
- Hays & Son, W. A., Blackwell, Okla.
- Heffelfinger Corporation, Louis, Hampton, Va.
- Heidritter Lumber Corporation, Elizabeth, N. J.
- Helfensteller Hirsch & Watson, St. Louis, Mo.
- Henrich Panel Co., Buffalo, N. Y.
- Hinckley Lumber Co., The Dwight, Cincinnati, Ohio.
- Hinckley & Son Co., John, Yarmouth-port and Hyannis, Mass.
- Hinkle Lumber Co., Paris, Tex.
- Hoffmann Lumber Co., Pittsburgh, Pa.
- Hoke, Karl Buckingham, Toledo, Ohio.
- Holsman & Holsman, Chicago, Ill.
- Hopkins, Albert Hart, Buffalo, N. Y.
- Hunt Sash and Door Co., S. M. B., Kansas City, Mo.
- Illinois, University of, Department of Architecture, Urbana, Ill. (In principle.)
- Illinois, University of, Physical Plant Department, Urbana, Ill. (In principle.)
- Interstate Lumber Co., The, Belpre, Ohio.
- Interstate Lumber Co., Missoula, Mont.
- Interstate Sash and Door Co., The, Cleveland, Ohio.
- Iowa Builders Supply Co., Cedar Rapids, Iowa.
- Jacoby & Everett, Allentown, Pa.
- Jamme, Bernard E., Summit, N. J.
- Joannes, Francis Y., New York, N. Y.
- Johnson, Kepler B., Seattle, Wash.
- Jones, Meredith, Seattle, Wash.
- Karpen & Bros., S., Huntington Park, Calif.
- Kellogg & Sons Co., Charles Co., Utica, N. Y.
- Kenosha Lumber and Coal Co., Kenosha, Wis.
- Killefer Manufacturing Corporation, Ltd., Los Angeles, Calif. (In principle.)
- King Lumber Co., The, Bakersfield, Calif.
- Kingsbury, Frederick, Needham, Mass.
- Knighton & Howell, Portland, Oreg.
- Koehl & Son, Inc., John W., Los Angeles, Calif.
- Kyle, Herbert S., & J. N. Arnold, Charleston, W. Va.
- Lake Washington Shipyards, Houghton, Wash.
- Lambert Lumber Co., Leavenworth, Kans.
- Lander Lumber Co., El Paso, Tex. (In principle.)
- Lane Mill Service, Arthur E., New York, N. Y.
- Lawrence, Holford & Allyn, Portland, Oreg.
- Levine, Ernest, Highland Park, N. J.
- Liver & Co., C. B., Omaha, Nebr. (In principle.)
- Lloyd & Son, Ltd., C., Wingham, Canada.
- Lockman, Frederick V., Seattle, Wash.
- Loeb, Laurence M., White Plains, N. Y.
- Loizeaux Lumber Co., J. D., Plainfield, N. J.
- Lovell-Scholfield Lumber Co., Eldora, Iowa.
- Lumber Dealers Supply Co., Denver, Colo.
- Lumbermen's Door and Trim Co., The, East Cleveland, Ohio.
- Lyman-Hawkins Lumber Co., The, Akron, Ohio.
- Lyon-Gray Lumber Co., Dallas, Tex.
- M & M Plywood Corporation, Division of M & M Woodworking Co., Longview, Wash.
- M & M Wood Working Co., Portland, Oreg.
- Macaulay Corporation, C. R., Brooklyn, N. Y.
- Marsh & Truman Lumber Co., Chicago, Ill.
- Martin & Son, A. Oscar, Doylestown, Pa.
- Mason & Co., George D., Detroit, Mich. (In principle.)
- Mason Lumber Co., Jacksonville, Fla.
- Mason & Sons, Inc., A., Peru, N. Y.
- Matot, D. A., Chicago, Ill.
- Mauk Lumber Co., The C. A., Toledo, Ohio.
- Mauran, Russell & Crowell, St. Louis, Mo.
- Maysville Lumber Co., Inc., Maysville, Ky.
- McCleary Timber Co., Henry, McCleary, Wash.
- McCray Refrigerator Co., Kendallville, Ind.
- McCrillis Co., Rolland P., Norwalk, Ohio.

- McLean Manufacturing Co., Pittsburgh, Pa.
 Melville Lumber Co., J. H., Monet Vista, Colo.
 Meyers, Henry H., Alameda, Calif.
 Midland Coal and Lumber Co., Miles City, Mont.
 Mid-West Lumber Co., Mankato, Kans.
 Miles Lumber and Coal Co., A. W., Livingston, Mont.
 Miller & Pfueger, San Francisco, Calif.
 Miller & Yeager, Terre Haute, Ind.
 Milligan Co., D., Jefferson, Iowa.
 Moeschl-Edwards Corrugating Co., Inc., The, Covington, Ky.
 Moline Furniture Works, Moline, Ill.
 Molther, F. R., Ancon, Canal Zone.
 Moore Dry Dock Co., Oakland, Calif.
 Moore-Handley Hardware Co., Birmingham, Ala.
 Moore & Williams, Jacksonville, Fla.
 Mooser, William, San Francisco, Calif.
 Morgan Millwork Co., Baltimore, Md.
 Morrison-Merrill & Co., Salt Lake City, Utah.
 Mueller, F. G., & W. R. Hair, Hamilton, Ohio.
 Mundie Jensen Bourke & Havens, Chicago, Ill.
 Myers, Nathan, Newark, N. J.
 Nash Motors Co., The Kenosha, Wis.
 Neal Blun Co., Savannah, Ga.
 Nelson, Albert L., St. Louis, Mo.
 New York Wood Working Corporation, New York, N. Y.
 Nicolai Door Sales Co., San Francisco, Calif.
 Northern Lumber Co., Billings, Mont.
 Northwest Door Co., Inc., Tacoma, Wash.
 Norton & Son, F. S., Algona, Iowa.
 Norwood-White Co., Hyde Park, Mass.
 Officer, Gwynn, Berkeley, Calif.
 Ohio Valley Lumber Co., Ambridge, Pa.
 Olympia Veneer Co., Inc., Olympia, Wash.
 Omaha Hardwood Lumber Co., Sioux City, Iowa.
 Oman, David S., Cincinnati, Ohio. (In principle.)
 Oregon-Washington Plywood Co., Tacoma, Wash.
 Ostlund & Johnson, San Francisco, Calif.
 Pacific Mutual Door Co., Tacoma, Wash.
 Pacific System Homes, Inc., Vernon, Calif.
 Pariseau Freres Limitee, Outremont, P. A., Canada.
 Parker, Llewellyn A., Los Angeles, Calif. (In principle.)
 Parmelee, M. E., Knoxville, Tenn.
 Patton Lumber Co., Ashland, Ky.
 Peaslee, Horace W., Washington, D. C.
 Peerless Built-In Fixture Co., Berkeley, Calif.
 Pehrson, G. A., Spokane, Wash.
 Pennsylvania, Commonwealth of, Harrisburg, Pa.
 People's Planing Mill, Punxsutawney, Pa.
 Philco Manufacturing Co., Philadelphia, Pa.
 Plachek, James W., Berkeley, Calif.
 Pleitsch & Price, St. Louis, Mo.
 Plylock Corporation, Division of M & M Wood Working Co., Portland, Ore.
 Purves, Edward R., Philadelphia, Pa.
 Queen City Sash and Door Co., The, Cincinnati, Ohio.
 Reid, William H., Jr., Billings, Mont.
 Richardson-Phelps Lumber Co., Grinnell, Iowa.
 Risser Lumber Co., Art., Paris, Ill.
 Robinson Manufacturing Co., Everett, Wash.
 Rockwell Bros. & Co., Houston, Tex.
 Rockwell Lumber Co., Houston, Tex.
 Roddis Co., Chicago, Ill.
 Roddis Lumber and Veneer Co., Kansas City, Mo.
 Rogers Lumber Co., The T. H., McAlester, Okla.
 Rounds & Porter Co., Wichita, Kans.
 Rourke, Henry L., Lowell, Mass.
 Roy Brothers, East Barnet, Vt. (In principle.)
 Ruse & Co., Baltimore, Md.
 Russ & Harrison, Indianapolis, Ind. (In principle.)
 Russell, Lance & Muri, Tacoma, Wash. (In principle.)
 Rutherford Lumber Co., Ltd., Montreal, P. Q., Canada.
 St. Louis, Board of Education, St. Louis, Mo.
 Sarvis, Lewis J., Battle Creek, Mich.
 Sash, Door, and Glass Corporation, Richmond, Va.
 Scamell, Ralph E., Topeka, Kans.
 Schiefer & Sons, San Diego, Calif.
 Schoeppe, Edward, Philadelphia, Pa.
 Schulzke, William H., Moline, Ill.
 Schwab & Palmgreen & Associates, Pittsburgh, Pa.
 Schweizer, Albert Chas., New York, N. Y.
 Scott Lumber Co., A. L., Topeka, Kans.
 Seaburg Manufacturing Co., Jamestown, N. Y.
 Searle & Chapin Lumber Co., Lincoln, Nebr.
 Segelke & Kohlhaus Co., La Crosse, Wis.
 Sherrill-Russell Lumber Co., Paducah, Ky.
 Shire, Edward I., New York, N. Y.
 Simons, Inc., Minneapolis, Minn.
 Simons Lumber Co., Henry, Minneapolis, Minn.
 Sirrinc & Co., J. E., Greenville, S. C.

- Smith & English, Hutchinson, Kans.
 Smith, Hinchman & Grylls, Inc.,
 Detroit, Mich.
 Smith & Sons, J. E., Philadelphia, Pa.
 Smith Wood-Products, Inc., Portland,
 Oreg.
 Sothman Co., The, Grand Island, Nebr.
 South Side Lumber and Supply Co.,
 The, Toledo, Ohio.
 Southern Box and Lumber Co., Wil-
 mington, N. C. (In principle.)
 Southern Door and Glass Co., Nash-
 ville, Tenn.
 Southwestern Sash and Door Co., Jop-
 lin, Mo.
 Sowers-Benbow Lumber Co., The, Co-
 lumbus, Ohio.
 Spahn & Rose Lumber Co., Dubuque,
 Iowa.
 Staats, H. P., Kent, Conn.
 Standard Lumber Co., Pine Bluff, Ark.
 Stanton & Son, Inc., E. J., Los Angeles,
 Calif.
 Stevenson Co., J. E., Trenton, N. J.
 Stewart Lumber Co., A. P., Thermopo-
 lis, Wyo.
 Stockton Lumber Co., Inc., Stockton,
 Calif.
 Stoetzel, Ralph E., Chicago, Ill.
 Strable Hardwood Co., Oakland, Calif.
 Strong & Hale Lumber Co., The, Port-
 land, Conn.
 Swan Lake Moulding Co., Klamath
 Falls, Oreg.
 Sweets Catalog Service, New York,
 N. Y.
 Teachout Co., The, Cleveland, Ohio.
 Teachout Sash, Door and Glass Co.,
 The, Detroit, Mich.
 Temple, Seth J., Davenport, Iowa.
 Texas Technological College, Lubbock,
 Tex. (In principle.)
 Thorne, Henry Calder, Ithaca, N. Y.
 Tomlinson, Henry W., Joliet, Ill.
 Toombs-Fay Co., Springfield, Mo.
 Twin City Hardwood Lumber Co., St.
 Paul, Minn.
 Tyre, Philip Scott, Philadelphia, Pa.
 Unger, William, Bucyrus, Ohio.
 United States Plywood Co., Inc., Los
 Angeles, Calif.
 United States Plywood Corporation,
 Inc., New York, N. Y.
 Van Bergen, John S., Ravinia, Ill.
 Van Pelt, John V., Patchogue, N. Y.
 Van Winkle Bromley Lumber Co., Pat-
 erson, N. J.
 Vancouver Plywood and Veneer Co.,
 Vancouver, Wash.
 Vickere Lumber Co., T. W., Sheridan,
 Wyo.
 Virginia Polytechnic Institute, Blacks-
 burg, Va.
- Von Tobel Lumber Co., Ed, Las Vegas*
 Nev.
 Wachter, Harry W., and Horace W.
 Wachter, Toledo, Ohio.
 Wanke Panel Co., Portland, Oreg.
 Waples-Painter Co., Gainesville, Tex.
 Ward-Brock Sash and Door Co., The,
 Cincinnati, Ohio.
 Washburn, Williams & Co., Scranton,
 Pa.
 Washington Veneer Co., Olympia, Wash.
 Waterville Lumber and Coal Co., Wa-
 terville, Kans.
 Weinberg, Jos. L., Cleveland, Ohio.
 West Coast Plywood Co., Aberdeen,
 Wash.
 West Side Lumber Co., Atlantic City,
 N. J.
 Western Door and Sash Co., Oakland,
 Calif.
 Western Hardwood Lumber Co., Los
 Angeles, Calif.
 Weston Basket and Barrel Plant of Pa-
 cific States Box and Basket Co., San
 Francisco, Calif.
 Wheeler Osgood Sales Corporation, Ta-
 coma, Wash.
 Whissel Lumber Co., Inc., L. N., Buf-
 falo, N. Y.
 White Bros., San Francisco, Calif.
 Whitmer-Jackson Co., The, Cleveland,
 Ohio.
 Whittier Lumber and Millwork Co.,
 Newark, N. J.
 Wight & Wight, Kansas City, Mo.
 Wilbur Lumber Co., Waukesha, Wis.
 Wilbur Lumber Co., West Allis, Wis.
 Wischmeyer, Wm. F., St. Louis, Mo.
 Wisconsin Veneer Co., Rhinelander,
 Wis.
 Wood Glass Co., Syracuse, N. Y.
 Wood Lumber Co., E. K., Los Angeles,
 Calif.
 Wood & Son, Associates, Edward J.,
 Clarksburg, W. Va.
 Woodcraft Corporation, The, Bay City,
 Mich.
 Wright-Rogvov, Detroit, Mich. (In
 principle.)
 Zoller & Muller, New York, N. Y.

U. S. GOVERNMENT

- District of Columbia, Government of
 the, Washington, D. C.
 Federal Housing Administration, Wash-
 ington, D. C. (In principle.)
 Federal Trade Commission, Washing-
 ton, D. C.
 Treasury Department, U. S., Washing-
 ton, D. C.
 Veterans Administration, Washington,
 D. C.
 War Department, Washington, D. C.

COMMERCIAL STANDARDS

CS no.	Item	CS no.	Item
0-30.	The commercial standards service and its value to business.	34-31.	Bag, case, and strap leather.
1-32.	Clinical thermometers (second edition).	35-31.	Plywood (hardwood and eastern red cedar).
2-30.	Mopsticks.	36-33.	Fourdrinier wire cloth (second edition).
3-28.	Stoddard solvent.	37-31.	Steel bone plates and screws.
4-29.	Staple porcelain (all-clay) plumbing fixtures.	38-32.	Hospital rubber sheeting.
5-29.	Steel pipe nipples.	39-32.	Wool and part wool blankets.
6-31.	Wrought-iron pipe nipples (second edition).	40-32.	Surgeons' rubber gloves.
7-29.	Standard weight malleable iron or steel screwed unions.	41-32.	Surgeons' latex gloves.
8-33.	Gage blanks (second edition).	42-35.	Fiber insulating board (second edition).
9-35.	Builders' template hardware (second edition).	43-32.	Grading of sulphonated oils.
10-29.	Brass pipe nipples.	44-32.	Apple wraps.
11-29.	Regain of mercerized cotton yarns.	45-36.	Douglas fir plywood (domestic grades) (second edition).
12-35.	Fuel oils (third edition).	45E-36.	Douglas fir plywood (export grades).
13-30.	Dress patterns.	46-36.	Hosiery lengths and sizes (second edition).
14-31.	Boys' blouses, button-on waists, shirts, and junior shirts.	47-34.	Marking of gold-filled and rolled-gold-plate articles other than watchcases.
15-29.	Men's pajamas.	48-34.	Domestic burners for Pennsylvania anthracite (underfeed type).
16-29.	Wallpaper.	49-34.	Chip board, laminated chip board, and miscellaneous boards for bookbinding purposes.
17-32.	Diamond core drill fittings (second edition).	50-34.	Binders board for bookbinding and other purposes.
18-29.	Hickory golf shafts.	51-35.	Marking articles made of silver in combination with gold.
19-32.	Foundry patterns of wood (second edition).	52-35.	Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).
20-36.	Staple vitreous china plumbing fixtures (second edition).	53-35.	Colors and finishes for cast stone.
21-36.	Interchangeable ground-glass joints, stopcocks, and stoppers (third edition).	54-35.	Mattresses for hospitals.
22-30.	Builders' hardware (nontemplate).	55-35.	Mattresses for institutions.
23-30.	Feldspar.	56-36.	Oak flooring.
24-30.	Standard screw threads.	57-36.	Book cloths, buckrams, and impregnated fabrics for bookbinding purposes, except library bindings.
25-30.	Special screw threads.	58-36.	Woven elastic fabrics for use in overalls (overall elastic webbing).
26-30.	Aromatic red-cedar closet lining.	59-36.	Woven dress fabrics—testing and reporting.
27-36.	Mirrors (second edition).	60-36.	Hardwood dimension lumber.
28-32.	Cotton fabric tents, tarpaulins, and covers.		
29-31.	Staple seats for water-closet bowls.		
30-31.	Colors for sanitary ware.		
31-35.	Wood shingles (third edition).		
32-31.	Cotton cloth for rubber and pyroxylin coating.		
33-32.	Knit underwear (exclusive of rayon).		

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

CS45E-36
Plywood, Douglas Fir (Export Grades)

U. S. DEPARTMENT OF COMMERCE
DANIEL C. ROPER, Secretary
NATIONAL BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

DOUGLAS FIR PLYWOOD
(EXPORT GRADES)

COMMERCIAL STANDARD CS45E-36

Effective Date for New Production November 1, 1936



A RECORDED STANDARD OF THE INDUSTRY

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1936

PROMULGATION
of
COMMERCIAL STANDARD CS45E-36
for
DOUGLAS FIR PLYWOOD
(EXPORT GRADES)

On September 9, 1936, at the request of the Douglas Fir Plywood Association and with the approval of the standing committee, a recommended revision of Douglas Fir Plywood, Commercial Standard CS45-33, incorporating changes applicable to export grades, was submitted to the manufacturers and distributors for approval. The industry has since accepted and approved for promulgation by the United States Department of Commerce, through the National Bureau of Standards, the standard as shown herein.

The standard is effective for new production beginning November 1, 1936.

Promulgation recommended.

I. J. Fairchild,
Chief, Division of Trade Standards.

Promulgated.

Lyman J. Briggs,
Director, National Bureau of Standards.

Promulgation approved.

Daniel C. Roper,
Secretary of Commerce.

DOUGLAS FIR PLYWOOD

(EXPORT GRADES)

COMMERCIAL STANDARD CS45E-36

DEFINITION

1. Douglas fir plywood is a built up board of laminated veneers in which the grain of each piece is at right angles to the one adjacent to it. The kiln dried veneer is united under high pressure with a water-resistant glue, making the joints as strong or stronger than the wood itself. The alternating direction of the grain with each contiguous layer of wood equalizes the strains and in this way minimizes shrinkage and warping of the product and prevents splitting.

GENERAL REQUIREMENTS

2. All Douglas fir plywood sold as of commercial standard quality shall meet the following general requirements:

3. *Workmanship.*—It shall be smoothly sanded on two sides unless otherwise specified. It shall be well manufactured and free from blisters, laps, etc., except as permitted in the specific rules for the various grades.

4. *Construction.*—Unless otherwise specified, veneers $\frac{1}{2}$ inch or more shall be used in the construction of panels $\frac{1}{4}$ inch and upward in thickness. The veneer thickness shall be measured before the panel is sanded.

5. *Gluing.*—It shall be tightly glued with water-resistant glue.

DETAIL REQUIREMENTS

6. *The grade descriptions set forth the minimum requirements, and therefore the average quality of the panels in any shipment will exceed the specification given. Douglas fir plywood shall be graded according to both sides of the piece into the following standard grades:*

"AA" GRADE

7. Each face shall be of a single piece of smoothly cut veneer of 100-percent heartwood, free from knots, splits, checks, pitch pockets, and other open defects. No blue stain will be permitted. Shims that occur only at the ends of the panels and a few inconspicuous well-matched small patches not to exceed $\frac{3}{8}$ inch wide by $2\frac{1}{2}$ inches long shall be admitted. This grade is recommended for uses where a light stain or natural finish is desired.

"A" GRADE

8. One face shall be equal to the description for "AA" grade, while the reverse face shall be sound and of one piece. No joints are permitted in either face.

"B" GRADE

9. This grade must present a sound surface on both sides, but may show any amount of discoloration. One face may be made up of two or more pieces well joined and reasonably matched for grain and color at the joints. All open defects must be neatly repaired and both faces must present a surface suitable for painting. Open defects not permitted in faces.

"AA/BB" GRADE

10. One face shall be equal to the description for "AA" grade, while the reverse face shall admit solid or open defects in number and size which will not seriously affect the strength or serviceability of the panel for purposes where but one face is exposed.

"B/BB" GRADE

11. One face to be equal to the description for "B" grade but may be made up of two or more pieces well joined and reasonably matched for grain and color at the joints. The reverse face shall admit solid or open defects in number and size which will not seriously affect the strength or serviceability of the panel for purposes where but one face is exposed.

NO. 1 DOOR PANELS

12. The grade of no. 1 door panels shall be the same as for "AA" grade.

NO. 2 DOOR PANELS

13. Each face shall be of a single piece of veneer that is free of knots and other open defects, but may admit medium stain and discoloration. Patches not to exceed $\frac{5}{8}$ by $2\frac{1}{2}$ inches and shims of any size when reasonably selected for color and grain, are admissible.

CONCRETE FORM PLYWOOD

14. Concrete form plywood shall be built up of three or five thicknesses of veneer, of which the two outside plies are at least $\frac{1}{8}$ inch thick before sanding. An occasional knot hole is permissible in the center core of 5-ply panels only but no knot holes are permitted in the cross banding.

15. Faces must be free from knots or open defects. The glue used shall be especially prepared for this purpose and be very highly water-resistant. When so ordered, concrete form plywood will be treated with a satisfactory form oil or other preparation, prior to shipment. All concrete form plywood shall be branded.

SIZE TOLERANCES

16. A tolerance of $\frac{1}{64}$ (0.0156) inch over or under the specified thickness shall be allowed on sanded panels and a tolerance of $\frac{1}{32}$ (0.0312) inch on unsanded panels.

17. A tolerance of $\frac{1}{32}$ (0.0312) inch over or under the specified length and/or width shall be allowed but all panels shall be square within $\frac{1}{8}$ (0.1250) inch.

INSPECTION

18. All plywood guaranteed to conform to the commercial standard grading rules is sold subject to inspection in the white only, except concrete form material which may have a priming of oil or other preparation before shipment.

CERTIFICATION

Recognizing the necessity of maintaining high standards of quality, the Douglas Fir Plywood Association has established an inspection bureau for the careful grading of all plywood entering the export trade. Each shipment is accompanied by a certificate of inspection, facsimile of which appears below, on which the quantity of each grade is attested to over a sworn statement by a licensed inspector.

CERTIFICATE OF INSPECTION

DOUGLAS FIR PLYWOOD ASSOCIATION
INSPECTION BUREAU
TACOMA BUILDING
TACOMA, WASH. U. S. A.

WE
inspector licensed by the Douglas Fir Plywood Association and at the time acting in that capacity,
do hereby certify that WE have personally verified and inspected the parcel enumerated below.
WE have found this parcel to be in good order and condition, up to grade specified and containing
the quantity as given in the body of this certificate.

regularly approved

INSPECTOR

Subscribed and declared to before me, the undersigned, a Notary Public in and for the State of _____
residing at _____
by the above named part _____ personally known to me as the
person _____ signing the above certificate.

Date _____

NOTARY PUBLIC

COVENANTERS _____
INSPECTOR GENERAL

GLOSSARY OF TERMS

Centers.—See *Cores*.

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

Cores.—Cores or centers are the innermost layer in plywood construction.

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 cores and faces.

Defects, open.—Checks, splits, open joints, cracks, loose knots, and other defects interrupting the smooth continuity of the panel surface.

Heartwood.—Sometimes referred to as "heart"—the darker-colored wood occurring in the inner portion of the tree.

Inspection in the white.—This means inspection before panels are finished, such as with varnish, stain, paint, or enamel.

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

Knot holes.—Voids produced by the dropping of knots from the wood in which they were originally embedded.

Lap.—A condition where the veneers used are so misplaced that one piece overlaps the other rather than making a smooth butt joint.

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

Pitch pockets.—A pitch pocket is a well-defined opening between rings of annual growth, usually containing, or which has contained, more or less pitch, either solid or liquid.

Pitch streaks.—A pitch streak is a well-defined accumulation of pitch in a more or less regular streak.

Sapwood.—Sometimes referred to as "sap"—the lighter-colored wood occurring in the outer portion of the tree.

Shim.—A long, narrow patch not more than $\frac{3}{16}$ inch wide.

Sound surface.—A sound surface means that all open defects have been patched.

EFFECTIVE DATE

The standard became effective for new production on November 1, 1936.

STANDING COMMITTEE

The following comprises the membership of the standing committee, which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Each association nominated its own representatives. Comment concerning the standard and suggestions for revision, may be addressed to any member of the committee or to the Division of Trade Standards, National Bureau of Standards, which acts as secretary for the committee.

RALPH BRINDLEY (chairman), The Wheeler Osgood Co., Tacoma, Wash.

BRUCE CLARK, Elliott Bay Mill Co., 600 West Spokane Street, Seattle, Wash.

M. SEKSTROM, Olympia Veneer Co., Inc., Olympia, Wash.

PHILIP GARLAND, Oregon-Washington Plywood Co., 1549 Dock Street, Tacoma, Wash.

H. C. RELF, Pacific Forest Industries, Tacoma Building, Tacoma, Wash.

HISTORY OF PROJECT

Pursuant to a request from the manufacturers of Douglas fir plywood a general conference of manufacturers, distributors and users of the product was held at the Winthrop Hotel, Tacoma, Wash., on August 17, 1932, to consider the adoption of standard grading rules for the guidance of the industry.

Manufacturers representing approximately 80 percent of the production of Douglas fir plywood were in attendance as well as others interested in the distribution and use of the product.

The proposed standard that had been tentatively drafted by a committee of manufacturers was thoroughly discussed and several constructive changes were made.

The general opinion of the conference was decidedly favorable to the adoption of definite grades for the manufacture, sale, and use of Douglas fir plywood and it was unanimously voted:

To approve for recommendation to the entire industry the Commercial Standard for Douglas Fir Plywood with the adjustments as made by the conference.

FIRST REVISION

The standing committee as a result of an industry conference held in Tacoma, Wash., on August 3, 1936, recommended the modifications embraced in the present edition and further urged their publication as a separate document from that covering domestic grades.

The recommended revision was circulated on September 9, 1936 for written acceptance with the result that the revised standard was accepted and authorized by the industry for publication as Douglas Fir Plywood (Export Grades), Commercial Standard CS45E-36.

CS45E-36

ACCEPTANCE OF COMMERCIAL STANDARD

This sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date.....

Division of Trade Standards,
National Bureau of Standards,
Washington, D. C.

Gentlemen:

Having considered the statements on the reverse side of this sheet, we accept the Commercial Standard CS45E-36 as our standard of practice in the

Production ¹

Distribution ¹

Use ¹

of Douglas fir plywood (export grades).

We will assist in securing its general recognition and use, and will cooperate with the standing committee to effect revisions of the standard when necessary.

Signature.....

(Kindly typewrite or print the following lines)

Title.....

Company.....

Street address.....

City and State.....

¹ 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.

(Cut on this line)

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial standards are commodity specifications voluntarily established by mutual consent of the industry. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the industry as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish for specific commodities, nationally recognized grades or consumer criteria and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function performed by the Department of Commerce in the voluntary establishment of commercial standards on a Nation-wide basis is fourfold: First, to act as an unbiased coordinator to bring all branches of the industry together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by companies representing a satisfactory majority of production, the success of the project is announced. If, however, in the opinion of the standing committee of the industry or the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

The organizations listed below have accepted these grade descriptions as their standard of practice in the production and distribution of Douglas fir plywood for the export trade. Appearance on this list does not in itself constitute a guarantee that all of their products meet the Commercial Standard and therefore further evidence of quality certification should be obtained with each shipment.

ASSOCIATIONS

Douglas Fir Plywood Association, Tacoma, Wash. (In principle.)
Pacific Forest Industries, Tacoma, Wash.

FIRMS

Aberdeen Plywood Co., Aberdeen, Wash.
Aircraft Plywood Corporation, Seattle, Wash.
Buffelen Lumber and Manufacturing Co., Tacoma, Wash.
Capitol Plywood Co., Olympia, Wash.
Elliott Bay Mill Co., Seattle, Wash.
Harbor Plywood Corporation, Hoquiam, Wash.
M & M Plywood Corporation, Division of M & M Wood Working Co., Longview, Wash.
M & M Wood Working Co., Portland, Oreg.

FIRMS—continued

McCleary Timber Co., Henry, McCleary, Wash.
Northwest Door Co., Tacoma, Wash.
Olympia Veneer Co., Inc., Olympia, Wash.
Oregon-Washington Plywood Co., Tacoma, Wash.
Plylock Corporation, Division of M & M Wood Working Co., Portland, Oreg.
Robinson Manufacturing Co., Everett, Wash.
Smith Wood-Products, Inc., Portland, Oreg.
Vancouver Plywood & Veneer Co., Vancouver, Wash.
Washington Veneer Co., Olympia, Wash.
West Coast Plywood Co., Aberdeen, Wash.
Wheeler Osgood Sales Corporation, Tacoma, Wash.

COMMERCIAL STANDARDS

OS no.	Item	OS no.	Item
0-30.	The commercial standards service and its value to business.	34-31.	Bag, case, and strap leather.
1-32.	Clinical thermometers (second edition).	35-31.	Plywood.
2-30.	Mopsticks.	36-33.	Fourdrinier wire cloth (second edition).
3-28.	Stoddard solvent.	37-31.	Steel bone plates and screws.
4-29.	Staple porcelain (all-clay) plumbing fixtures.	38-32.	Hospital rubber sheeting.
5-29.	Steel pipe nipples.	39-32.	Wool and part wool blankets.
6-31.	Wrought-iron pipe nipples (second edition).	40-32.	Surgeons' rubber gloves.
7-29.	Standard weight malleable iron or steel screwed unions.	41-32.	Surgeons' latex gloves.
8-33.	Gage blanks (second edition).	42-35.	Fiber insulating board (second edition).
9-33.	Builders' template hardware (second edition).	43-32.	Grading of sulphonated oils.
10-29.	Brass pipe nipples.	44-32.	Apple wraps.
11-29.	Regain of mercerized cotton yarns.	45-36.	Douglas fir plywood (domestic grades) (second edition).
12-35.	Fuel oils (third edition).	45E-36.	Douglas fir plywood (export grades).
13-30.	Dress patterns.	46-36.	Hosiery lengths and sizes (second edition).
14-31.	Boys' blouses, button-on waists, shirts, and junior shirts.	47-34.	Marking of gold-filled and rolled-gold-plate articles other than watch cases.
15-29.	Men's pajamas.	48-34.	Domestic burners for Pennsylvania anthracite (underfeed type).
16-29.	Wall paper.	49-34.	Chip board, laminated chip board, and miscellaneous boards for bookbinding purposes.
17-32.	Diamond core drill fittings (second edition).	50-34.	Binders board for bookbinding and other purposes.
18-29.	Hickory golf shafts.	51-35.	Marking articles made of silver in combination with gold.
19-32.	Foundry patterns of wood (second edition).	52-35.	Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).
20-36.	Staple vitreous china plumbing fixtures (second edition).	53-35.	Colors and finishes for cast stone.
21-36.	Interchangeable ground-glass joints, stop-cocks, and stoppers (third edition).	54-35.	Mattresses for hospitals.
22-30.	Builders' hardware (nontemplate).	55-35.	Mattresses for institutions.
23-30.	Feldspar.	56-36.	Oak flooring.
24-30.	Standard screw threads.	57-36.	Book cloths, buckrams, and impregnated fabrics for bookbinding purposes except library bindings.
25-30.	Special screw threads.	58-36.	Woven elastic fabrics for use in overalls (overall elastic webbing).
26-30.	Aromatic-red-cedar closet lining.	59-36.	Woven dress fabrics—testing and reporting.
27-36.	Mirrors (second edition).	60-36.	Hardwood dimension lumber.
28-32.	Cotton fabric tents, tarpaulins, and covers.		
29-31.	Staple seats for water-closet bowls.		
30-31.	Colors for sanitary ware.		
31-35.	Wood shingles (third edition).		
32-31.	Cotton cloth for rubber and pyroxylin coating.		
33-32.	Knit underwear (exclusive of rayon).		

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