

SERIAL

TECHNICAL NOTE NUMBER 260

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

FOREST PRODUCTS LABORATORY

MADISON 5, WISCONSIN

July 1956

ESTIMATING THE WEIGHT OF PLYWOOD

It is often necessary to estimate the weight of plywood to be used, either in the design of a wooden fixture or structures, or for shipping purposes. Tables of plywood panel weights are difficult to set up because of the possible variations in panel constructions, in veneer thicknesses, and in species, and because of the varying number of glue lines that may be present. The weight of plywood panels, however, can readily be estimated by summing up the weights of the various plies of wood, the glue, and the water in the wood.

The weights of several thicknesses of veneers of various species are given in table 1, in pounds per 1,000 square feet of surface. These weights were calculated on the assumption that the moisture content of the wood was 8 percent. Weight adjustments can be made if the moisture content is not reasonably near 8 percent, but this refinement is not necessary for most purposes.

The dry weight of the glue added in making plywood may vary from about 15 to 30 pounds per 1,000 square feet of single glue line, but an average value of 25 pounds may be assumed here. In 3-ply panels with 2 glue lines, the weight to be used in the calculation is therefore 50 pounds, while in 5-ply panels it is 100 pounds, and so forth.

For thicknesses of veneer or lumber cores not shown in table 1, proportionate values can be calculated by using the figure for 1/10-inch veneer as a basis weight. For example, a lumber core with a thickness of 13/16 inch, or 0.813 inch, would have a weight 8.13 times that of 1/10-inch veneer of the same species.

The following are some sample calculations of plywood panel weights as calculated from veneer weights given in table 1.

1. Determine the weight of 1,000 square feet of 1/4-inch Douglas-fir plywood:

Weight of wood: $2 \times 345 =$	690 lb.
Weight of glue: $2 \times 25 =$	50
Total	<u>740 lb.</u>

2. Determine the weight of 1,000 square feet of sanded 1/4-inch, 3-ply plywood with a 3/16-inch core of yellow-poplar and face and back of Khaya (African mahogany) veneer:

Weight of yellow-poplar:	456 lb.
Weight of Khaya: $1/2 \times 320 =$	160
Weight of glue: $2 \times 25 =$	50
Total	<u>666 lb.</u>

3. Determine the weight of 1,000 square feet of sanded 1-inch, 5-ply lumber core paneling, with a 13/16-inch (0.813-inch) yellow-poplar core, 2 crossbands of 1/20-inch basswood veneer, a 1/24-inch face of walnut veneer, and a 1/24-inch back of sweetgum veneer:

Weight of lumber core: $8.13 \times 243 =$	1,976 lb.
Weight of crossbands:	212
Weight of face veneer: $1/3 \times 385 =$	128
Weight of back veneer: $1/3 \times 370 =$	123
Weight of glue: $4 \times 25 =$	100
Total	<u>2,539 lb.</u>

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Table 1. -- Weight of 1,000 square feet of veneer, based on
weight and volume at a moisture content of 8
percent

Species ¹	Thickness of veneer			
	1/32-	1/10-	1/8-	3/16-
	inch	inch	inch	inch
	Lb.	Lb.	Lb.	Lb.
HARDWOODS				
Ash, black	89	286	357	536
Ash, white	108	346	432	648
Basswood, American	66	212	266	398
Beech, American	112	360	450	675
Birch, sweet	120	383	479	719
Birch, yellow	110	353	442	662
Butternut	69	220	275	412
Cherry, black	91	290	362	544
Cottonwood, black	62	198	248	372
Cottonwood, eastern	73	233	292	437
Elm, American	92	296	370	555
Elm, rock	111	356	445	667
Hackberry	94	302	377	566
Hickory, pecan	117	375	469	703
Hickory, pignut	137	438	548	822
Hickory, shagbark	131	419	524	786
Khaya, (African Mahogany) ²	80	256	320	480
Magnolia, southern	90	287	358	537
Mahogany, Central American ³	87	277	347	520
Maple, black	104	332	415	622
Maple, red	93	297	371	556
Maple, silver	85	273	348	512
Maple, sugar	113	362	452	678
Oak, northern red	111	354	443	664
Oak, white	119	380	475	712
Sweetgum	92	296	370	555
Sycamore	90	289	361	542

Table 1. -- Weight of 1,000 square feet of veneer, based on weight and volume at a moisture content of 8 percent (Continued)

Species ¹	Thickness of veneer			
	1/32- inch	1/10- inch	1/8- inch	3/16- inch
	Lb.	Lb.	Lb.	Lb.
Tupelo, black	92	296	370	555
Tupelo, water	88	283	354	531
Walnut, black	96	308	385	578
Willow, black	70	224	280	420
Yellow-poplar	76	243	304	456

SOFTWOODS

Douglas-fir (coast type)	86	276	345	517
Fir, noble	68	218	273	409
Fir, pacific silver	71	227	284	427
Hemlock, western	75	239	299	448
Larch, western	99	318	379	597
Pine, ponderosa	72	229	286	430
Pine, sugar	65	207	259	389
Pine, western white	71	226	282	423
Redcedar, western	58	187	233	350
Redwood	71	228	285	428
Spruce, Sitka	71	226	282	423

¹Weight data are from the Wood Handbook, Agriculture Handbook No. 72, Washington, D. C., 1955 (table 7), except as indicated.

²Based on ANC Bulletin No. 19.

³Based on samples from Nicaragua, British Honduras, and Cuba.