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VENEER RECOVERY FROM PEELER-GRADE DOUGLAS-FIR LOGS IN WESTERN WASHINGTON

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As Douglas-fir plywood production continues to expand, increased demands will be made for all grades of peelable Douglas-fir logs. Thus, it becomes increasingly important to know the veneer-grade recovery expected so that timber and logs can be more accurately appraised.

In 1956 the Pacific Northwest Forest and Range Experiment Station made two veneer-recovery studies[1/] in western Washington; one in July at Simpson Logging Company, Shelton, and the other in October at Columbia Veneer Company, Kalama. A combined volume of 282,480 board-feet of Douglas-fir logs was selected and graded as follows:

Log grade	Net volume (Board-feet)
No. 1 Peeler	91,850
No. 2 Peeler	84,700
No. 3 Peeler	77,780
Special Peeler[2/]	28,150
Total	282,480

1/ Cooperating agencies were: Bureau of Land Management, Bureau of Indian Affairs, Douglas Fir Plywood Association, Puget Sound and Columbia River log scaling and grading bureaus.

2/ Small No. 2 Sawmill logs (18 through 23 inches) meeting requirements of at least No. 3 Peelers except for size.

PROCEDURE

These logs were scaled and graded in the water by representatives of the log scaling and grading bureau employed at the mill, with a Forest Service check scaler collaborating. They were graded according to the official rules jointly adopted by the Puget Sound, Grays Harbor, Southern Oregon, and Northern California log scaling and grading bureaus. Logs of like grade were segregated into test runs of approximately 4 hours' peeling time at the lathe. However, for two test runs in one of the studies, the sample was increased to represent approximately 6 hours' peeling time.

After the logs were bucked into 8-1/2-foot blocks for the lathe, they were peeled into 1/8- or 1/10-inch veneer as desired by mill management. At the Columbia Veneer Company plant and at the McCleary, Wash., plant of Simpson Logging Company, where core lathes are available, the peelable cores from the large lathe were rerun into 3/16-inch veneer. These cores were peeled to approximately a 6-inch diameter. At Simpson's Shelton plant, the blocks were peeled to about an 8-inch diameter.

The veneer was dried in conventional steam-heated driers immediately after cutting and was graded under the direction of a Douglas Fir Plywood Association grade supervisor. Grading was done in accordance with Commercial Standard CS 45-55 for Douglas-fir plywood, with the following modifications: Full-width sheets (48 by 96 inches) of A-face admitted 8 patches or plugs acceptable in the grade and B-face admitted 12. Narrower sheets admitted a proportional amount of repairing. The volume of veneer was measured after drying and expressed in terms of equivalent 3/8-inch rough-trimmed panel. Correction for veneer grade fall-down at the patchers and pluggers was applied to the appropriate volume tally.

To compute net volume of veneer recovered in each grade, the volume discarded at the glue spreaders and the volumes removed in jointing, dry clipping, and trimming to panel size were deducted from the appropriate gross volume. Correction for grade reduction of veneer in the panel finishing operation was made by transferring 5 percent of the A veneer to B and 5 percent of the B veneer to C.[3/]

3/ Estimates obtained from several plywood plant superintendents.

DISCUSSION

Industry measures the production of plywood in terms of square feet of 3/8-inch rough panel (before sanding). Recovery ratios express the amount of panel volume square feet of 3/8-inch rough panel obtained per board-foot of logs peeled (net scale). The average recovery ratios for each of the four log grades covered in these studies are shown in table 1. The range of these recovery ratios is above the industry-average recovery ratio of 2.3.

In these studies it was not feasible to determine separately every source of veneer processing loss. This is due, in part, to variation between plants in equipment and techniques employed. The amount of veneer repairing also varies and contributes to some volume and grade changes. Rejected panels and dry clip developed during lay-up are other sources of minor losses not identified in this study.

Volume loss is often incurred in veneer production because logs available to the mill are different lengths and some are not fully utilized when bucked into peeler blocks. There was no such loss in these studies since test logs were selected only in 17-, 26-, 34-, and 42-foot lengths.

The smaller peeler logs show a higher recovery ratio than larger logs of the same grade (table 1). This may be due in part to an oddity of the Scribner log rule. In comparison with the International 1/4-inch log rule, which is considered to be the most accurate rule of those in common use, the Scribner rule underscales logs 32 through 36 inches in diameter considerably more than logs immediately above and below that range (over 36 inches and 25-31 inches). The largest underscale for peeler size logs is for those 34 inches in diameter. If, then, the smaller logs are scaled into the mill at a volume less than they actually contain, it will tend to increase recovery ratios for logs of these sizes and thereby influence the average recovery ratio for the grade.

For comparison with industry's average panel recovery, it is necessary to adjust table 1 to allow for all volume loss not measured during the study. For the 12-month period ending August 1956 the reported industry-average recovery ratio was approximately 2.3. Converting the percentage values of table 1 to a 2.3 ratio gives the veneer-grade yield shown in table 2. The procedure for reducing table 1 to a 2.3 ratio is illustrated as follows: table 1 shows that 34

Table 1.--Recovery of dry Douglas-fir veneer from peelable logs in western Washington[1/]

Log grade and diameter (Inches)	Net log scale	Log scaling deductions[2/]	Dry veneer recovered (3/8-inch equivalent)	Veneer recovery (Percentage of net log scale) A	B	C	D	Recovery ratio[3/]
	Bd.-ft.	Percent	Sq. ft.	----Percent----				
No. 1 Peeler:								
30-36	38,450	4.7	111,070	32	13	37	26	2.89
Over 36	53,400	11.5	136,730	36	13	25	22	2.56
Total or Wtd. Av.	91,850	8.7	247,800	34	13	30	24	2.70
No. 2 Peeler:								
30-36	34,350	10.6	89,980	31	15	33	19	2.62
Over 36	50,350	11.8	119,660	21	12	28	28	2.38
Total or Wtd. Av.	84,700	11.3	209,640	25	13	30	25	2.47
No. 3 Peeler:								
24-29	37,320	5.7	106,390	18	16	43	30	2.85
Over 29	40,460	10.7	95,960	15	10	23	41	2.37
Total or Wtd. Av.	77,780	8.3	202,350	16	12	33	36	2.60
Special Peeler:								
18-23	28,150	5.3	74,340	9	11	46	33	2.64

1/ Based on studies at Simpson Logging Co. and Columbia Veneer Co. in 1956.

2/ Determined as follows: $\frac{\text{Gross scale - Net scale}}{\text{Gross scale}} \times 100.$

3/ Volume of veneer (3/8-inch basis) divided by net log scale.

percent of the No. 1 Peeler net log scale is A-grade veneer; thus, 34 X 2.3 divided by 2.70 equals 28.9 percent or 29 percent as shown in table 2. Other veneer items were adjusted in a similar manner.

Table 2.--Adjusted recovery of dry Douglas-fir veneer from peelable logs in western Washington[1/]

Log grade	Veneer recovery (Percentage of net log scale)			
	A	B	C	D
	Percent			
No. 1 Peeler	29	11	26	20
No. 2 Peeler	23	12	28	23
No. 3 Peeler	14	11	29	32
Special Peeler	8	10	40	28

1/ Veneer recovery figures in Table 1 adjusted to the industry-average recovery ratio of 2.3.

Some of the industry is patching veneer in excess of the 8- and 12-patch limit established respectively for A- and B-grade veneer in the design of these studies. Consequently, they may develop more A- or B-grade veneer than is shown here.