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Chapter 5. Veneer and Plywood

Measurement

Standard Reporting Basis

Square Foot 3/8 Inch Basis ($SF_{3/8}$). In North America, statistics on veneer, plywood, and other panel products (Chapter 6) are generally reported as the number of square feet, or surface measure, of a stated thickness. Due to the variety of thicknesses available, surface measures are not directly comparable. Hence to facilitate accounting and reporting, statistics are commonly expressed on a standardized thickness basis. For veneer and plywood, this standard thickness basis is 3/8 inch. Plywood and veneer volumes are usually measured dry (2 to 5% MC_{od}).

For other panel products, covered in Chapter 6, the standard thickness basis may be 1/8, 3/8, 1/2, or 3/4 inch depending on the category of panel. Table 5-1 lists a number of common panel thicknesses and factors to convert them to one of the four standard thickness bases.

Square Meter, 1 mm Basis. The standard basis for reporting plywood and veneer in countries on the metric system is the square meter, 1 mm basis. This represents a piece 1 m square and 1 mm thick, or 1/1,000 cubic meter.

Imperial to Metric Conversion Factors for Plywood. Table 5-2 presents commonly used conversions.

U.S. Softwood Veneer and Plywood

Veneer Sheet Thickness. Softwood veneer thicknesses usually range from 1/16 to 5/16 inch, with the most common being 1/10, 1/8, and 1/6 inch. Thicknesses are often expressed by mills in thousandths of an inch. The lathe setting is somewhat larger to account for compression during peeling, peeling variation, and shrinkage during drying. Procedures to calculate the green target thickness
at the lathe are similar to those for lumber explained in Chapter 4 (pp. 58-59).

Veneer Sheet Width. Assuming the common 4 foot plywood panel width, veneer is manufactured in the following nominal widths: 48 inches (full), 24 inches (half), and strip (narrow strips above a minimum salvage size, often 6 inches). Other widths may be produced to correspond to other panel sizes, as shown in Table 5-3. To allow for shrinkage of veneer during drying and trimming of finished plywood panels, these widths are increased to develop target values on machinery. Thus a mill's green clipper may produce full and half widths as 54 and 27 inches respectively. Actual practice will vary from mill to mill based on quality control and other factors.

Veneer Sheet Length. When veneer is obtained from a lathe, veneer length exceeds that of a finished plywood panel. For example, on the common 8 foot lathe, the veneer is initially about 100 to 104 inches long. This oversize length allows for shrinkage when the veneer is dried and for panel trimming. The actual log (block) peeled is somewhat longer than the length of veneer. Veneer lengths correspond to panel lengths shown in Table 5-3. The most common length is 96 inches (8 foot plywood). Crossband widths are half that length. The lineal footage of the veneer ribbon produced from a lathe can be estimated by dividing the square footage by the veneer length.

Plywood Panel Sizes. Table 5-3 presents the dimensions of softwood plywood according to U.S. Product Standard PS 1-83. The most commonly produced panel size is 4 by 8 feet in various thicknesses.

Volume of Veneer or Panels:

1. Converting Surface Measure of Any Thickness to the 3/8 Inch Basis. To convert surface measure of veneer or plywood of some thickness (SM_t) to the 3/8 inch basis (see Example 1), divide the actual thickness (t) in inches by 3/8 inch (t / 0.375 inch) and multiply by the surface measure:

$$SF_{3/8} = SM_t * (t / 0.375) = 2.667 * t * SM_t.$$

Column 4 of Table 5-1 lists values of t/0.375.

Veneer is marketed on the basis of nominal dimensions; the square footage of 1/10 inch full sheets is generally calculated on the basis of nominal dimensions such as 4 by 8 feet and excludes

Table 5-1. *Conversion of actual panel thickness to standard thickness basis.*

Actual Thickness		Conversion to			
(in)	(mm)	1/8 inch basis	3/8 inch basis	1/2 inch basis	3/4 inch basis
(1)	(2)	(3)	(4)	(5)	(6)
1/8	3.18	1.0000	0.3333	0.2500	0.1667
3/16	4.76	1.5000	0.5000	0.3750	0.2500
1/4	6.35	2.0000	0.6667	0.5000	0.3333
5/16	7.94	2.5000	0.8333	0.6250	0.4167
3/8	9.53	3.0000	1.0000	0.7500	0.5000
7/16	11.11	3.5000	1.1667	0.8750	0.5833
1/2	12.70	4.0000	1.3333	1.0000	0.6667
9/16	14.29	4.5000	1.5000	1.1250	0.7500
5/8	15.88	5.0000	1.6667	1.2500	0.8333
11/16	17.46	5.5000	1.8333	1.3750	0.9167
3/4	19.05	6.0000	2.0000	1.5000	1.0000
13/16	20.64	6.5000	2.1667	1.6250	1.0833
7/8	22.23	7.0000	2.3333	1.7500	1.1667
15/16	23.81	7.5000	2.5000	1.8750	1.2500
1	25.40	8.0000	2.6667	2.0000	1.3333
1-1/16	26.99	8.5000	2.8333	2.1250	1.4167
1-1/8	28.58	9.0000	3.0000	2.2500	1.5000
1-3/16	30.16	9.5000	3.1667	2.3750	1.5833
1-1/4	31.75	10.0000	3.3333	2.5000	1.6667

Source: Calculated by the author.

Table 5-2. *Imperial-metric conversion factors for plywood.*

From / To:	SF, 3/8	m^2, 1 mm	MSF, 3/8	1,000 m^2, 1 mm	ft^3	m^3
SF, 3/8	1	0.885	0.001	0.000885	0.03125	0.000885
m^2, 1 mm	1.130	1	0.001130	0.001	0.035315	0.001
MSF, 3/8	1,000	885	1	0.885	31.25	0.885
1,000 m^2, 1 mm	1,130	1,000	1.130	1	35.315	1
ft^3	32	28.318	0.032	0.0283	1	0.0283
m^3	1,130	1,000	1.130	1	35.315	1

Source: Calculated by the author.
Note: The values in the rows for 1,000 m^2, 1 mm basis and for m^3 are identical since a 1,000 m^2 area that is 1 mm thick represents 1 m^3 of volume.

the oversizing required for trim and shrinkage. To estimate the total wood fiber represented, increase the square footage by about 12% (Fahey 1987) or measure a sample of sheets and calculate the adjustment factor needed.

2. Cubic Foot Calculation. The volume, in cubic feet, of a single 4 by 8 foot panel of thickness t inches is

$$\begin{aligned} ft^3 &= (4 * 8 \text{ feet}) * t / 12 \\ &= 32 * t / 12. \end{aligned}$$

Hence the volume of a 1/2 inch thick panel is 1.3333 cubic feet. Substituting other thicknesses results in column 2 of Table 5-4.

When the 3/8 inch thickness is substituted into this formula, the volume of a 4 by 8 foot panel is exactly one cubic foot. In general, the formula to convert the $SF_{3/8}$ equivalent of any panel thickness to cubic feet is

$$ft^3 = SF_{3/8} * (3/8) / 12$$
$$= SF_{3/8} / 32.$$

In section 1 above, it was found that 1,500 square feet of 1/2 inch plywood was equivalent to 2,000 square feet on the 3/8 basis. Substituting this into the above formula results in an equivalent of 62.5 cubic feet of plywood.

If the formula in section 1, which converts surface measure of any thickness to the 3/8 basis, is substituted for $SF_{3/8}$, the following general relationship is found

$$ft^3 = [SM_t * (t / 0.375)] / 32$$
$$= SM_t * t / 12$$
$$= 0.08333 * t * SM_t.$$

This formula directly converts the square footage of any original thickness to cubic feet equivalent. Values of 0.08333 * t are tabulated in column 3 of Table 5-4. The values in column 3 can also be obtained by dividing the cubic foot volume of a 4 by 8 foot panel of given thickness (column 2) by 32 square feet per panel. With this calculation, column 3 can be interpreted as the number of cubic feet of panel per square foot of panel of the indicated thickness. See Example 2.

Since 1,000 square feet (MSF) is a common unit, column 4 reexpresses column 3 in cubic feet per MSF and column 5 converts cubic feet per MSF to cubic meters per MSF. For example, Table 5-4 shows that 1,000 square feet of 3/8 inch plywood is equivalent to 31.25 cubic feet or 0.89 cubic meters. Reciprocals of these values indicate that, for 3/8 inch plywood, there are 0.032 MSF (32.0 square feet) per cubic foot and 1.124 MSF (1,124 square feet) per cubic meter.

These formulas and methods can be used to obtain the cubic foot volume of finished panels or nominally measured veneer. To determine the cubic foot volume of green veneer needed to make the panel, increase the result by 12% to account for layup and trim losses (Fahey 1987).

3. Cubic Meter Calculation. Outside North America, veneer and plywood are produced in metric sizes: width (W) and length (L) in meters, thickness (t) in millimeters. Statistics are normally reported in square meters surface measure (on a 1 mm basis) or cubic meters. Formulas are

SM_t = L * W = surface measure, m^2, of original thickness.

SM_1 = $SM_t * t$ = surface measure, m^2, 1 mm basis.

m^3 = $SM_t * t / 1{,}000 = SM_1 / 1{,}000$.

Example 1

To convert 1,500 square feet of 1/2 inch panels to 3/8 inch basis:

$SF_{3/8}$ = 1,500 * (0.5 inch / 0.375 inch).
= 1,500 * 1.3333 = 2,000 square feet.

The value 1.3333 is also found in Table 5-1, column 4, corresponding to 1/2 inch thickness.

To convert 1,000 square feet of 1/10 inch veneer to 3/8 inch basis:

$SF_{3/8}$ = 1,000 * (0.1 inch / 0.375 inch) = 267 square feet.

Example 2

To convert 1,500 square feet of 1/2 inch plywood:

to the 3/8 basis

Multiply 1,500 by 1.3333 (column 4, Table 5-1) to get 2,000 ft^2 3/8. This is the same result obtained by the formula in section 1 (and Example 1).

to cubic feet (four equivalent calculations are shown)

- ft^3 = $SF_{3/8}$ * 32 = 2,000 / 32 = 62.5.
- ft^3 = 0.08333 * SM_t * t = 0.08333 * 1,500 * 1/2 = 62.5.
- Multiply 1,500 by 0.0417 (column 3, Table 5-4) to get 62.5.
- Multiply 1.5 MSF by 41.7 (column 4, Table 5-4) to get 62.5.

to cubic meters

Multiply 1.5 MSF by 1.18 (column 5, Table 5-4) to get 1.77.

Hardwood Veneer and Plywood

Hardwood plywood is similar to softwood plywood. The main differences in North America

Table 5-3. *Softwood plywood panel sizes.*

Width	36, 48, 60 inches
Length	60 to 144 inches in 12 inch increments
Thickness sanded	1/4 to 1-1/4 inches in 1/8 inch increments
Unsanded	5/16 to 1-1/4 inches in 1/8 inch increments over 3/8 inch
Tolerances sanded	± 1/64 inch for thicknesses ≤ 3/4 inch
	± 3% for thicknesses > 3/4 inch
Unsanded	± 1/32 inch for thicknesses ≤ 13/16 inch
	± 5% for thicknesses > 13/16 inch

Source: USDC (1983a).

Note: Panel thickness is measured at 9% MC_{od}. Panel sizes other than those specified are available on special order.

Table 5-4. *Standard plywood thickness with conversions to cubic volume.*

Panel thickness (inch)	4 by 8 foot panel volume (ft^3)	ft^3 of panel per ft^2 of panel	1,000 ft^2 (MSF) becomes (ft^3)	(m^3)
(1)	(2)	(3)	(4)	(5)
1/8	0.3333	0.01042	10.42	0.29
3/16	0.5000	0.01562	15.62	0.44
1/4	0.6667	0.02083	20.83	0.59
5/16	0.8333	0.02604	26.04	0.74
3/8	1.0000	0.03125	31.25	0.89
7/16	1.1667	0.03646	36.46	1.03
1/2	1.3333	0.04166	41.66	1.18
9/16	1.5000	0.04688	46.88	1.33
5/8	1.6667	0.05208	52.08	1.48
11/16	1.8333	0.05729	57.29	1.62
3/4	2.0000	0.06250	62.50	1.77
13/16	2.1667	0.06771	67.71	1.92
7/8	2.3333	0.07292	72.92	2.06
15/16	2.5000	0.07812	78.12	2.21
1	2.6667	0.08333	83.33	2.36
1-1/16	2.8333	0.08854	88.54	2.51
1-1/8	3.0000	0.09375	93.75	2.65
1-3/16	3.1667	0.09896	98.96	2.80
1-1/4	3.3333	0.10416	104.16	2.95

Source: Calculated by the author.

are that hardwood plywood is more typically produced for appearance uses, thus affecting the sizes of veneers and panels, and it is more common to find hardwood "plywood" where materials other than veneer (particleboard, hardboard, etc.) are used as core stock.

Veneer Sizes. Hardwood veneers are produced in a variety of ways. While softwood veneer is predominantly rotary cut from logs, hardwood veneer may be rotary cut or sliced. Usual slicing options are plain cut, quarter cut, half round, or rift cut. Each of these cutting patterns produces a unique grain pattern in the veneer. The raw material for slicing is commonly a flitch sawn from a log in such a way as to expose one of the desired grain patterns. Veneer is manufactured in thicknesses ranging from 1/50 to 1/4 of an inch, though on special order it can range from 1/200 to 1/2 inch. An average value to use would be either 1/16 or 1/32 inch, with 1/16 being the average of maximum and minimum thicknesses across the industry. Specifications and terminology for hardwood and decorative plywood are described in Product Standard PS 51-71 (USDC 1971). The standard specifies only the maximum thickness of veneer, which varies depending on species category and plywood type. The range of maximum standard thicknesses is from 1/12 to 1/4 inch.

Flitches may be random length but often are in whole foot increments. Flitches may also include some of the round curvature of the log, so each slice of veneer from a flitch may be of a different width. Slices are trimmed to have parallel edges. Slices from a flitch may be random width or trimmed to a uniform width. Customs for manufacture of veneer differ between North America and overseas producers.

Plywood Panel Sizes. Hardwood plywood is more of a speciality product than softwood plywood is. As such, it comes in a variety of sizes and shapes, both standard and nonstandard. Common panel sizes are 48 inches wide in 84, 96, and 120 inch lengths and 1/8 to 3/4 inch thicknesses. The most common size encountered on the retail market is a 4 by 8 foot sheet in 3/8 inch thickness. Due to the speciality nature of hardwood plywood, the specifications of a panel are determined more by the buyer than the mill. The buyer can also specify the core material of the panel. There are a number of options in core materials such as softwood or hardwood veneer, softwood or hardwood lumber, particleboard, hardboard, waferboard, and other specialty materials. It has been estimated that about 38% of the production volume of cores is softwood material (USDC 1987). Manufacturing tolerances for panels are listed in Table 5-5.

Table 5-5. *Hardwood plywood panel tolerances.*

Length	± 1/32 inch
Width	± 1/32 inch
Thickness, unsanded	± 1/32 inch
Thickness, sanded	+ 0 –3/64 inch for ≥ 1/4 inch
	+ 0 –1/32 inch for ≤ 1/4 inch

Source: USDC (1972); PS 51-71.

Volume of Veneer or Panels. The methods discussed above for softwoods apply. Hardwood veneer is usually reported on a surface measure basis. To convert this to cubic feet, use the thicknesses mentioned earlier, remembering to convert them to feet. For 1/32 inch veneer use 0.0026 and for 1/16 inch use 0.0052 as the conversion factors from square foot to cubic foot.

Hardwood plywood statistics are reported on either the same $SF_{3/8}$ basis as softwood plywood or on a surface measure basis. The surface measure statistics often combine a number of thicknesses, making conversion to cubic volume difficult.

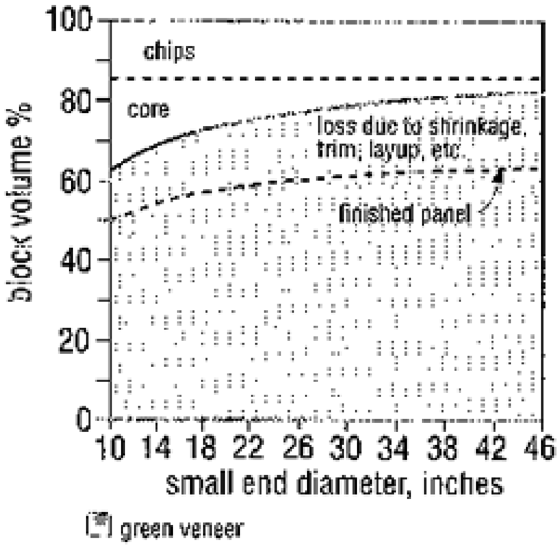
Recovery Efficiency

Material Balance Green-End Recovery

The green end of a plant refers to all manufacturing activities up to the point of drying veneer; the product of this portion of the plant is clipped green veneer. Many facilities exist that produce and market green veneer.

From Mill Studies. Figures 5-1 and 5-2 present a generalized material balance for Douglas-fir peeler blocks of different small-end diameters (Fahey 1987). A block is the standard log segment mounted in a lathe and is approximately 8.5 feet long. The figures show the fraction of cubic volume that is converted into green veneer, chips (roundup, spur trim, and reject veneer), and the core (solid cylinder that remains after peeling). The fraction of block cubic volume recovered as veneer is the cubic recovery ratio (CRR).

Figure 5-1. *The percentage of block volume recovered in various classes of green and dry veneer. Source: Fahey (1987).*



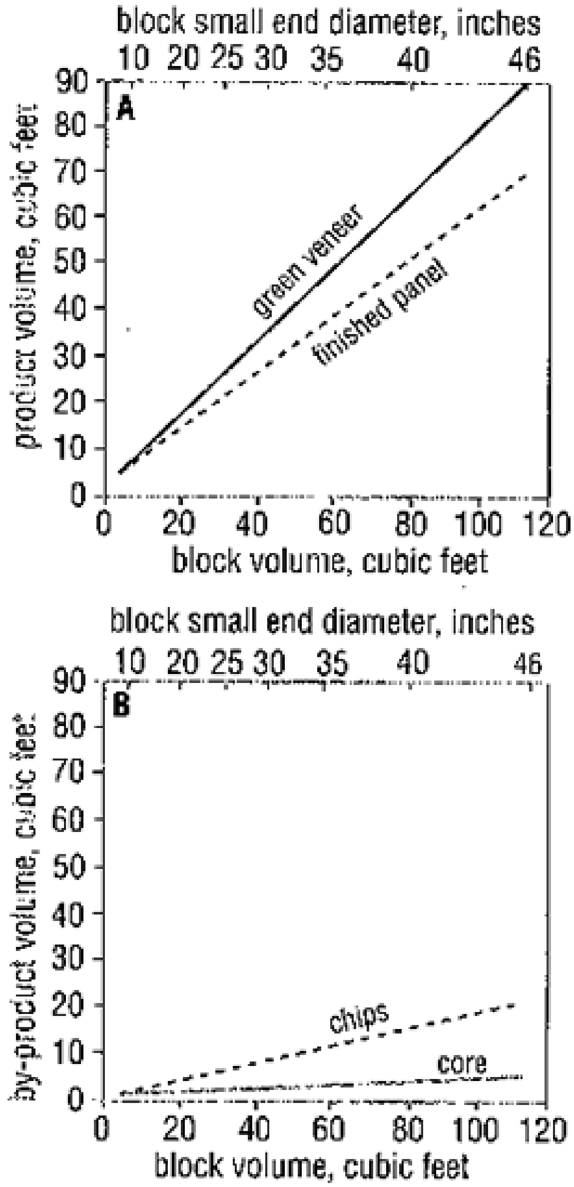
As block diameter increases, the percentage of volume recovered as green veneer increases, the percentage of core decreases, and the percentage of chipped residuals is essentially constant. The most rapid change occurs in small-diameter blocks. Dry veneer volume equals green veneer volume minus shrinkage and panel trim. This loss is a constant percentage of green veneer volume. Thus the dry veneer recovery is roughly 78% of the green veneer recovery whatever the diameter (Fahey 1987).

Figure 5-2 shows that percentage recovery of veneer, chips, and core increases as block volume increases.

There are many factors that affect the volume recovered as green veneer:

- *The amount of defects present.* Generally blocks with large limbs, decay, sweep, and eccentric cross section will yield less veneer. This can cause CRR to decrease in larger block diameters, particularly from large young-growth blocks that may have very large limbs, leading to veneer breakage, clipper loss, and below-grade veneer.

Figure 5-2. *Volume of green or dry veneer and of chips and core in relation to volume of the block. Source: Fahey (1987).*



- *Coarseness of growth.* Often fast-grown logs yield veneer with a rougher surface or veneer that splits more easily during handling, thus resulting in more clipper loss.

- *Peeling technology*. Block centering equipment, optimizing clipping equipment, and so forth, will increase recovery. New lathe technology, such as the spindleless lathe, can reduce core diameter and hence increase recovery.
- *Veneer clipping policy*. Particularly important is the minimum size salvaged as random width strips as well as salvage of fish tails.
- *Market values and mill location*. These factors affect the marginal decision regarding what is converted to veneer and what is chipped.

Material balances for various species can be obtained from recovery studies conducted by the Timber Quality Research Unit of the USDA Forest Service Pacific Northwest Research Station.

Theoretical Material Balance. Another approach for predicting elements of the material balance is to estimate them from simple mathematical relationships. See, for example, the following elements (in cubic feet):

Block volume = $0.002727 * (ds^2 + dl^2) * L$ (Smalian's cubic log volume)

Core volume = $0.005454 * dc^2 * L$ (cylinder)

Veneer volume = $0.005454 * (ds^2 - dc^2) * L1$ (difference between two cylinders)

Residue = by subtraction

where

ds = small end diameter of block, in inches

dl = large end diameter of block, in inches

L = block length, in feet

dc = diameter of core, in inches

L1 = veneer length between spur knives, in feet.

This approach gives theoretical yields that do not include the effects of clipping, log abnormalities, and so forth. Thus the veneer volume is overstated and residue volume is understated. The technique is a useful way to study the effect of changes in log geometry or core size on yield. The resulting cubic foot volume of veneer can be easily expressed on a 3/8 inch basis or other thickness basis.

Material Balance Dry-End Recovery

The material balance presented in Figures 5-1 and 5-2 also shows recovery after "dry-end" activities, including drying veneer, reclipping, assembly into plywood, and panel trimming. Volume change due to veneer shrinkage is 2 to 3%. Other losses, mainly panel trim and sanding, are about 9 to 10%. Sometimes these dry-end processes are integrated with the green-end facilities in the same plant and in other cases they are independent. Dry-end recoveries can be expressed either on an original block volume basis or in terms of green veneer recovered, as illustrated in Table 5-6, which shows that 59.1% of the original block volume (78.2% of the green veneer recovered) finds its way into the finished panel.

Table 5-6. *Veneer recovery of Douglas-fir.*

Use and loss	Percentage of block volume	Percentage of green veneer volume
Block volume	100.0	
Roundup, spur, clip	–15.7	
Peeler core	–8.7	
Green veneer	75.6	100.0
Shrinkage	–8.3	–11.0
Dry, untrimmed veneer	67.3	89.0
Trim, layup, other loss	–8.2	–10.8
Finished panel	59.1	78.2

Source: Fahey (1987).

Recovery Efficiency Measures

Cubic Recovery Ratio (CRR). Cubic recovery ratio is the cubic volume of recovered veneer divided by the cubic volume of the veneer block or log, and can be calculated for different stages of manufacture. Green cubic recovery ratio (CRR_g) is the actual volume of green clipped veneer divided by the block volume, both in cubic feet. It is the measure in Figure 5-1. Dry cubic recovery ratio (CRR_d) is the actual volume of dry clipped veneer divided by block volume, both in cubic feet. This includes shrinkage loss and additional dry clipping or handling losses. Nominal green or dry cubic recovery ratio (CRR_{ng}, CRR_{nd}) can be based on the nominal sheet sizes rather than the larger actual size needed to accommodate panel trim. With current industry practice, the trim size effect is about 12% (Fahey 1987). These measures reflect the net veneer that will be in finished plywood panels rather than the total wood requirement. The USFS timber assessment estimates a national average CRR_{nd} of 44.5% (Appendix 2). CRR_{nd} is represented in Figures 5-1 and 5-2 by the "finished panel" lines.

The above measures are typically based on the nominal panel thickness (i.e., 1/8 inch, 1/10 inch, etc.) and can be amended by using the actual thickness setting on the lathe. This is typically larger than the nominal thickness to account for shrinkage, compression, thickness variation, and so forth. Green target cubic recovery ratio (CRR_{gt}) can be expressed for either the nominal length and width of sheets or using the actual green sizes.

Veneer Recovery Factor (VRF). Veneer recovery factor is the $SF_{3/8}$ basis of recovered veneer divided by the cubic feet of log volume. VRF can be calculated as a counterpart to CRR for each of the degrees of manufacture discussed in the previous section. The USFS timber assessment estimates a national average of 14.1 square feet of 3/8 inch nominal veneer per cubic foot of log used (Appendix 2).

Relationship Between CRR and VRF. Since

CRR = veneer, ft^3 / log, ft^3,

VRF = $SF_{3/8}$ / log, ft^3,

and veneer, $ft^3 = SF_{3/8} / 32$,

one can derive $VRF_{3/8} = 32 * CRR$.

See Example 3.

If a thickness basis (t) other than 3/8 inch is desired, remember that $SF_{3/8} = SM * (t / 0.375)$, hence

$VRF_t = 12 * CRR / t$.

Since CRR and VRF can be measured for different states of manufacture (i.e., green vs. dry veneer), it is important to maintain consistency.

Veneer Recovery and Board Foot Log Scale. When board foot log scales are used, it is a common practice of mills to relate veneer recovery to board foot volume of blocks. This is also called a veneer recovery factor or veneer recovery ratio (VRR), which is defined as the recovered veneer in $SF_{3/8}$ basis divided by BF log scale.

VRR historically has been between 2.5 and 3.0 $SF_{3/8}$ per BF for various board foot log scales. Recent improvements in technology, combined with smaller logs that are underscaled in Scribner log scale, are pushing CRR above 3.0. Because of the behavior of some BF log rules, the VRR measure, like overrun for lumber, can be very sensitive to small changes in block diameter and other factors unrelated to milling. VRR does not behave in a

Example 3

An 8 foot 6 inch long block is 16 inches in diameter at the small end and 17 inches in diameter at the large end. It will be peeled into 1/10 inch veneer with 100 inches (8.33 feet) between the spur knives. The results presented are based on the nominal 1/10 inch thickness. If the actual veneer thickness setting on the lathe is 0.108 inch, the quantities calculated can be adjusted accordingly.

Block volume (Smalian's formula) — 12.6 ft^3

Recovery

1/10 inch veneer based on full dimension of recovered veneer			780 ft^2
Lineal footage of 1/10 inch veneer = 780/8.33			93.6 ft
1/10 inch veneer based on nominal dimension of sheets, decrease by 12%			686 ft^2
3/8 inch basis:	Actual		208 ft^2
	Nominal		183 ft^2
Cubic feet:	Actual =	208/32	6.5 ft^3
	Nominal =	183/32	5.7 ft^3

Cubic recovery ratio (CRR_{rg}):

Actual	=	6.5/12.6	0.51 or 51%
Nominal	=	5.7/12.6	0.45 or 45%

Veneer recovery factor (VRF_{rg}):

3/8 inch basis:

Actual	=	208/12.6	16.5 ft^2/ft^3
Nominal	=	183/12.6	14.5 ft^2/ft^3

Veneer recovery related to Scribner volume:

3/8 inch basis:

Scribner volume of a 16 inch x 8 foot block = 80 BF

VRF-Scribner = 208/80 = 2.6 ft^2/BF

consistent manner and thus is not a recommended measure of mill efficiency.

This measure points out another inadequacy of board foot log rules, which were originally designed to predict lumber outturn. Here we see a strange hybrid where an estimate of lumber recovery is used to predict veneer recovery.

Weight of Veneer and Plywood

Shipping weights of veneer and lumber can usually be obtained from appropriate trade associations and freight companies. In the absence of this information, procedures outlined in Chapter 1 can be used. See page 10 for examples for plywood and green veneer.