

**Forest Service Handbook
National Headquarters - Washington Office
Washington, DC**

**Forest Service Handbook 2409.11 – National Forest Log Scaling Handbook
Chapter 70 - Use of International Log Rules**

Amendment: 2409.11-2006-1

Effective date: October 30, 2006

Duration: This amendment is effective until superseded or removed.

Approved by: Gregory Smith, For Joel Holtrop, Deputy Chief

Date approved: April 20, 2006

Responsible Staff:

Last Change: Amendment No. 7

Superseded Document(s): Entire Handbook, Title Page thru 247

Digest: Following is an explanation of the changes throughout the directive by section.

10: Corrects minor typographical and technical errors throughout the chapter. Substantive changes are as follows:

13: Clarifies in paragraph 1 that the standard unit for saw timber scaling will be in cubic foot log scale, although board foot log scale is used under certain circumstances.

17.12: Changes the caption in exhibit 02 to clarify direction to allow full trim in the length measurement and record in 2 foot multiples.

17.18: Adds new direction and an exhibit for length measurements on forked logs.

17.2: Clarifies scalers will notify the contracting officer when improper trim allowance is detected.

17.3: Adds direction on how to record logs that are further reduced to the lower 2 foot multiple, but the diameter increases to the next diameter class, the increased diameter will be recorded as the proper scaling diameter.

17.33: Adds a list of butt characteristics to assist in identifying butt cut logs.

20: Corrects minor typographical and technical errors throughout the chapter. There are no changes to the substantive direction in this chapter.

30: Corrects minor typographical and technical errors throughout the chapter. Substantive changes are as follows:

33: Establishes defect types and new deduction procedures for: Burls, Foreign Material, Pecky Rot, Pistol Butt Defect, Pitch Pockets, and Spiral Grain.

Slope of Grain, and Twist have been included in the Spiral Grain definition.

Barber Chair and Pull, Stump or Sliver has been included in the Breaks and Splits definition.

Bark Seam has been included in the Pitch Seam, Heart Check, Frost Crack definition.

Adds new direction and exhibits for crook defect deduction process.

Combines Knots, large and Knots, clusters into a single new defect type, Knots. Establishes new knot size limits and knot deduction guide.

Adds definition of massed pitch and clarification of when a deduction is necessary.

Adds clarification of scaling cylinder position when deducting for sweep.

Reformats and rennumbers entire section to conform to FSH 2409.11a - Cubic Scaling Handbook, chapter 20.

40: Corrects minor typographical and technical errors throughout the chapter. Substantive changes are as follows:

44: Changes caption from Stump Scaling to Timber Trespass. Provides direction for measurements to be performed by certified scalers and cruisers and requires coordination with Law Enforcement staff prior to beginning field work.

44.1: Changes caption from Timber Trespass to Stump Scaling.

44.2: Changes caption from Scaling when Stump and other Direct Evidence is lacking to Stump Cruising.

44.3: Established this code and recodes direction formerly at section 44.2 to this section.

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51: Changes caption to selection of scaling locations. Changes responsibility for selection of scaling locations from District Ranger to Contracting Officer. Also removes direction on selecting truck-scaling locations.

52: Removes requirement for Forest Supervisor to develop additional safety specifications for scaling.

53: Removes the direction which discusses the need for the purchaser to keep government logs separate from private logs up to the point of scaling and for the use of distinctive marking between various sales.

54.1: Changes the direction for team scaling from "discouraged" to "must not be used." Also removes direction Regional Forester to authorize team scaling in limited situations. Changes the responsibility for taking corrective action when scalers to not perform to standard from District Ranger to Contracting Officer.

54.2: Removes direction on the benefits of mill visits and specific direction concerning various items to be observed while conducting a mill visit.

55.2 - 55.4: Removes obsolete direction, which referenced out of date equipment, processes and procedures.

55.5: Revises and recodes to section 55.2. Changes the responsibility for completing the Scaler Information Form from the Forest Service Representative to the Contracting Officer.

55.61: Removes section on standard scaling forms.

55.62: Recodes to section 553.

55.63: Recodes to section 55.4. Removes significant amount of instruction, including exhibit's 01 and 02, on how to fill in scaling sheets. Stresses the use of field data recorders to record scaling information.

55.64 - 55.65: Removes obsolete direction from handbook.

56.1: Removes obsolete from handbook.

56.21: Removes obsolete direction from handbook.

56.22: Recodes to section 56.1.

56.3: Removes obsolete direction from handbook.

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60: Corrects minor typographical and technical errors throughout the chapter. Substantive changes are as follows:

64: Increases situations where Regional Foresters may deviate from established check scale standards.

65: Revises to require minimum check scale record and summary information. Removes outdated policy, procedures, and forms.

70: Reformats chapter.

71: Updates CFR reference.

80: Corrects minor typographical and technical errors throughout the chapter. Substantive changes are as follows:

82: Deletes previous documentation which was incomplete and adds reference to National Forest Cubic Scaling Handbook (FSH 2409.11a) for handbook direction.

85: Adds a cross reference on sample scaling to Forest Service Handbook 2409.11a, National Forest Cubic Scaling Handbook, chapter 50.

85.5: Recodes to section 86.1.

85.6: Recodes to section 86.2.

87.42: Establishes new direction for Fiber Scaling.

Appendix: Renames exhibits from "Table" to "Appendix." Removes Table 1A, Table VIII, Table IX - Exhibit A, Table XIV. Adds Appendix 15 - Factors for Computing Scribner decimal C Volumes and Appendix 16 - Scribner Decimal C Recorded Length and Segment Lengths.

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70.1 - Authority

Title 36 of the Code of Federal Regulations, part 223, section 223.36(b) (36 CFR 22336(b)) sets out the authority for using the International 1/4-inch log rule or the International 1/4-inch Decimal Rule in log scaling.

70.3 - Policy

1. Use of International 1/4-inch log rule to obtain log scale more nearly equal to the lumber tally.
2. Use the Forest Service International 1/4-inch Decimal rule whenever necessary. This rule is applied the same as the Inter-national 1/4-inch log rule. The principal difference is that volumes are rounded to the nearest 10 board feet. Regional Foresters may authorize the use of either of these rules on any saw timber sale.
3. Use the same general scaling practices with these rules including defect deductions, as with the Scribner Decimal C rule. Differences in detail are explained in sections 71 through 74 below.

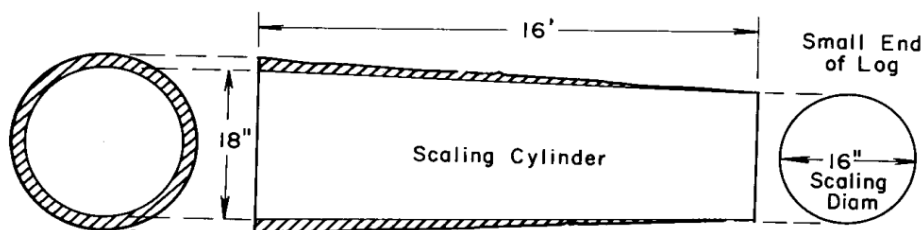
Appendix X in the appendix chapter gives the board foot contents of logs 4 to 20 feet long based on the International 1/4-inch log rule. Appendix XI in the appendix chapter gives those based on the Forest Service International 1/4-Inch Decimal rule.

71 - Scaling Cylinder In International Rule

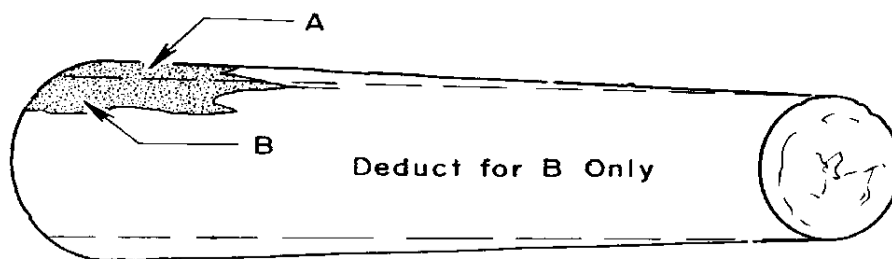
The International 1/4-inch log rule is based on a formula applied to each 4-foot section of the log and an assumed taper of 1/2 inch in each 4 feet (2 inches in 16 feet). Thus the International scaling cylinder differs from that used with the Scribner Decimal C rule. For practical purposes, assume that the scaling cylinder becomes a frustum of a cone with a taper of 2 inches in 16 feet. See sec. 71-exhibits 01, 02, and 03 and compare them with chapter 10, sec. 18-exhibits 01, 02, and 03.

The International 1/4-inch log rule considers a 1-inch collar for slab, as does Forest service practice with the Scribner Decimal C rule. For sap rot and similar side defects, use of the tapered scaling cylinder results in larger deductions in comparison to deductions by the Scribner rule with its non-tapered scaling cylinder.

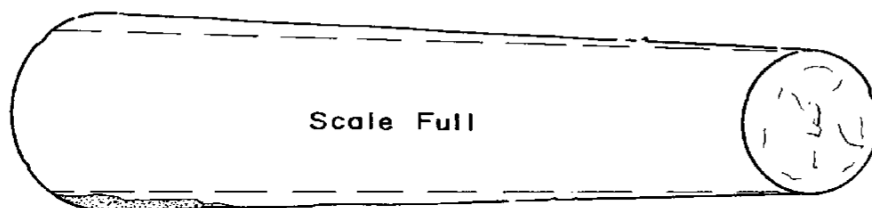
71 - Exhibit 01
Scaling Cylinder for International Rule



71 - Exhibit 02
Defect Both Inside and Outside the Scale Cylinder



71 - Exhibit 03
Defect Outside the Scaling Cylinder



72 - Mill Overrun

Normally where the International 1/4-inch log rule is used, log scale closely corresponds to lumber tally. The rule considers a minimum board of 2 board feet. Inch lumber is considered if 3 inches wide by 8 feet long or any other combinations of dimensions making 2 board feet, down to 12 inches wide by 2 feet long. If a mill does not practice such good utilization, an underrun could result.

73 - Log Lengths

1. In Forest Service scaling, logs as long as 20 feet are scaled as one log by the International 1/4-inch log rule and the Forest Service International 1/4-Inch Decimal rule; that is, if studies show that local timber does not greatly exceed the assumed taper of 2 inches in 16 feet. Where logs from 16 to 20 feet long average 3 inches or more taper in 16 feet, use the maximum scaling length of 16 feet. Where this condition exists, the timber sale contract should stipulate the maximum scaling length.

- a. Example: With the International 1/4-Inch rule, a 16-inch log, 20 feet long, scales 235 board feet. If this log has the taper assumed in the log rule, the large-end diameter is 18 1/2 inches. But if this log were typical and had a large-end diameter of 19 3/4 inches, there would be 3-inch taper in 16 feet.

2. To scale railroad ties cut 8 1/2 feet long, scale an 8 1/2-foot log as an 8-foot log unless the difference between the scale of an 8- and a 9-foot log is 10 board feet. If so, add 5 feet to the scale of the 8-foot log.

3. If the difference is 15 feet or more, add half the difference. But use the next lower 5 feet where half the difference does not fall on a 5-foot interval. (Half of 15 is 7 1/2 use 5.)

- a. Example: Scale a 10-inch, 8 1/2-foot log as an 8-foot log, with 30 board feet.
- b. Example: Scale a 15-inch, 8 1/2-foot log as an 8-foot log with 75 board feet, plus 5 feet (half the difference between the scale of an 8- and a 9-foot log), or 80 board feet.
- c. Example: Scale a 17-inch, 8 1/2-foot log as an 8-foot log with 95 board feet plus 5 feet (half the difference between the scale of an 8- and a 9-foot log (15 feet) rounded down to the nearest 5 feet) or 100 board feet.

74 - Defect Deductions

The International 1/4-inch log rule and the Forest Service International 1/4-Inch Decimal rule allow 1/16 inch for shrinkage in addition to the 1/4 inch for saw kerf. The net effect is to give a squared-defect deduction formula almost identical to the "shortcut" one used with the Scribner rule. The basic formula is:

$$\frac{\text{Height in inches} \times \text{width in inches} \times \text{length in feet}}{16}$$

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However, with the International 1/4-inch log rule, round the product of height by width to the nearest 5; with the Forest Service International 1/4-Inch Decimal Rule, round to the nearest 10, above or below.

When defects extend all the way through a log, use their average dimensions. Do this because the International 1/4-inch log rule is based on the use of short and narrow material.

For sap-rot and side-defect deductions, see discussion in section 71.

Also refer to appendices XII and XIII in the appendix chapter, showing defect allowances under the International 1/4-Inch log rule and the Forest Service International 1/4-inch Decimal log rule.