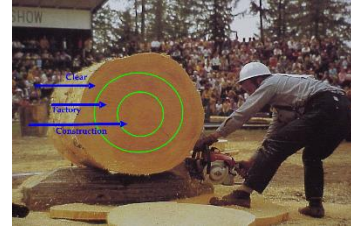


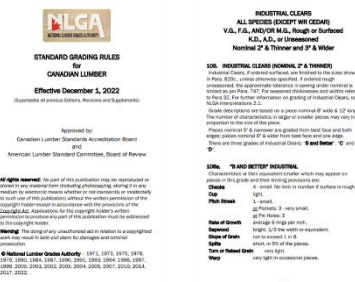
NLGA Industrial Clears – Lesson 3

I. Introduction:

- Focus on clear lumber from the outer zone of logs.
- Importance of understanding desirable qualities for different uses.



II. NLGA Role:



- a) Defines lumber grading rules and standards in Canada.
- b) Paragraph 108 covers Industrial Clears for appearance products (except Western Red Cedar).

III. Grading Table:

- Color-coded yellow for two inches and thinner.
- Columns list characteristics for each grade; rows specify permitted characteristics and amounts.

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IV. Lumber Grading:

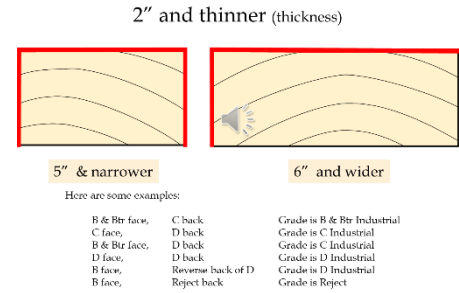
- a) Finished sizes shown in paragraph 820c.
- b) Sold as S2S KD, rough green, rough KD, or S4S clear pullouts.
- c) Export markets: USA, Europe, Japan.
- d) End uses: garage doors, cabinets, furniture, windows, doors, paneling.

V. Thickness Classifications:

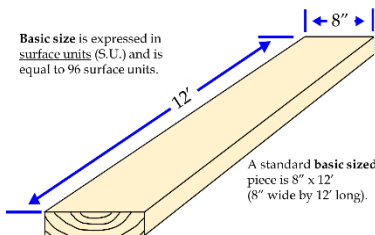
- Two inches and thinner, and two-and-a-quarter inches and thicker.
- Only two inches and thinner taught in grading classes.
- Grades: B-and-better-industrial, C-industrial, D-industrial.

VI. Grading Approach:

- Grade from the best face; reverse face can be one grade lower.
- Pieces five inches and narrower graded from best face and both edges.
- Pieces six inches and wider graded from best face and one edge.
- Overall grade based on best face unless worst face is more than one grade lower.



VII. Characteristics Description:



- Based on a piece eight inches wide by twelve feet long (basic size).
- Larger pieces permit more characteristics; smaller pieces permit fewer.
- Size referred to in surface units (length in feet x nominal width in inches).

VIII. Surfacing and Dressing:

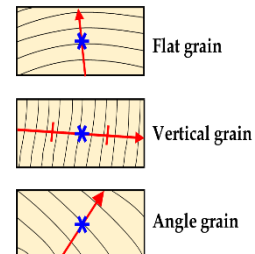
- Generally surfaced on two wide faces (S2S); edges left rough.
- Characteristics assessed after final dressing.
- Characteristics removed by dressing are "dressed off" or "dressed out."

IX. Caution for Students:

- Use caution when dressing off pockets, pin holes, grub holes, or teredo holes.
- No allowance for dressing in rough lumber.

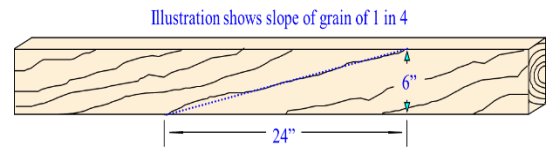
X. Rate of Growth:

- Measured along the center three inches of the longest radial line on the best end section.
- B-and-better-industrial requires six rings per inch.
- C-industrial and D-industrial have no rate-of-growth requirement.
- Calculation methods for flat grain, vertical grain, and angle grain pieces.



XI. Slope of Grain:

- a) Deviation of wood fibers from a parallel line.
- b) Measure at the worst area, calculate as a ratio.
- c) Ratios: B-and-better-clear (1 in 8), C-clear (1 in 6), D-clear (1 in 4).



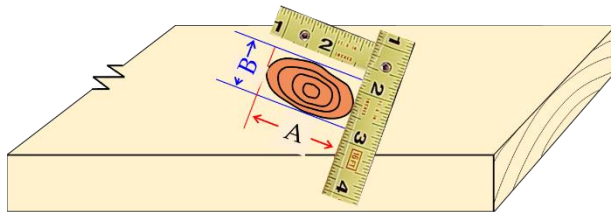
XII. Splits:

- a) Measured on each face separately, from the worst face.
- b) Maximum length: No longer than the width of the piece.
- c) D-clear splits may be 25% longer.

XIII. Knots, Pin Holes, Pockets, Pitch Streaks:

- a) Permitted in B-and-better-clear and C-clear as combinations.
- b) D-clear permits all characteristics on the same piece.

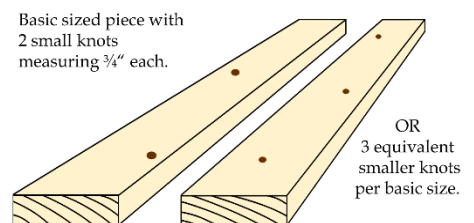
XIV. Knot Measurement:



- a) Average diameter on the face they occur.
- b) Use smallest rectangle to enclose the knot.
- c) Best practices: Start at 1-inch line, use tape measure to add measurements.

XV. C-Clear Knots:

- a) Sound and tight quality.
- b) Two small knots averaging $\frac{3}{4}$ inch or three smaller knots per basic size.
- c) Total of three knots must not exceed $1\frac{1}{2}$ inches.



XVI. Characteristics by Piece Size:

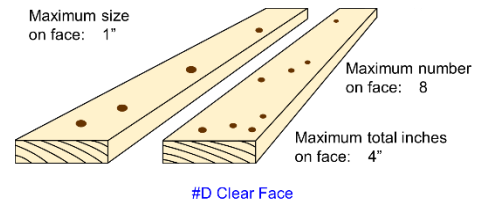
- a) Larger pieces permit more characteristics, smaller pieces permit fewer.
- b) Example: 8-inch by 12-foot piece with no knots on face (B-and-better-clear), reverse face with three $\frac{1}{2}$ -inch knots (B-and-better-clear).

XVII. Proportional Knot Allowance:

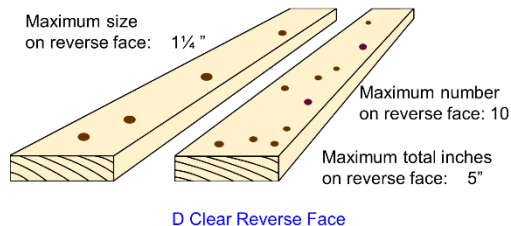
- a) Example: 6-inch by 12-foot piece (72 surface units) is $\frac{3}{4}$ basic size.
- b) C-clear: 3 knots, total combined size $1\frac{1}{8}$ inches, none exceeding $\frac{3}{4}$ inch.

XVIII. D-Clear Knots:

- a) Maximum size 1 inch, maximum 8 knots.
- b) Total combined size of all knots must not exceed 4 inches.
- c) Knots on adjacent narrow face counted for number, not size.



XIX. Knots on Reverse Face of D-clear:



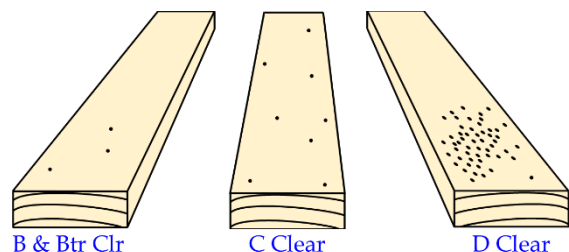
- a) Maximum size: $1\frac{1}{4}$ inches (25% larger).
- b) Number: Up to 10 smaller knots.
- c) Total combined size: 5 inches.
- d) Knots on adjacent narrow face counted for number, not size.

XX. NLGA Industrial-clear Knot Look-up Table:

- a) Size classification: Two inches and thinner.
- b) Grades: C-clear, D-clear, reverse face of D-clear.
- c) Color-coded: Blue (C-clear), green (D-clear), gray (reverse face of D-clear).
- d) Example: Four-inch width in C-clear.

XXI. Pin Holes:

- a) Caused by Ambrosia Beetle, $\frac{1}{16}$ inch diameter.
- b) Allowance: 3 in B-and-better-clear, 8 in C-clear per basic size.
- c) D-clear: 30 per square foot on face, 38 on reverse face, with 25% increase in worst area.



XXII. Pockets:

- a) Restricted by individual size and combined length.
- b) No pocket exceeds maximum length specified in each grade.

XXIII. Warp:

- a) Disregard in grading classes.
- b) Know forms: Crook, bow, cup, twist.

XXIV. Checks:

- a) Considered in kiln-dried lumber.
- b) Small checks (4 inches) in B-and-better, C-clear.
- c) Medium checks (10 inches) and occasional 15-inch check in D-clear.
- d) Reverse face of D-clear: 20-inch checks.

XXV. Torn Grain Classifications:

- a) Very light: $\leq 1/64$ inch.
- b) Light: $\leq 1/32$ inch.
- c) Medium: $\leq 1/16$ inch.
- d) Heavy: $\leq 1/8$ inch.
- e) Very heavy: $> 1/8$ inch.
- f) B-and-better-clear: Very light torn grain.
- g) C-clear: Light torn grain.
- h) D-clear: Any amount of torn grain.

XXVI. Machine Burn - B-and-better-clear:

- a) Natural finish grade.
- b) Allows light sanding for burn removal.

XXVII. Machine Burn - C-clear:

- a) Paint grade.
- b) Can be dark but not black, must have light depth.

XXVIII. Machine Burn - D-Clear:

- a) Depth and color not controlled.
- b) **Hint:** Use fingers to judge severity.

XXIX. Skip - B-and-better-clear:

- a) No skip allowed on face.
- b) Skip on back equivalent to C-clear face.

XXX. Skip - C-Clear:

- a) Face: Very light skip ($\leq 1/64$ inch deep by 6 inches long on 20% of face).
- b) Back and edges: Light skips ($\leq 1/32$ inch deep by 12 inches long on 20% of face).

XXXI. Skip - Notes:

- a. Skip on back in C-clear prescribed by grade, not one grade lower.
- b. Skips may be twice as long if only half the face width is affected.

XXXII. D-Clear Face:

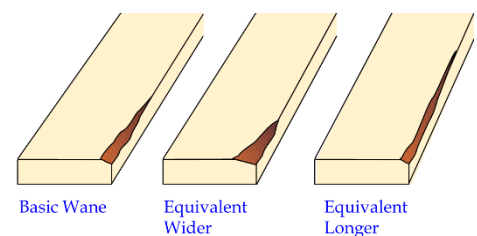
- a. Hit-and-miss ($\leq 1/16$ inch deep, max length 4 feet).
- b. S4S pieces may be $1/8$ inch scant in width, full length.

XXXIII. Industrial Clears:

- a. Often manufactured S2S, edges intended to be rough.

XXXIV. Wane:

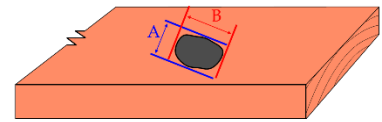
- a) Highest grade permitting wane on best face is D-clear.
- b) Evaluate face and edge separately.
- c) Basic wane allowance: $1/8$ width for $1/6$ length.
- d) Example: 2-by-8-by-12-foot piece allows 1 inch wide by 24 inches long (24 square inches).
- e) Edge wane: Max depth $1/4$ thickness, full length.
- f) Additional 50% wane on reverse face only.



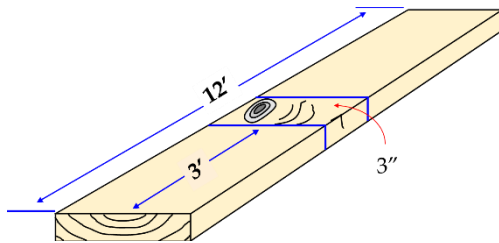
XXXV. Holes:

- 1¼-inch holes permitted in D-clear on face (or back of C-clear) per basic size.
- Smaller holes acceptable if total size does not exceed allowed sum.
- Holes over 1/2 inch accepted as cut-out.

□ Holes are measured by average diameter.



XXXVI. Cutout Allowance:



- D-clear allows 3-inch cutout.
- Irregularity must not be within 3 feet from ends, piece must be ≥ 12 feet long.
- Examples: Oversize knot hole, too much wane, oversize knot, too many pinholes, waste.

XXXVII. Goal-post Characteristics:

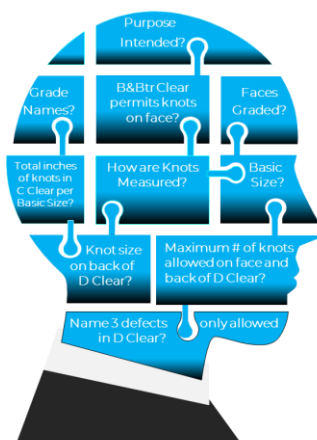
- Automatically restrict piece to D-clear grade.
- Memorize to expedite grading.

□ The following characteristics, if present on the best face, automatically restrict the piece to no higher than D Clear:

- wane
- white specks
- holes
- cut out

NLGA Industrial Clear Review

Some Thought-Provoking Concepts



- Basic Size?
8" x 12' = 96 Surface Units
- Grade Names?
B&Btr Clear, C Clear, and D Clear
- Faces Graded?
6" & wider, best face and 1 edge; 5" & narrower, best face and both edges
- How are Knots Measured?
Average Diameter.
- Purpose Intended?
Appearance
- Does B&Btr Clear permit knots on the best face?
No
- Max. knot size allowed on back of D Clear?
1 ¼"
- Name 3 defects ONLY permitted in D Clear?
Wane, Holes, and Cut-Out.
- Maximum # of knots allowed on face and back of D Clear per basic size?
Face = 8; Back = 10
- Max. total inches of all 3 knots permitted in C Clear per basic size?
1 ½"