



AMERICAN INSTITUTE OF TIMBER CONSTRUCTION

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AITC 110-2001

STANDARD APPEARANCE GRADES FOR STRUCTURAL GLUED LAMINATED TIMBER

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1. INTRODUCTION

- 1.1 Various grades of appearance are desired for different uses. The appearance grades apply to the surfaces of glued laminated members and include such items as growth characteristics, void filling and surfacing operations but not laminating procedures, stains, varnishes, or other finishes, nor wrappings, cratings, or other protective coverings. The appearance grades do not modify the design stresses, fabrication controls, grades of lumber used and other provisions of the standards for structural glued laminated timber.
- 1.2 The appearance grades are for the guidance of the designer so that a product consistent with the use of the structure may be specified and provide a suitable appearance at appropriate cost. The designer should specify the desired appearance grade to give a clear understanding between buyer and seller. Requirements given in appearance descriptions are intended to achieve a general and distinctive uniformity of appearance, and reasonable tolerance is permitted. Appearance grading should reflect good judgment. Often the natural growth characteristics of the wood enhance the beauty of the member and help avoid an artificial appearance.
- 1.3 Four appearance grades — Framing, Industrial, Architectural and Premium—are applicable to all species or mixtures of species used in laminating. Some combinations in AITC 117, *Standard Specifications for Structural Glued Laminated Timber of Softwood Species*, permit the mixing of species within a given member; subsequently, the potential for differences in color or grain of adjacent laminations must be recognized. For those appearance applications where differences in color or grain might be important, the designer may specify a single species or species group. This may restrict availability.
- 1.4 When members containing wood filler are stained, the filler may not accept the stain in the same manner as the adjacent wood. In addition, filler exposed to the elements may weather differently than the adjacent wood. The buyer should check with the supplier concerning past experience in these matters before specifying.

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- 1.5 Preservative treatment may affect the appearance of the finished laminated timber. See AITC 109, *Standard for Preservative Treatment of Structural Glued Laminated Timber*, for detailed information.
- 1.6 When cover boards are not used, a sloping end cut exposed to view shall have the same appearance requirements for loose knots, knot holes, etc., that are required for the sides of members.

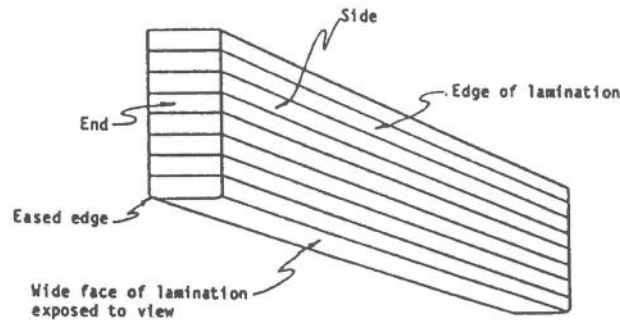


FIGURE 1. Illustration of Terms Related to Appearance Grades

2. TEXTURED SURFACES

- 2.1 When specified by the designer, a textured surface may be used. Textured surfaces are produced by a variety of methods and the buyer should check with the supplier before specifying.
- 2.2 Textured surfaces may change the net finished sizes and tolerances given in AITC 113, *Standard for Dimensions of Glued Laminated Structural Members*. Depending upon the degree of texturing, it may be necessary for the designer to compensate for the resulting loss of cross section.
- 2.3 Texturing will change the appearance grade specified. Additional voids and splintering may result. Textured surfaces will readily absorb stain, but adjacent areas of wood filler may not accept stain in the same manner. Eased edges will not normally be furnished.

3. FRAMING APPEARANCE GRADE

- 3.1 **APPLICATION** Framing grade is ordinarily suitable for construction in conventional framing applications such as windows and door headers where appearance is of no concern and the size of the glued laminated timber matches the size of the framing.
- 3.2 **DESCRIPTION**
 - 3.2.1 Laminations are permitted to possess the natural growth characteristics of the lumber grade.
 - 3.2.2 Voids appearing on the edge of laminations need not be filled.
 - 3.2.3 Loose knots and open knot holes in the wide face of laminations exposed to view need not be filled. Gaps in edge joints appearing on the wide face of laminations exposed to view need not be filled.
 - 3.2.4 Members are required to be surfaced "hit or miss" on two sides only to match conventional framing sizes. The following appearance requirements apply only to these two sides. Misses and low laminations are permitted. The maximum area of low laminations shall not exceed 25% of the surface area of a side. Wane (limited to a maximum of 1/4 in. measured across the width) is permitted on a cumulative basis. The accumulative depth of hit or miss and wane shall not exceed 10% of the width of the member at any glue line. The frequency of occurrence shall not exceed one in 10 pieces of lumber used.
 - 3.2.5 In accordance with the provisions in 3.2.4, wane (limited to 1/4 in. measured across the width) is permitted in all combinations and is not limited in length. Occasional wane approximately one foot in length and not exceeding the permissible depth of a low lamination shall be permitted in all combinations without regard to the cumulative effects indicated in 3.2.4. Wane permitted in specific laminating combinations up to 1/6 the lumber width on each side is not limited in length.

- 3.2.6 Hit or miss surfaces may change the net finished sizes and tolerances given in AITC 113, *Standard for Dimensions of Glued Laminated Structural Members*, and ANSI/AITC A190.1. Depending upon the degree of hit or miss, it may be necessary for the designer to compensate for the resulting loss of cross section.

4. INDUSTRIAL APPEARANCE GRADE

- 4.1 APPLICATION** Industrial appearance grade is ordinarily suitable for construction in industrial applications, warehouses, garages, and for other uses where appearance is not of primary concern.

4.2 DESCRIPTION

- 4.2.1 Laminations are permitted to possess the natural growth characteristics of the lumber grade.
- 4.2.2 Voids appearing on the edge of laminations need not be filled.
- 4.2.3 Loose knots and open knot holes in the wide face of laminations exposed to view shall be filled. This restriction does not apply for glued laminated timber truss members. Gaps in edge joints appearing on the wide face of laminations exposed to view need not be filled.
- 4.2.4 Members are required to be surfaced on two sides only. The following appearance requirements apply only to these two sides. Occasional misses, low laminations or wane (limited to a maximum of 1/4 in. measured across the width) are permitted on a cumulative basis. The cumulative depth of the misses, low laminations and wane shall not exceed 10% of the width of the member at any glue line. The frequency of occurrence shall not exceed one in 10 pieces of lumber used. The maximum area of low laminations shall not exceed 5% of the surface area of a side; and no more than two low laminations shall be adjacent to one another.
- 4.2.5 In accordance with provisions in 4.2.4, wane (limited to 1/4 in. measured across the width) is permitted in all combinations and is not limited in length. Wane permitted in specific laminating combinations up to 1/6 the lumber width on each side is not limited in length. Occasional wane approximately one foot in length and not exceeding the permissible depth of a low lamination shall be permitted in all combinations without regard to the cumulative effects indicated in 4.2.4. Wane permitted in specific laminating combinations up to 1/6 the lumber width on each side is not limited in length.

5. ARCHITECTURAL APPEARANCE GRADE

- 5.1 APPLICATION** Architectural appearance grade is ordinarily suitable for construction where appearance is an important requirement.

5.2 DESCRIPTION

- 5.2.1 Laminations are permitted to possess the natural growth characteristics of the lumber grade.
- 5.2.2 In exposed surfaces, voids measuring over 3/4 in. shall be filled by the fabricator with a wood-tone colored filler which reasonably blends with the final product or with clear wood inserts selected for similarity to the grain and color of the adjacent wood.
- 5.2.2.1 For appearance grading purposes, measurement of voids shall be in the direction of the length of the lamination and shall not exceed 3/4 in. except that a void may be longer than 3/4 in. if its area does not exceed 1/2 sq. in. Void measurement limitations apply only to the surfaces of the member exposed in the final structure. All characteristics shall be considered with respect to their effects on general appearance.
- 5.2.3 The wide face of laminations exposed to view shall be free of loose knots. Open knot holes shall be filled. Voids greater than 1/16 in. wide in edge joints appearing on the wide face of laminations exposed to view shall be filled.
- 5.2.4 Exposed faces shall be surfaced smooth. Misses and wane are not permitted.
- 5.2.5 The corners of the member exposed to view in the final structure shall be eased with a minimum relief of 1/8 in. Other dimensions for eased edges may be agreed upon between buyer and seller.

6. PREMIUM APPEARANCE GRADE

- 6.1 APPLICATION** Premium appearance grade is the highest standard appearance grade.

6.2 DESCRIPTION

- 6.2.1 Laminations are permitted to possess the natural growth characteristics of the lumber grade.

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- 6.2.2 In exposed surfaces, voids shall be filled by the fabricator with a wood-tone colored filler that reasonably blends with the final product or with clear wood inserts selected similarity to the grain and color of the adjacent wood.
- 6.2.3 The wide face of laminations exposed to view shall be selected for appearance and shall be free of loose knots. Voids shall be filled. Knot size shall be limited to 20% of the net face width of the lamination. Not over two maximum size knots or their equivalent shall occur in a 6 ft length. Voids greater than 1/16 in. wide in edge joints appearing on the wide face of laminations exposed to view shall be filled.
- 6.2.4 Exposed faces shall be surfaced smooth. Misses and wane are not permitted.
- 6.2.5 The corners of the member exposed to view in the final structure shall be eased with a minimum relief of 1/8 in. Other dimensions for eased edges may be agreed upon between buyer and seller.

7. SPECIAL APPEARANCE REQUIREMENTS

- 7.1 For special applications, the buyer may specify other requirements. Such requirements may limit availability.

8. SUMMARY OF APPEARANCE GRADE SPECIFICATIONS

Description Item	Framing Appearance Grade	Industrial Appearance Grade	Architectural Appearance Grade	Premium Appearance Grade
Natural growth characteristics of lumber grade Paragraph reference	Allowed 3.2.1	Allowed 4.2.1	Allowed 5.2.1	Allowed 6.2.1
Filling of voids on edge of laminations Paragraph reference	Not required 3.2.2	Not required 4.2.2	Required for voids over 3/4 in. 5.2.2, 5.2.2.1	Required for all voids 6.2.2
Wide face of laminations exposed to view Paragraph reference	Loose knots, open knot holes permitted 3.2.3	Void filling required except for trusses 4.2.3	Free of loose knots, void filling required 5.2.3	Selected for appearance, free of loose knots, void filling required, knot sizes limited 6.2.3
Edge joints appearing on wide faces of laminations exposed to view Paragraph reference	Filling not required 3.2.3	Filling not required 4.2.3	Filling required for voids over 1/16 in. wide 5.2.3	Filling required for voids over 1/16 in. wide 6.2.3
Surfacing of sides Paragraph reference	Required "Hit or Miss", Low laminations permitted. Limited amount of wane permitted 3.2.4, 3.2.5	Required. Limited amounts of misses, low laminations and wane permitted. 4.2.4, 4.2.5	Required. Misses not permitted 5.2.4	Required. Misses not permitted 6.2.4
Surfacing of wide face of laminations exposed to view Paragraph reference	Not required 3.2.4	Not required 4.2.4	Required. Misses not permitted 5.2.4	Required. Misses not permitted 6.2.4
Eased edges Paragraph reference	Not required —	Not required —	Required 5.2.5	Required 6.2.5