

APA

How to Specify Engineered Wood Products



Presented by Warren Hamrick

Webinar Attendee Survey








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<https://www.apawood.org/apa-ww-survey>

APA

Who is APA – The Engineered Wood Association?

APA represents approximately 175 member mills in 23 states and seven provinces.

- Voice of industry
- Mark of quality
- Technical support
- Free education
- Research
- Non-profit organization
- HQ in Tacoma, WA
- www.apawood.org

The leading resource for information about engineered wood products.

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What are Engineered Wood Products

Engineered Wood
Any wood-based building material that has been improved physically by a man-made process.

What Are Engineered Wood Products?

Panel Products

- **WSP – Wood Structural Panels**
 - Plywood
 - OSB – Oriented Strand Board
- **Siding**
- **Specialty Panels**
 - Radiant Barrier
 - Formwork
 - Industrial Panels
 - Overlaid Panels
 - APA OSB used as fire rated sheathing

What Are Engineered Wood Products?

Framing Products

- I-Joists
- SCL – Structural Composite Lumber
 - PSL – Parallel Strand Lumber
 - LVL – Laminated Veneer Lumber
 - LSL – Laminated Strand Lumber
 - OSL – Oriented Strand Lumber
- Glulam – Glued Laminated Timber



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What Are Engineered Wood Products?



**Framing Product...
or Panel Product**

- CLT – Cross-Laminated Timber




Advantages of EWP

- ✓ Sustainable
- ✓ Predictable
- ✓ Performance
- ✓ Less Waste


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Panel Products



Alternating Layer Direction
Moisture-Resistant Adhesive
Wet and Dry Structural Performance Tests
Available in Exterior and Structural I Grade

Plywood v. OSB
Veneers v. Flakes
Prescriptive Standard v. Performance Standard



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Manufacturing Standards




PS 1: Voluntary Product Standard
PRESCRIPTIVE Standard (revised 2020)


PS 2: Voluntary Product Standard
PERFORMANCE Standard (revised 2019)




Panel Products

Siding and Specialty Panels

- Siding
- Specialty Panels
 - Radiant Barrier
 - APA Plyform®
 - Industrial Panels
 - Overlaid Panels



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Framing Products

Framing Products

- I-Joists
- SCL – Structural Composite Lumber
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I-Joist Advantages

Engineered design = More efficient

Wood placed
where stresses
are greatest

- 46% less than lumber at 16" vs. I-joist at 19.2"
- 36% less when both are at 16"

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Rim Board

Various EW products used as a rim board and typical thickness:

- ❑ Glulam (typ. 3-1/2")
- ❑ LSL (typ. 1-1/8", 1-1/4", 1-1/2", 1-3/4", 3-1/2")
- ❑ LVL (typ. 1-1/4", 1-1/2", 1-3/4", 3-1/2")
- ❑ OSB (typ. 1", 1-1/8")
- ❑ OSL (typ. 1-1/4", 1-3/4")

Use 100% EWP in the floor system. Do not use a mix of sawn lumber with EWP because shrinkage and dimensional differences can be problematic.

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Engineered Floor Systems

Engineered design = Better systems
Flatter surfaces, stronger, quieter floors, fewer problems

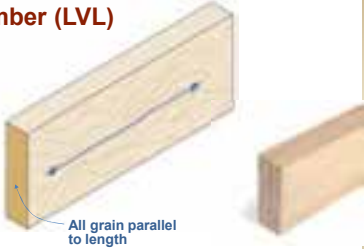



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Structural Composite Lumber

Laminated Veneer Lumber (LVL)

- Common uses
 - Beams
 - Headers
 - Rafters
 - Scaffold planking



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Structural Composite Lumber

Laminated Strand Lumber (LSL)

- Flaked strand length-to-thickness ratio is around 150
- Common uses: studs and headers

Oriented Strand Lumber (OSL)

- Flaked strand length-to-thickness ratio is around 75
- Common uses: studs



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Glued Laminated Timbers (Glulam)

Dimension lumber laminations

- Wood laminations bonded together
- Wood grain runs parallel to the length
- May or may not be homogeneous
- Common uses: beams, headers and columns



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High Strength Glulam Beams

LVL Hybrid Glulam with LVL Outer Laminations

- Full length with no finger joints required
- LVL has greater tensile strength compared to lumber
- 30F-2.1E stress level achieved
- Direct substitute for many SCL products

LVL Laminations



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CLT

Cross-Laminated Timber (CLT)

- Applications: long span walls, floors, roof panels
- Typical Sizing: 2-10' wide, ≤ 60' lengths, ≤ 20" thicknesses
- Publications: 2018 IBC, 2018 NDS, ANSI/APA PRG 320



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CLT Panels

Cross-laminated timber (CLT) is a large-scale, prefabricated, solid engineered wood panel.

- Lightweight & strong
- Excellent acoustic, fire, seismic and thermal performance
- Easy to install
- Little site waste
- Green product & Biophilia effect
- Alternative to concrete, masonry or steel



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Code Recognized

Proprietary vs Non-Proprietary

- | | |
|---|--|
| <ul style="list-style-type: none"> ▪ Lab Tested ▪ ES Reports ▪ I-Joists ▪ Structural Composite Lumber (SCL) | <ul style="list-style-type: none"> ▪ Lab Tested ▪ Code Design Values ▪ Plywood ▪ Oriented Strand Board ▪ Glulam ▪ Cross-Laminated Timber (CLT) |
|---|--|



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APA Specification Resources

APA Engineered Wood Construction Guide, Form E30


- Free PDF download
- Nominal cost for hard copy
- The single “go to” document for all engineered wood products
- www.apawood.org



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Panel Specifications

- Refer to APA Engineered Wood Construction Guide, Form E30
 - OSB
 - Plywood
 - Concrete Formwork
 - Exposure 1 vs Exterior explained




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Panel Specifications



FYI:

- ✓ Instead of OSB or Plywood consider **“Wood Structural Panel”**
- ✓ Use the wording **“Panel Performance Category”** rather than exact panel thickness (for example 3/4”)
- ✓ Just say “NO” to “CDX”. Instead use **“rated sheathing”**



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APA Performance Panels

When specifying panels, designate: grade, span rating, bond classification, dimensions (thickness, width x length), edge, APA trademark.

Out of Date Specifications


- 1/2" CDX - C & D veneers, with exterior glue (when panels were made with interior & exterior glue)

Previous Specifications

- 15/32" APA Rated Sheathing, 32/16, Exposure 1

New Terminology www.apawood.org/apa-trademark

- 15/32 Performance Category, APA Rated Sheathing, 32/16, Exposure 1, nominal 4'x8' (either T&G for tongue and groove or square edge)



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Bond Classification

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RATED SHEATHING
24/16

DESIGNED FOR SPACING
EXPOSURE 1
THICKNESS 0.418 IN.

900

PS 2-18 SHEATHING
PER-108 AVAILABLE AS
TN CATEGORY

OR

Bond
Classification

APA

RATED SHEATHING
STRUCTURAL I
48/24

DESIGNED FOR SPACING
EXTERIOR
THICKNESS 0.70 IN.

900

PS 1-18 S.C. PER-108
TN CATEGORY

Bond Classification

EXPOSURE 1

J

Exposure due to
active construction

OR

EXTERIOR

Long term weather
exposure

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Panel Specifications

Consider adding to specs.:

- 1/8" gap all panel edges
- Fasteners 3/8" from panel edges
- Wet weather installation

Refer to APA Publications:
X501 – Questions on Panel...Moisture...
D481 – TN Minimizing Buckling of WSP

APA Stamp in the Field

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Glulam Specifications

- **Refer to:**
 - APA Engineered Wood Construction Guide, Form E30
 - ANSI A190.1-2022: Product Standard for Structural Glued Laminated Timber

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Glulam Specifications

Glulam Beam Combination Symbols

1. Allowable Design Stress
2. Appearance Classification
3. Grading = Visual (V) or Mechanical (E)
4. Assigned combination number of lumber used to assign the design stresses
 - Shear, Modulus of Elasticity, etc.
5. Wood Species: Commonly DF or SP

Common Beam Combinations:

- 24F-V4/DF or 24F-V8/DF – $F_{bx} = 2,400$ psi, or Combination 2/DF – $F_{bx} = 1,700$ psi
- 24F-V3/SP or 24F-V5/SP – $F_{bx} = 2,400$ psi, or Combination 47/SP – $F_{bx} = 1,400$ psi
- High strength 30F-E1/SP or 30F-E2/SP – $F_{bx} = 3,000$ psi

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Glulam Specifications

APA
24F-V4
BACK UNBALANCED G/L ANS I 11
PROOF LOADED END JOINTS
MILL 8009 ANS I A 190.1-2022

Glulam Trademark

1. Combination symbol
2. Unbalanced layup
3. The species or species group of lumber used
4. Designation of appearance classification
5. Applicable design and manufacturing specification
6. Indicates the member has the required laminations proof loaded
7. Mill number
8. Identification of ANSI A190.1, *Standard for Wood Products – Structural Glued Laminated Timber*.

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SCL Specifications

- **Refer to:**
 - APA Form E30
 - Proprietary manufacturer published specifications
- **SCL Includes:**
 - LVL
 - LSL
 - OSL
 - PSL

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1100F-2.5E
ANSI A 190.1-2022
MILL 8009

Structural Composite Lumber (SCL) Specification Guide

1. Back Unbalanced Layup
2. Proof Loaded End Joints
3. Mill Number
4. Identification of ANSI A190.1, *Standard for Wood Products – Structural Glued Laminated Timber*.

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I-Joist Specifications

- **Refer to:**
 - APA Form E30
 - APA PRI-400 (residential)
 - APA PRI-405 (commercial)
 - Proprietary manufacturer published specifications

APA
1100F-2.5E
ANSI A 190.1-2022
MILL 8009

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CLT Specifications

- Refer to:
 - APA Form E30
 - ANSI/APA PRG 320 (basic CLT grades)
 - APA Product Reports (custom CLT grades)



Cross-Laminated Timber (CLT) Specification Guide

A. General

CLT shall be manufactured in accordance with the requirements established in the CLT specification as well as the governing building code(s) by the engineer of record. Reproduction details shall be in accordance with the engineering drawing.

B. Manufacturers

1. **Materials (Manufacturers and Quality Assurance)** - Product quality shall conform to ANSI/APA PRG 320 Standard for Performance-Rated Cross-Laminated Timber.


2. **Manufacturers** - CLT products conforming to ANSI/APA PRG 320 Standard for Performance-Rated Cross-Laminated Timber shall be marked with CLT grade, CLT Engineer of Record, mill name or identification number, and mill identification number by affixing and embossing the APA Form E30 or ANSI/APA PRG 320. The top face of marked CLT panels will contain a laser-etched mill mark or shall be marked with "E30" stamp.

3. **Protection of shipment** - Materials shall be protected with a cover system conforming to standard.

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APA Product Reports

- Report indicates that product meets the intention of the listed codes when used as stated and within the specified limitations.
- Design properties are included.
- Available for download at www.apawood.org



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Engineered Wood: A Green Choice

www.apawood.org/green-verification-reports

APA Green Verification Report

Engineered Wood Product GR-L000
 Engineered Wood Manufacturing
 Engineered Wood Manufacturing
 1111 S. First Avenue
 Woodtown, Ontario XXX111
www.EngineeredWoodManufacturing.com

1. **Product** - Engineered Wood Product (EWP) - GR-L000
 2. **Manufacturer** - Engineered Wood Manufacturing (EWM)
 3. **Product Description** - Engineered Wood Product (EWP) - GR-L000
 4. **Product Description** - Engineered Wood Product (EWP) - GR-L000
 5. **Product Description** - Engineered Wood Product (EWP) - GR-L000
 6. **Product Description** - Engineered Wood Product (EWP) - GR-L000
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 9. **Product Description** - Engineered Wood Product (EWP) - GR-L000
 10. **Product Description** - Engineered Wood Product (EWP) - GR-L000

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