How to Specify Engineered Wood Products

Presented by Warren Hamrick

Webinar Attendee Survey

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

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.
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

What Are Engineered Wood Products?

Framing Product…
or Panel Product
- CLT – Cross-Laminated Timber

Advantages of EWP
- Sustainable
- Predictable
- Performance
- Less Waste
Panels 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

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
Framing Products

- I-Joists
- SCL – Structural Composite Lumber
  - LVL – Laminated Veneer Lumber
  - LSL – Laminated Strand Lumber
  - OSL – Oriented Strand Lumber
  - PSL – Parallel Strand Lumber
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I-Joist Advantages

Engineered design = More efficient

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

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”, 3-1/4”, 3-1/2”)
- OSL (typ. 1”, 1-1/8”)
- OSB (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.
Engineered Floor Systems

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

Structural Composite Lumber

Laminated Veneer Lumber (LVL)
- Common uses
  - Beams
  - Headers
  - Rafters
  - Scaffold planking

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
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

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

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
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

Code Recognized

Proprietary vs Non-Proprietary
- Lab Tested
- ES Reports
- I-Joists
- Structural Composite Lumber (SCL)
- Lab Tested
- Code Design Values
- Plywood
- Oriented Strand Board
- Glulam
- Cross-Laminated Timber (CLT)

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
Panel Specifications

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

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"

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)
Bond Classification

EXPOSURE 1
- Exposure due to active construction

EXTERIOR
- Long term weather exposure

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

Glulam Specifications

- Refer to:
  - APA Engineered Wood Construction Guide, Form E30

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

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

SCL Specifications

- Refer to:
  - APA Form E30
  - Proprietary manufacturer published specifications

- SCL Includes:
  - LVL
  - LSL
  - OSL
  - PSL

I-Joist Specifications

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

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

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

Engineered Wood: A Green Choice

www.apawood.org/green-verification-reports
Go to www.apawood.org/newsletters
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Follow instructions for newsletter sign up
Registering gives you access to APA publications, webinars and newsletters

Thank you!

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