

Overview of Engineered Wood Products



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Quality Services

Technical Services

Field Services

Marketing Communications

Agenda

- What are Engineered Wood Products?
- Why Engineered Wood Products?
- Manufacturing Engineered Wood Products
- Recognize appropriate applications (uses) for each



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



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



Why Engineered Wood Products?

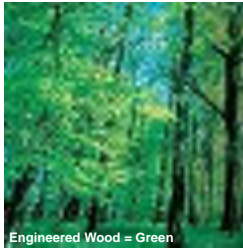
- ✓ Sustainability
- ✓ Predictable
- ✓ Performance
- ✓ Less Waste



Why Engineered Wood Products?

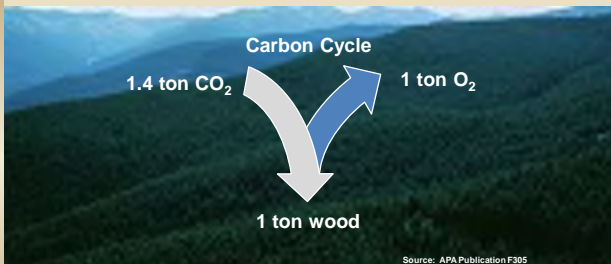
Sustainability

- Produced from small dimension lumber harvested from managed and sustainable forests
- Timber resource utilization optimized using a wide range of lumber grades
- Uses a wide variety of species
- Manufacturing involves low energy use process
- Uses low formaldehyde emitting adhesives



Engineered Wood = Green

Why Engineered Wood Products?



Why Engineered Wood Products?

Predictable

- Consistent dimensions
- Straight
- Predictable
- Less Shrinkage
- Less Crowning
- Long Lengths



Why Engineered Wood Products?

Performance

- Longer lengths and stronger members



Why Engineered Wood Products?

Less waste

- Longer lengths cut to size to reduce jobsite waste
- Engineered wood products are a system



Manufacturing Engineered Wood Products

Engineered Wood

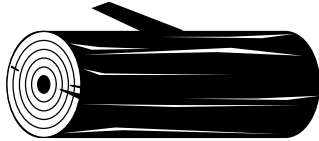
Any wood-based building material that has been improved physically by a man-made process.



Manufacturing Engineered Wood Products

Six Steps:

1. Take the log apart
2. Sort the pieces
3. Apply adhesive
4. Arrange the pieces
5. Press/Cure
6. Finishing touches



Manufacturing Engineered Wood Products

Machined into pieces...

- Sawing
 - Glulam
 - CLT
- Peeling
 - Plywood
 - LVL
 - PSL
- Slicing
 - OSB
 - LSL
 - OSL



Manufacturing Engineered Wood Products

Processed for maximum strength by:

- Drying
- Sorting
- Grading
- Aligning



Manufacturing Engineered Wood Products

Manufactured by...

- Applying Adhesives
- Pressing
- Curing
- Finishing



Panel Products

Plywood v. OSB

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

Veneers v. Flakes
Prescriptive Standard v. Performance Standard



Panel Products

Siding and Specialty Panels

- Siding
- Specialty Panels
 - Radiant Barrier
 - Formwork
 - Industrial Panels
 - Overlaid Panels



Framing Products

Framing Products

- I-Joists
- SCL – Structural Composite Lumber
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 - PSL – Parallel Strand Lumber
- Glulam – Glued Laminated Timber



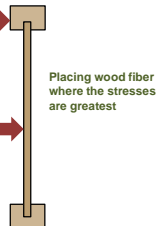
Wood I-Joist Anatomy

Flange

Typically LVL (peeled, dried, aligned, glued, pressed) or MSR lumber (sawn, dried, sorted, graded)

Web

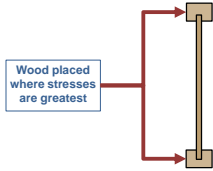
Typically OSB (sliced, dried, aligned, glued, pressed)



I-Joist Advantages

Engineered design = More Efficient

- Utilizes the wood fiber where needed for strength minimizing use of wood fiber



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



Wood I-Joist



Standard Depths

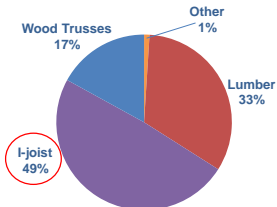
- 9-1/2"
- 11-7/8"
- 14"
- 16"
- 18"

- Varied flange widths and depths
- Structural performance varies by manufacturer



Engineered Wood Floors

Nearly 50 Percent of Raised Floor Systems



From Home Innovations Research Labs, 2013 Builder Practices Survey



Framing Products



APA

Fire Protection

- Webinar: Fire Protective Assemblies for Wood I-Joist Floors
- www.apawood.org/i-joist-fire-assemblies
- Publications
- *Designing to Meet IRC Fire Protection Provisions for I-Joist Floor Systems, Form R425*
- *APA System Report: Fire Protection of Floors Constructed with Prefabricated Wood I-Joists Form SR-405*
- CAD Details
- www.apacad.org/cad-details?f=Fire+Rated+Systems

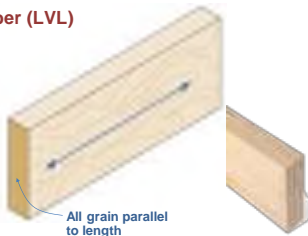


APA

Structural Composite Lumber

Laminated Veneer Lumber (LVL)

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



All grain parallel to length

APA

Structural Composite Lumber



Laminated Veneer Lumber (LVL)

- **Standard Depths**
 - 9-1/2"
 - 11-7/8"
 - 14"
 - 16"
 - 18"
- **Common thicknesses**
 - 1-1/2"
 - 1-3/4"
 - 3-1/2"
 - 5-1/4"
 - 7"
- **Common stiffness ratings:**
 - 1.5E
 - 1.8E
 - 2.0E

Photo courtesy of Pacific Woodtech Corporation



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



Structural Composite Lumber

Laminated Strand Lumber (LSL) & Oriented Strand Lumber (OSL)

- **Standard depths**
 - 7-1/4"
 - 9-1/2"
 - 11-7/8"
 - 14"
 - 16"
- **Common stiffness ratings:**
 - 1.35E
 - & 1.55E
- **Common thicknesses**
 - 1-1/2"
 - 1-3/4"
 - 3-1/2"



Structural Composite Lumber

Parallel Strand Lumber (PSL)

- Manufactured from veneers clipped into long strands in a parallel formation and bonded together
- Strand length-to-thickness ratio is around 300
- Common uses: headers, beams, load-bearing columns
- Specs are published on a proprietary basis by the manufacturer and recognized in evaluation reports.



Structural Composite Lumber

Parallel Strand Lumber (PSL)

- **Standard Depths**
 - 9-1/2"
 - 11-7/8"
 - 14"
 - 16"
 - 18"
- **Common stiffness ratings:**
 - 2.0E
 - 2.1E
 - 2.2E
- **Common thicknesses**
 - 1-3/4"
 - 3-1/2"
 - 5-1/4"
 - 7"



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



Glued Laminated Timbers (Glulam)



Photo courtesy of Anthony Forest Products

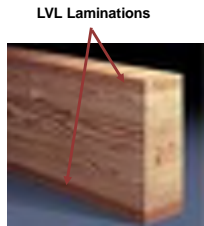
- **Standard Depths**
 - 9-1/2"
 - 11-7/8"
 - 14"
 - 16"
- **Common thicknesses**
 - 3-1/2"
 - 5-1/2"
 - 6-3/4"
- **Common stiffness ratings:**
 - 1.8E
- **Lengths up to 48'**



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



Glued Laminated Timbers (Glulam)

Fire-Retardant-Treated Structural Glued Laminated Timber

- APA Technical Topic TT-127 issued May 2020
- Joint pilot study
 - APA – The Engineered Wood Association
 - USDA Forest Products Laboratory
- Comparison of the bending properties of untreated Glulam and FRT glulam
- Use in Type III construction
- Research in Progress for FRT LVL



Floor Framing



Floor Framing



Floor Framing



Floor Beams



Roof Framing



Roof Framing



Headers



Garage Door Headers



Garage Door Headers



Wall Framing



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Headers



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Wall Framing



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Wall Framing



Photo courtesy of Weyerhaeuser Corporation

- Tall wall applications
- Headers
- Beams
- Columns
- Studs



Wall Framing



Code Recognized

Proprietary v. Non-Proprietary

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



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/publications



APA Resources

- Help Desk



APA Resources

- Help Desk
- Engineered Wood Specialist



www.apawood.org/staff-contacts

APA Resources

- Help Desk
- Engineered Wood Specialist
- Websites
 - www.apawood.org



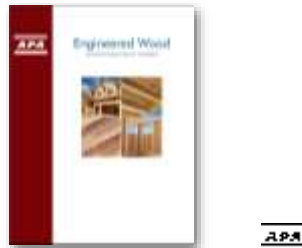
Wood Products Manufacturing

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Overview of Engineered Wood Products

Questions?

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Overview of Engineered Wood Products

Survey

