

LVL Product Literature For Manufactured/Factory Built Structures



MURPHY
Engineered Wood



**Uniform Finished Sizes
Engineered For Strength
Dimensionally Stable
Resists Warping and Twisting**

Combining superior customer service with premium quality engineered wood, Murphy Company produces LVL that is stronger, straighter, and more uniform than dimensional lumber. The process begins with Douglas fir of exceptional quality, from which graded veneer is layered with waterproof adhesives and coated with moisture resistant sealer. The end result is beams and headers with outstanding dimensional stability, uniformity, and durability.

Available Sizes:

Thickness: 1½" and 1¾"

Depths: 3½", 4", 4½", 4¾", 5", 5½", 7", 7¼", 7⅞", 9", 9¼", 9½", 9¾", 11¼", 11⅞", 14", 16", 18", 20", 22", 24"

Lengths: up to 72'-0"

Fastener Design

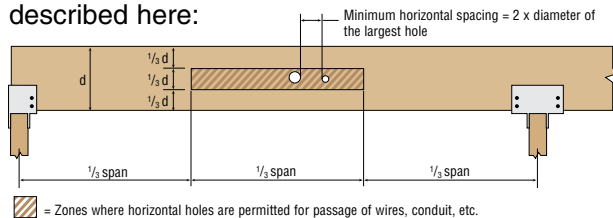
| Equivalent Specific Gravity (S.G.) | | | | |
|------------------------------------|-------------------|-------------------|-------------------|-------------------|
| Nails | | | | Bolts |
| Withdrawal Load | | Lateral Load | | Lateral Load |
| Installed in Edge | Installed in Face | Installed in Edge | Installed in Face | Installed in Face |
| 0.49 | 0.50 | 0.50 | 0.50 | 0.50 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lbf = 0.454 kg, 1 psi = 6.9 kPa.

1. Fastener values based on the equivalent specific gravities in the above table are for normal load duration and shall be permitted to be adjusted using the load duration factors in accordance with the code.
2. The bolt edge distance when loaded parallel and perpendicular to the grain shall be a minimum of four times the bolt diameter (4D).

Allowable Hole Detail

LVL may only be cut drilled or cut in the manner described here:



Hole Size Limits: No round holes larger than 2" in diameter.

Notes:

1. For beam depth of 3½", 5½", and 7¼ inches, the maximum hole diameter is ¾", 1⅛", and 1½ inches, respectively.
2. For deeper beams, the maximum hole diameter is 2 inches.
3. The maximum number of holes for each span is limited to 3.
4. Holes should not be cut in cantilevers.

Allowable Design Stresses

| | | 1.8E - 2750 F _b | 2.0E - 2950 F _b | 2.0E - 3100 F _b |
|---|-----------------------------|----------------------------|----------------------------|----------------------------|
| Bending (psi) | F _b ² | 2750 | 2950 | 3100 |
| Longitudinal Shear (psi) | F _v | 285 | 290 | 290 |
| Modulus of Elasticity (lb-in ²) | E | 1.8x10 ⁶ | 2.0x10 ⁶ | 2.0x10 ⁶ |
| Compression Perpendicular to Grain (psi) | F _{c⊥} | 750 | 750 | 750 |
| Compression Parallel to Grain (psi) | F _c | 2350 | 3200 | 3200 |
| Tension Parallel to Grain (psi) | F _t ³ | 1950 | 2100 | 2100 |

1. Values are based on normal temperatures, dry conditions and 100% load duration and may be increased in accordance with the NDS.
2. F_b must be adjusted by the depth effect formula: (12/d)^{0.18} where d = depth (in)
3. F_t must be adjusted by the length effect: (3/l)^{0.11} where l = length (ft)

Minimum Nail Spacing

for nails installed parallel to the glue-line

| Nail Size | Single Row | Multiple Rows ¹ |
|------------------|------------|----------------------------|
| 8d Common (2½") | 3" | 4" |
| 10d Common (3") | 4" | 5" |
| 12d Common (3¼") | 4" | 5" |
| 16d Common (3½") | 5" | 6" |

1. Offset multiple rows ½" and stagger nails on equal-equal layout
2. Minimum nail spacing may be reduced to 5" for 1¾" wide members
3. Nail penetration shall not exceed 2½" for 10d and 12d nor 2" for 16d



Allowable Design Properties (100% Duration)

| Product | Thickness | | Depth (in) | | | | | | | | | | | | | | | | | | | | |
|----------------------------|-----------|--------------------------|------------|------|------|------|------|------|------|------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| | | | 3½" | 4" | 4½" | 4¾" | 5" | 5½" | 7" | 7¼" | 7½" | 9" | 9¼" | 9½" | 9¾" | 11¼" | 11½" | 14" | 16" | 18" | 20" | 22" | 24" |
| 2.0E - 3100 F _b | 1-1/2" | Moment (ft-lbs) | 988 | 1259 | 1560 | 1805 | 1890 | 2248 | 3487 | 3717 | 4321 | 5509 | 5791 | 6079 | 6373 | 8269 | 9124 | 12312 | 15699 | 19452 | 23564 | 28027 | 32837 |
| | | Shear (lbs) | 1015 | 1160 | 1305 | 1414 | 1450 | 1595 | 2030 | 2103 | 2284 | 2610 | 2683 | 2755 | 2828 | 3263 | 3444 | 4060 | 4640 | 5220 | 5800 | 6380 | 6960 |
| | | EI (lb-in ²) | 10.7 | 16 | 22.8 | 29 | 31.2 | 41.6 | 85.8 | 95.3 | 122.1 | 182.3 | 198 | 214.3 | 231.7 | 356 | 418.6 | 686 | 1024 | 1458 | 2000 | 2662 | 3456 |
| | | Weight (plf) | 1.4 | 1.6 | 1.8 | 1.9 | 2.0 | 2.1 | 2.7 | 2.8 | 3.1 | 3.5 | 3.6 | 3.7 | 3.8 | 4.4 | 4.6 | 5.5 | 6.3 | 7.0 | 7.8 | 8.6 | 9.4 |

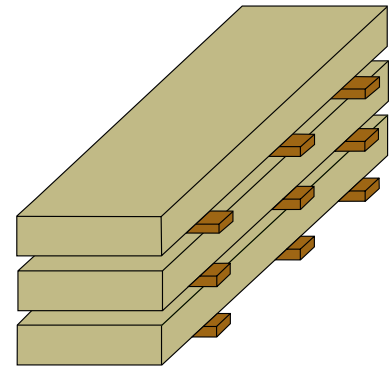
| Product | Thickness | | Depth (in) | | | | | | | | | | | | | | |
|----------------------------|-----------|--------------------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| | | | 5½" | 7" | 7¼" | 9" | 9¼" | 9½" | 9¾" | 11¼" | 11½" | 14" | 16" | 18" | 20" | 22" | 24" |
| 2.0E - 3100 F _b | 1-3/4" | Moment (ft-lbs) | 2623 | 4068 | 4336 | 6427 | 6756 | 7092 | 7435 | 9648 | 10645 | 14364 | 18315 | 22694 | 27491 | 32699 | 38309 |
| | | Shear (lbs) | 1861 | 2368 | 2453 | 3045 | 3130 | 3214 | 3299 | 3806 | 4018 | 4737 | 5413 | 6090 | 6767 | 7443 | 8120 |
| | | EI (lb-in ²) | 48.5 | 100.0 | 111.1 | 212.6 | 230.8 | 250.1 | 270.3 | 415.3 | 488.4 | 800.3 | 1194.7 | 1701.0 | 2333.3 | 3105.7 | 4032.0 |
| | | Weight (plf) | 2.8 | 3.6 | 3.7 | 4.6 | 4.7 | 4.8 | 5.0 | 5.7 | 6.1 | 7.1 | 8.2 | 9.2 | 10.2 | 11.2 | 12.3 |

1. Values are based on normal temperatures, dry conditions and 100% load duration and may be increased in accordance with the NDS.



Handling & Storage Guidelines

- LVL should be protected from the weather and stored lying flat.
- Product must not be stored in contact with the ground.
- Store LVL in wrapped bundles. Provide air circulation and support bundles with 2x4 stickers.
- Protect from the weather on the job site both before and after installation. LVL is intended for use in covered, dry conditions only.
- Except as described in this product guide, LVL should not be cut, drilled or notched.
- Do not install wet or visually damaged product.



Responsible Manufacturing Practices

Murphy LVL is certified and approved under strict quality control methods established by the APA EWS, and will perform to the design stresses and strength properties outlined in the APA Product Report. Murphy LVL must be selected, purchased, handled, and installed in accordance with our guidelines and the applicable building codes for the product to be warranted for its expected life. The raw materials that comprise this LVL product are conscientiously procured from smaller trees for more efficient utilization of wood fiber resources and to promote the principles of Sustainable Forest Management.



MURPHY
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412 West Central Ave.
Sutherlin, OR
97479

OFFICE 541.459.4545
FAX 541.459.4546
www.murphyplywood.com