

LP[®] SOLIDSTART[®] OSB & LSL RIM BOARD

U.S. (ASD) TECHNICAL GUIDE

APA Rated OSB and 1.35E LSL

LP SolidStart[®]
ENGINEERED WOOD



Product Specifications & Design Values

LP® SOLIDSTART® RIM BOARD

An integral part of LP's framing package, OSB and LSL Rim Board from LP Engineered Wood Products provides strong, cost-effective solutions to your framing needs. Designed to match our LP SolidStart I-Joists, they are available in several depths and thicknesses. LP's SolidStart Rim Board offers straightforward and quick installation as well as high-strength reliability.

THE ROLE OF RIM BOARD IN A BUILDING

LP SolidStart Rim Board fills the space between the sill plate and the bottom wall plate, or between the top plate and bottom plate in multi-story construction. In addition to filling the void, rim board is an integral structural component that transfers both lateral and vertical forces. To function properly, rim board must match the depth of framing members. Traditional solid sawn lumber typically does not match engineered wood I-Joists, which is why LP SolidStart Rim Board is a perfect choice. Even for seemingly similar depths, lumber can shrink leaving it shorter than the I-Joist and useless.

WHAT MAKES LP SOLIDSTART RIM BOARD DIFFERENT?

LP SolidStart Rim Board is more convenient to use than field ripped rim because it is precision cut to match the depths of LP SolidStart I-Joists and is manufactured in standard lengths of 16' and 20'. Here are just a few of the benefits:

Trouble-Free Workability

- Easy to saw, drill, plane, file or sand with normal carpentry tools
- I-Joist compatible depths save time on the job-site
- Flat surfaces for easy installation of siding
- Precut depths means less inaccuracies and time involved in ripping in the field

Just The Right Size

- LP SolidStart LSL may be available in longer lengths
- I-Joist compatible depths for a perfect match

Fire Blocking

- 1" or thicker LP SolidStart Rim Board can be used as an alternate to 23/32" wood structural panel fire blocking
- 1-1/4" or thicker LP Rim Board can be used as an alternate to nominally 2" lumber fire blocking

SPECIFIED RIM BOARD WEIGHTS (PLF)								
Type	Thickness	Rim Board Depth						
		9-1/2"	11-7/8"	14"	16"	18"	20"	24"
LP OSB	1"	2.6	3.2	3.8	4.3	4.9	5.4	6.5
	1-1/8"	2.9	3.6	4.3	4.9	5.5	6.1	7.3
LP LSL	1-1/4"	3.6	4.5	5.3	6.1	6.9	7.6	9.2
	1-1/2"	4.4	5.4	6.4	7.3	8.3	9.2	11.0

MATERIALS & FABRICATION

LP offers two types of rim board: LP SolidStart OSB Rim Board, fabricated from oriented strand board, and LP SolidStart LSL Rim Board, from Laminated Strand Lumber (LSL). Both types are precision cut to match the depths of LP SolidStart I-Joists.

The type of rim board you choose will depend on your specific project. OSB rim board comes in smaller thicknesses and is perfect for lower lateral load applications. Use LSL rim board where loads are higher such as in commercial and multi-family structures.

BEAM & HEADER STOCK AS RIM BOARD

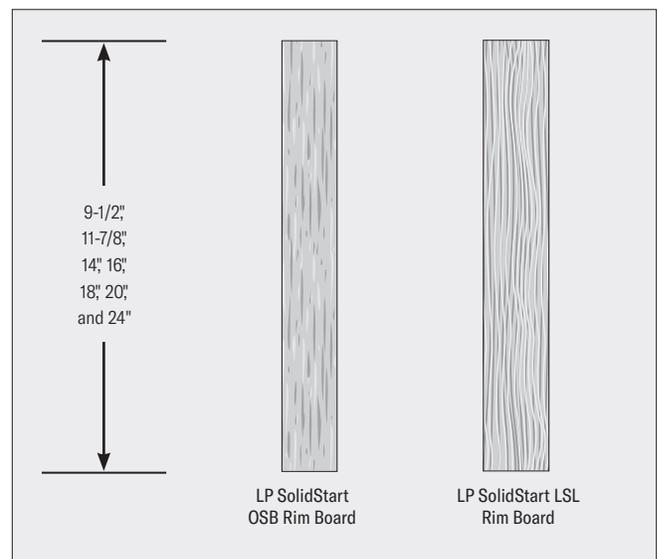
While standard LP LSL may appear to be suited for use as rim board, there are several reasons why it may not be the best choice, including different tolerances on the finished depth and labeling requirements:

- Rim Board products are ripped slightly taller than an I-Joist to ensure that all vertical load is transferred through the rim board rather than through the I-Joist.
- The thickness of rim board is stamped on the product for easy visual confirmation by a building inspector.

LIFETIME LIMITED WARRANTY

LP SolidStart Engineered Wood Products are backed by a lifetime limited warranty. Visit LPCorp.com or call 1.888.820.0325 for a copy of the warranty.

LP SOLIDSTART RIM BOARD PROFILES



Product Specifications & Design Values

RIM BOARD CAPACITIES

Material	Grade	Thickness	Vertical Load Capacity ¹			Lateral ^{4,5,6} Load Capacity (plf)
			Uniform ² (plf)		Concentrated ³ (lbs)	
			d ≤ 16"	16" < d ≤ 24"	d ≤ 24"	
LP OSB	APA C2/Rim Board ⁷	1"	3300	1650	3500	180
	APA C1/Rim Board ⁷	1-1/8"	4400	3000	3500	180
LP LSL	1.35E	1-1/4"	6000	3800	3800	250
		1-1/2"	7000	4500	4500	280

NOTES:

- The Vertical Load Capacity shall not be increased for short-term load duration.
- The Uniform Vertical Load Capacity is based on the capacity of the rim board and may need to be reduced based on the bearing capacity of the supporting wall plate or the attached floor sheathing. Example: The allowable bearing stress for commodity floor sheathing is 360 psi so the bearing capacity of a 1-1/4" x 16" deep rim board would be limited to 5400 plf (360 psi x 1-1/4" x 12).
- The Concentrated Vertical Load Capacity is assumed to be applied through a minimum 4-1/2" bearing length (3-stud post).
- The Lateral Load Capacity is based on a short-term load duration and shall not be increased.
- The Lateral Load Capacity is based on the connections specified in the Installation details on page 4.
- Additional framing connectors fastened to the face of the rim board may be used to increase lateral capacity for wind and seismic design.
- The APA C1 and C2 grades in product standard ANSI/APA PRR 410-2011 are equivalent to the rim board grade in product standard APA PRR-401.

ALLOWABLE UNIFORM LOADS (PLF) FOR RIM BOARD HEADERS: MAXIMUM 4' CLEAR SPAN

Material	Thickness	Rim Board Depth			
		9-1/2"	11-7/8"	2-Ply 14"	2-Ply 16"
LP OSB	1"	330 (1-1/2")	480 (3")	1280 (3")	1670 (4-1/2")
	1-1/8"	370 (1-1/2")	540 (3")	1440 (3")	1880 (4-1/2")
LP LSL	1-1/4"	655 (1-1/2")	1240 (3")	3540 (4-1/2")	4485 (6")
	1-1/2"	785 (1-1/2")	1490 (3")	4180 (4-1/2")	4645 (6")

NOTES:

- This table is for preliminary design for uniform gravity loads only. Final design should include a complete analysis of all loads and connections.
- The allowable loads are for a maximum 4' clear span with minimum bearings for each end (listed in parentheses) based on the bearing capacity of the rim board. For headers bearing on wood plates, the bearing length may need to be increased based on the ratio of the bearing capacity of the rim board divided by the bearing capacity of the plate species.
- Normal load duration is assumed and shall be adjusted according to code.
- Depths greater than 11-7/8" shall be used with a minimum of two plies, as shown. Depths of 11-7/8" and less may be used as a two-ply header by multiplying the allowable loads by two.
- Multiple-ply headers shall be toe-nailed to the plate from both faces. Fasten the floor sheathing to the top of each ply to provide proper lateral support for each ply.
- For multiple-ply headers supporting top-loads only, fasten plies together with minimum 8d box nails (2-1/2" x 0.113") at a maximum spacing of 12" oc. Use 2 rows of nails for 9-1/2" and 11-7/8." Use 3 rows for depths 14" and greater. Clinch the nails where possible. For side-loaded multiple-ply headers, refer to the Connection Capacity For Side-Loaded 2-Ply Rim Board Headers table below for the required nailing and the allowable side load that can be applied.
- The designer shall verify proper bearing for the header.
- Joints in the rim are not allowed over openings and must be located at least 12" from any opening.
- Refer to the "APA Performance Rated Rim Boards" (Form No. W345) for additional information including allowable loads for smaller openings.
- Use LP SolidStart LSL for headers with clear spans longer than 4' or for loads greater than tabulated above. See the Design Values table below.

DESIGN VALUES (ALLOWABLE STRESS DESIGN - PSI)^{1,2,3}

Material	Grade	Thickness	Bending F _b ^{4,5}	Modulus of Elasticity E ^{6,7} (x10 ⁹)	Shear F _v	Compression Perpendicular-to-Grain F _{c⊥}
LP OSB	APA-Rated Rim Board	1" & 1-1/8"	600	0.55	270	550
LP LSL	1.35E	≥ 1-1/4"	1730	1.35	410	750

NOTES:

- LP SolidStart LSL and OSB Rim Board shall be designed for dry-use conditions only. Dry-use applies to products installed in dry, covered and well ventilated interior conditions in which the equivalent moisture content in lumber will not exceed 16%. Adjustments for high temperature are beyond the scope of this guide.
- The allowable strengths and stiffness are for normal (10 year) load duration. Bending and Shear stresses shall be adjusted according to code. Modulus of Elasticity and Compression perpendicular-to-grain shall not be adjusted for load duration.
- The allowable strengths and stiffness are for members supporting loads applied parallel to the wide face ("edge" or "beam" orientation).
- The allowable Bending, F_b for LP SolidStart OSB Rim Board has been adjusted to account for volume for clear spans up to 4'. Do not use for clear spans over 4'.
- The allowable Bending, F_b for LP SolidStart LSL is tabulated for a standard 12" depth. For depths other than 12," multiply F_b by (12/depth)^{0.20}. For depths less than 3-1/2," multiply F_b by 1.159.
- Deflection calculations for LP SolidStart LSL shall include both bending and shear deformations.

$$\text{Deflection for a simple span, uniform load: } \Delta = \frac{270wL^4}{Ebd^3} + \frac{28.8wL^2}{Ebd} \quad \text{Where: } \begin{array}{l} \Delta = \text{deflection (in)} \\ w = \text{uniform load (plf)} \\ L = \text{design span (ft)} \end{array} \quad \begin{array}{l} E = \text{modulus of elasticity (from table)} \\ b = \text{width (in)} \\ d = \text{depth (in)} \end{array}$$

Equations for other conditions can be found in engineering references.

- Deflection calculations for LP SolidStart OSB Rim Board need only consider bending deformations (the second half of the above equation may be neglected). The tabulated modulus of elasticity, MOE, is the "apparent" MOE and includes an approximation of the effects of shear deformations.
- LP Solid Start LSL Rim Board used as headers shall be a minimum of two plies for depths greater than 11-7/8" for 1-1/4" and 1-1/2" rim board. All depths may be used as a multiple-ply header if required. Design the header as a single ply based on the tabulated allowable design stresses above and multiply by the number of plies. All plies must be toe-nailed to the plate. Fasten the floor sheathing to the top of each ply.
- For multiple-ply headers supporting top-loads only, fasten plies together with minimum 8d box nails (2-1/2" x 0.113") for 1-1/4" rim board and 10d nails (3" x 0.120") for 1-1/2" rim board, at a maximum spacing of 12" oc. Use 2 rows of nails for 9-1/2" and 11-7/8." Use 3 rows for depths 14" and greater. Clinch the nails where possible. For side-loaded multiple-ply headers, refer to the Connection Capacity For Side-Loaded 2-Ply Rim Board Headers table below for the required nailing and the allowable side load that can be applied.

CONNECTION CAPACITY FOR SIDE-LOADED 2-PLY RIM BOARD HEADERS (PLF)

Material	Thickness	Minimum Nail Size	3 Rows of Nails at 6" oc	4 Rows of Nails at 6" oc	5 Rows of Nails at 6" oc	6 Rows of Nails at 6" oc
LP OSB	1" & 1-1/8"	8d (2-1/2" x 0.113")	768	1024	1280	1536
	1-1/4"	8d (2-1/2" x 0.113")	864	1152	1440	1728
LP LSL	1-1/2"	10d (3" x 0.120")	972	1296	1620	1944

NOTES:

- This table represents the uniform side-load capacity of the connection for a 2-ply header. The total applied uniform load, including top-load and side-load, shall not exceed the allowable uniform load capacity of the header as tabulated above.
- The tabulated side-load capacity is for normal load duration and shall be adjusted according to code.
- Use 3 rows of nails for 9-1/2" and 11-7/8"; 4 rows for 14" and 16"; 5 rows for 18" and 20"; 6 rows for 24" deep rim board. Clinch the nails where possible.
- Headers consisting of more than 2 plies, alternate fastening or higher side loads are possible but require proper design of the connection.

FASTENER VALUES FOR LP® SOLIDSTART® RIM BOARD

The tabulated Lateral Load Capacity values for LP Rim Board (page 3) are based on the connections specified in the Installation details below. These connections allow for the 16d nails, from the sole plate above, into the top edge of the rim provided the deck nailing is at least 6" oc and the 16d nails are spaced in accordance with the prescriptive requirements of the code. Decreasing the nail spacing will not necessarily increase the lateral load capacity and may cause splitting. To increase the lateral resistance, other connection details may be designed, such as adding framing anchors nailed to the face of the rim and the edge of the wall plate. The Fastener Design table below provides information on the equivalent specific gravity for nail, screw, lag and bolt design in accordance with the National Design Specification for Wood Construction (NDS). The prescriptive capacities for 1/2" x 4" (min) lag screws are also provided for ledger attachment. The Nail Spacing Requirements table at right provides guidance on the minimum nail spacing and edge distances. End, edge and spacing distances for screws, lags and bolts shall be as specified in the NDS.

Refer to APA Product Report® PR-L280 or ICC-ES evaluation report ESR-2403 for complete connection information for LP SolidStart LSL.

NOTE: Safety Data Sheets (SDS) are available online at LPCorp.com or by contacting customer support at 1.888.820.0325.

NAIL SPACING REQUIREMENTS						
Material	Thickness	Fastener Orientation	Nail Size	Minimum End Distance	Minimum Nail Spacing per Row	
					Single Row	Multiple Rows
LP OSB	1" & 1-1/8"	Edge	Refer to Installation below			
		Face	See note 4 below			
LP LSL	≥ 1-1/4"	Edge ⁷	8d	2"	4"	na
			10d or 12d	2"	4"	na
			16d ⁵	2-1/2" ⁸	5" ⁸	na
		Face ⁸	8d	7/8"	1"	1"
			10d or 12d	7/8"	1"	1"
			16d ⁵	7/8"	1-1/2"	1-1/2"

NOTES:

- Edge distance shall be sufficient to prevent splitting.
- Multiple rows of nails are not allowed in the edge for LP LSL less than 1-1/2" thick. Multiple rows of nails shall be offset at least 1/2" and staggered, and equally spaced about the centerline of the edge or face (whichever applies).
- Edge orientation refers to nails driven into the narrow edge: parallel to the face of the strands for LP LSL or OSB Rim Board. Face orientation refers to nails driven into the wide face: perpendicular to the face of the strands for LP LSL or OSB Rim Board.
- Face nailing spacing and end distance for LP OSB Rim Board shall be sufficient to prevent splitting. Refer to the "APA Performance Rated Rim Boards" (Form No. W345) for additional information.
- 16d sinkers (3-1/4" x 0.148") may be spaced the same as a 10d and 12d common nail.
- Minimum end distance may be reduced to 2 inches and minimum nail spacing may be reduced to 4" when LP LSL is 1-1/4" thick and the nail penetration into the LSL does not exceed 1-3/8".
- Nail penetration for edge nailing shall not exceed 2" for 16d nails and 2-1/2" for 10d and 12d nails.
- Minimum nail spacing for the face orientation is applicable to nails that are installed in rows that are parallel to the direction of the face grain (length) of the rim board. For nails driven into the face in rows that are perpendicular to the direction of the grain (thickness/depth) of the rim board, the minimum nail spacing must be sufficient to prevent splitting of the wood.
- For LP LSL with a thickness of 1-1/2" and greater, refer to APA Product Report® PR-L280 and ICC-ES evaluation report ESR-2403 for additional information.

FASTENER DESIGN

Material	Thickness	Equivalent Specific Gravity						Lateral Capacity for 1/2" x 4" Lag Screw (lbs)
		Nails only		Nails and Wood Screws		Bolts and Lag Screws		
		Withdrawal	Face	Dowel Bearing	Face	Dowel Bearing (into the face only)	Face	
LP OSB	1"	na	0.50	na	0.50	na	na	300
	1-1/8"	na	0.50	na	0.50	na	na	350
LP LSL	≥ 1-1/4"	0.46	0.50	0.50	0.55	0.50	0.58	675

NOTES:

- Fastener design for each connection type listed to the left is for normal (10 year) load duration and shall be adjusted according to code.
- Fastener spacing, end and edge distance shall be according to code except as specified in the Nail Spacing Requirements above.
- The Equivalent Specific Gravity values shall be used to determine fastener capacities in accordance with the NDS.
- The 1/2" Lag Screw capacity assumes a nominal 2x (1-1/2" thick) side member with full penetration into the main member. 1/2" through-bolts may be used in lieu of the lag screws. Proper washers shall be installed.
- Refer to the "APA Performance Rated Rim Boards" (Form No. W345) for additional information.

INSTALLATION

RIM TO JOIST CONNECTION

Nail rim to I-Joist with one 8d (box or common) or 10d box nail into each flange.

DECK TO RIM AND RIM TO PLATE CONNECTIONS¹

- Nail floor sheathing to rim board with 8d nails at 6" oc.
- Nail wall plate through floor sheathing into rim per code.
- Toe-nail rim board to wall plate with 8d nails at 6" oc.

See T&G Trim Requirements detail and table.

T&G TRIM REQUIREMENTS²

See T&G Trim Requirements table below for when to trim tongue or groove.

NOTES:

- Additional framing connectors to the face of the rim board may be used to increase lateral capacity for wind and seismic design.
- Trim the tongue or groove of the floor sheathing in accordance with the T&G Trim Requirements table.

T&G TRIM REQUIREMENTS

Floor Sheathing Thickness	Rim Board Thickness				
	1"	1-1/8"	1-1/4"	> 1-1/4"	
≤ 7/8"	Trim	Not Required	Not Required	Not Required	
> 7/8"	Trim	Trim	Trim	Not Required	

LP® SolidStart® Engineered Wood Products are manufactured at different locations in the United States and Canada. Please verify availability with the LP SolidStart Engineered Wood Products distributor in your area before specifying these products.



For product catalog & complete warranty details, visit LPCorp.com

For more information on the full line of LP SolidStart Engineered Wood Products or the nearest distributor, please contact 1.888.820.0325 or e-mail customer.support@lpcorp.com. Visit our web site at www.lpcorp.com.

Cal. Prop 65 Warning:

WARNING: Drilling, sawing, sanding or machining wood products can expose you to wood dust, a substance known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more information go to www.P65Warnings.ca.gov/wood.

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