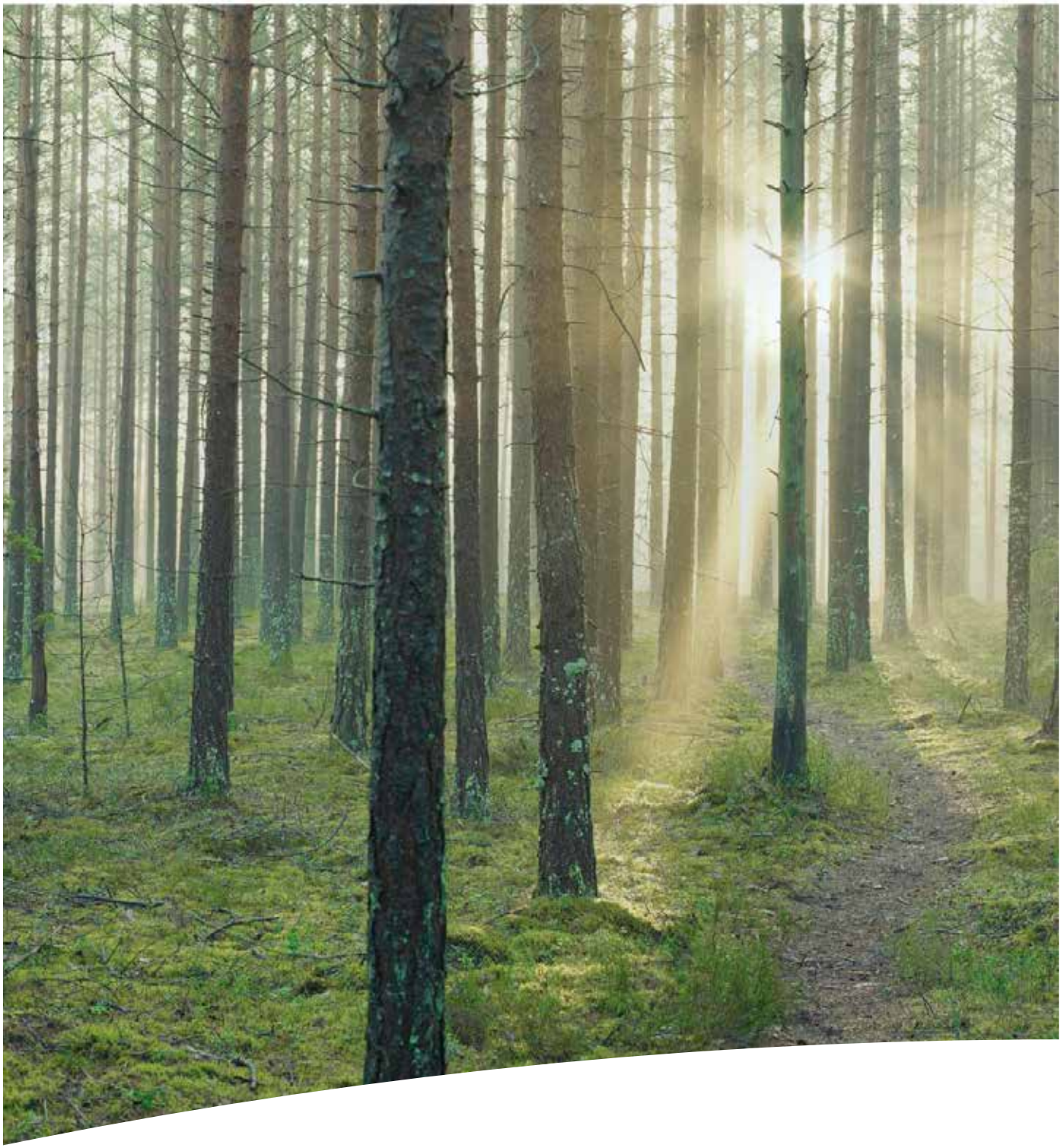


LVL by Stora Enso
Technical brochure

storaenso

Stora Enso
The renewable materials company

Stora Enso is a leading provider of renewable solutions in packaging, biomaterials, wooden constructions and paper on global markets.

Our aim is to replace fossil based materials by innovating and developing new products and services based on wood and other renewable materials.

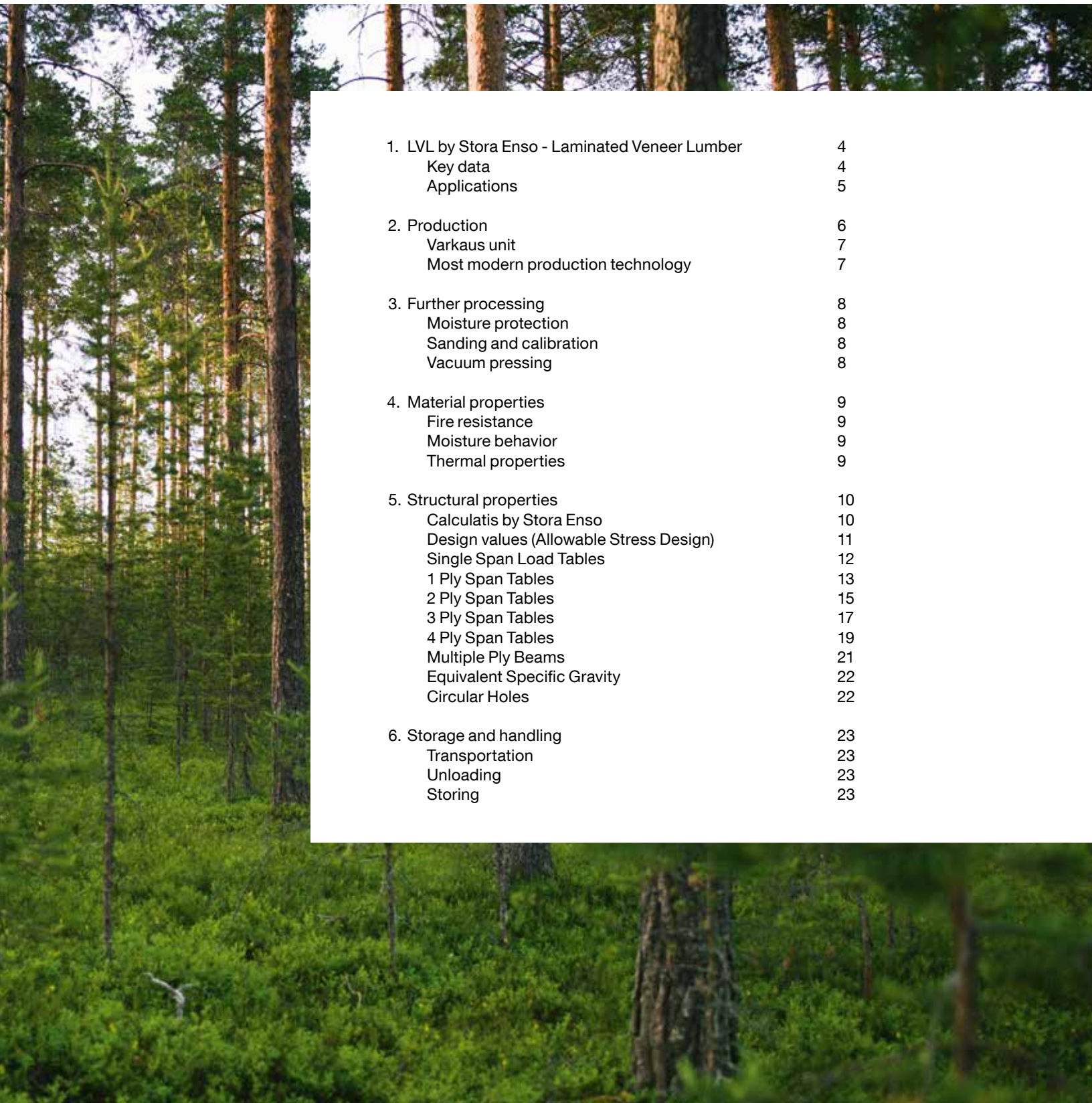
The Group has some 25,000 employees in more than 35 countries. Our sales in 2016 were EUR 9.8 billion, with an operational EBIT of EUR 884 million.

Population growth, urbanisation, climate change and eco-awareness are strong trends driving the business for wood-based solutions. Cities are growing and consequently there is greater need for residential housing as well as office and commercial buildings, resulting in an increased demand for lighter, easy-to-assemble and renewable construction materials.

We believe in a sustainable and energy-efficient construction method for the public and private sectors. Wood, our most important raw material, has many advantages over the materials made from non-renewable resources. Wood is renewable, recyclable and it can be used as a bioenergy at the end of its life cycle. With carbon captured in the wood, the products offer a truly sustainable means of combating climate change.

Stora Enso products are manufactured from responsibly sourced wood. The wood supply chains to Stora Enso's Wood Products units are covered by a wood traceability system, which is third-party certified according to PEFC™ or FSC® Chain of Custody system, or according to both systems.

Contents



1. LVL by Stora Enso Laminated Veneer Lumber

Code Evaluations: See DrJ Technical Evaluation Report TER No. 1507-01.

Key data

Basic information	Laminated Veneer Lumber (LVL) is an advanced wood product suitable for a wide range of structural applications, from new build to repair. Being one of the strongest wood-based construction materials relative to its weight, LVL provides an ideal solution when strength, dimensional stability and high load-bearing capacity are essential – not forgetting the homogeneous quality and good workability.
Use	Structural applications; beams, floor joists, headers, post-and-beam frames, roof joists and stud.
Maximum width	96"
Standard thickness	1" - 7"
Maximum length	78'
Wood species	Spruce (Picea abies)
Adhesives	LVL is consisting of multiple layers of veneers that are bonded together with brown phenolic resin. Top face veneer scarf joints are bonded with clear melamine-formaldehyde resin. LVL meets the heat durability performance requirements per ASTM D7247.
Moisture content	8 - 10% at delivery
Surface quality	Intended for non-visual end usages. Standard LVL is delivered unsanded with a clear glue line on the top face.
Weight	Mean density 31.8 lb/ft^3
Thermal conductivity λ	0.9 BTU in/hr-ft^2-°F

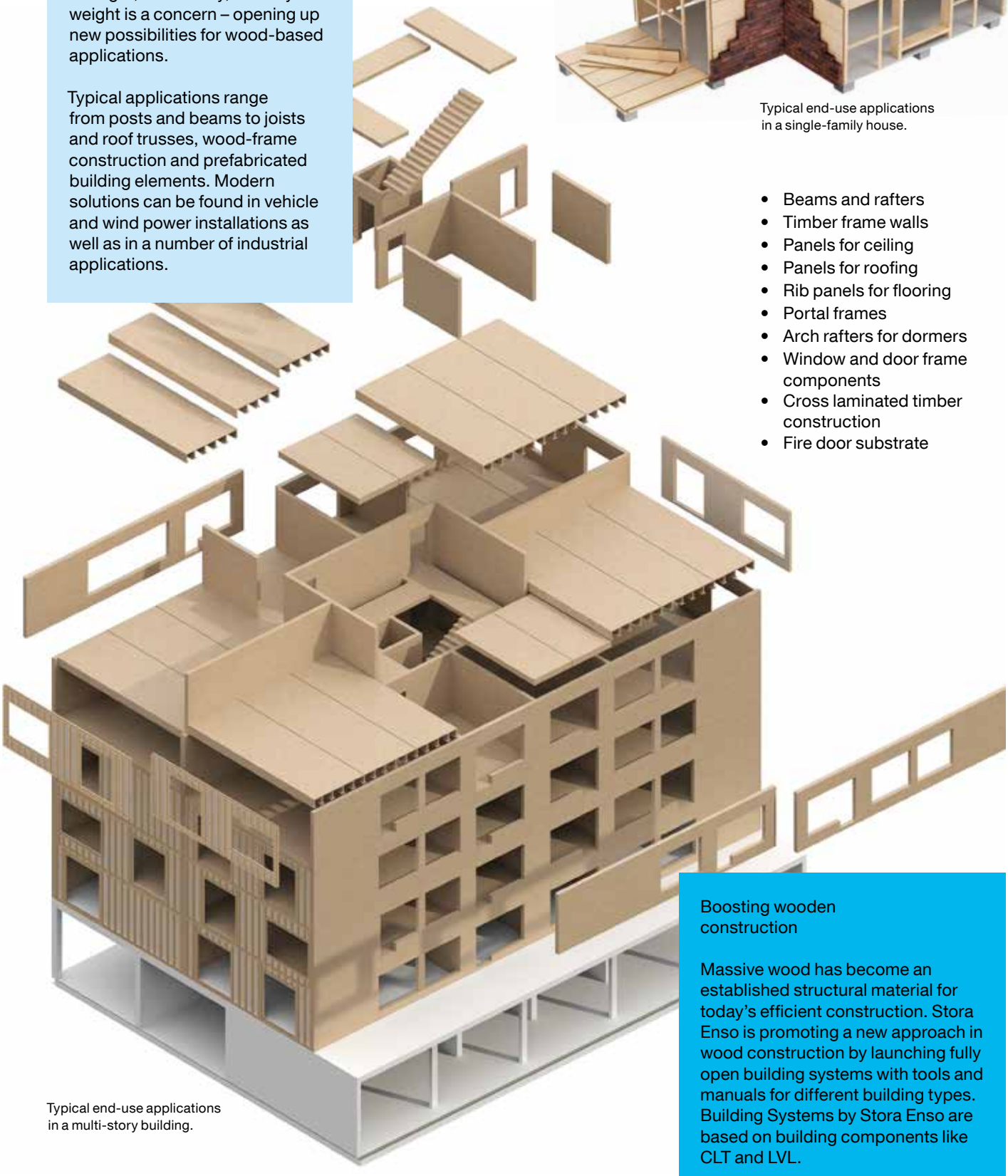
Applications

LVL can be used in various challenging construction and industrial end usages where strength, workability, stability and weight is a concern – opening up new possibilities for wood-based applications.

Typical applications range from posts and beams to joists and roof trusses, wood-frame construction and prefabricated building elements. Modern solutions can be found in vehicle and wind power installations as well as in a number of industrial applications.

Typical end-use applications in a single-family house.

- Beams and rafters
- Timber frame walls
- Panels for ceiling
- Panels for roofing
- Rib panels for flooring
- Portal frames
- Arch rafters for dormers
- Window and door frame components
- Cross laminated timber construction
- Fire door substrate



Typical end-use applications in a multi-story building.

Boosting wooden construction

Massive wood has become an established structural material for today's efficient construction. Stora Enso is promoting a new approach in wood construction by launching fully open building systems with tools and manuals for different building types. Building Systems by Stora Enso are based on building components like CLT and LVL.

2. Production

Stora Enso's Wood Products division provides versatile wood-based solutions for building and housing. Our product range covers all areas of urban construction including massive wood elements and building systems, wood components and pellets. We also offer a variety of sawn timber goods.

Wood Products operates globally and has 20 production units in Europe. Our global distribution network ensures consistent and efficient deliveries to our customers.

In the manufacturing process, we set constantly higher targets to minimize negative environmental and social impacts and to maximize the efficiency of all raw material use. To achieve operational excellence, we apply integrated management systems. Stora Enso's Wood Products units have a good coverage of third-party certified management systems for Quality (ISO 9001) Environment (ISO 14001) and Occupational Health and Safety (OHSAS 18001).

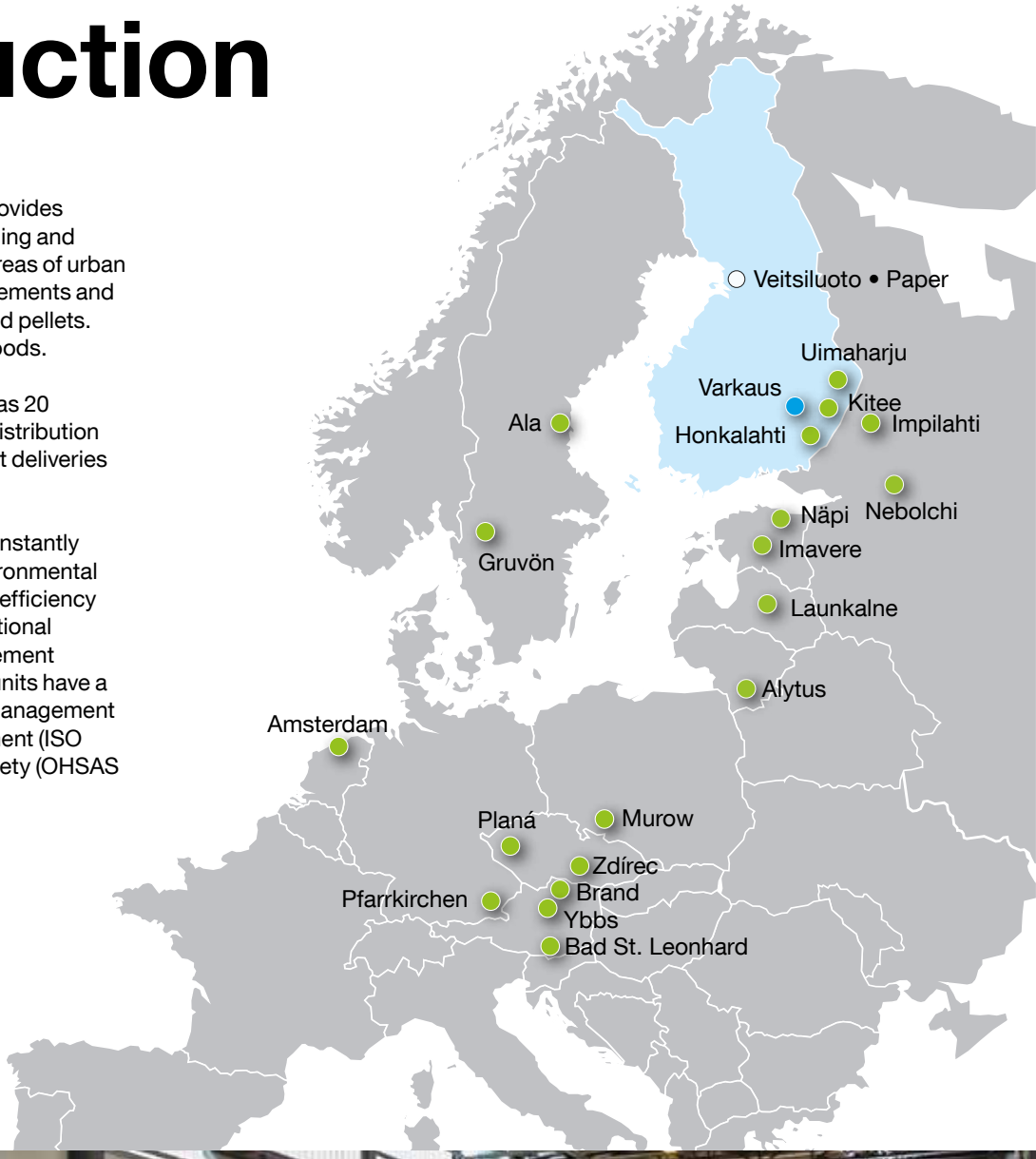
Sawing Capacity
- Total 192 billion ft³

Further Processing Capacity
- Total 86 billion ft³

Pellet Capacity
- Total 430,000 tons

CLT Capacity
- Total 5.3 billion ft³

LVL Capacity
- Total 2.3 billion ft³



Varkaus unit

Varkaus mill, situated in the Eastern Finland surrounded by rich forest areas, consists of a containerboard mill, pulp mill, sawmill and an LVL mill. Thanks to own wood purchasing operations Stora Enso has a full control over the whole value chain from raw material to the tailor-made products.

Varkaus has an annual sawing capacity of 4,600,000 ft^3 and LVL capacity of 3,500,00 ft^3.

The integrate is self-sufficient in energy. Combined heat and power plants use 95% bio- and recycled fuels maximizing the energy efficiency and minimizing fossil CO_2 emissions.

Most modern production technology

The essential benefits of LVL are derived from the choice of raw material used and the manner of production: logs are rotary peeled into 1/8" thick veneers and bonded together under heat and pressure.

Every sheet of veneer is individually measured in terms of density, moisture content and modulus of elasticity to optimize the product performance. Sheets are then re-glued into a continuous billet to create S grade products on the most advanced production line built to date in Europe.

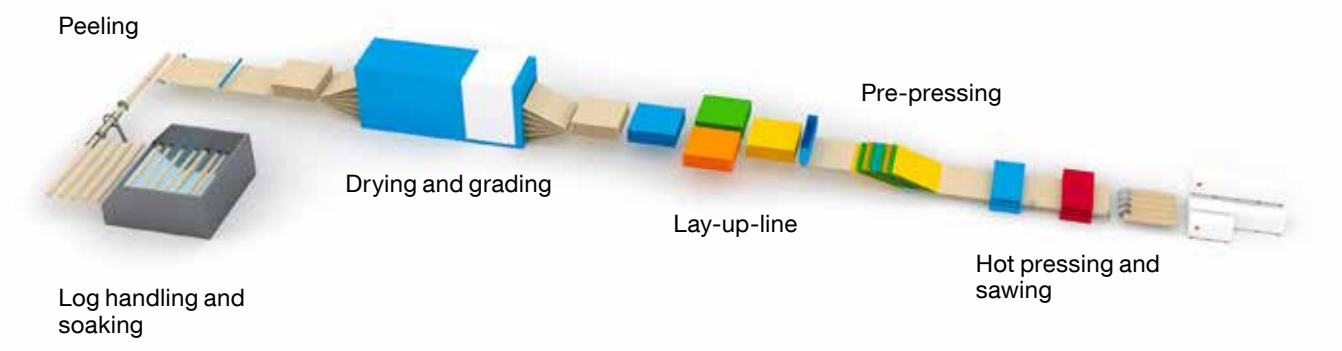


Illustration of the LVL line

3. Further processing

Moisture protection

LVL products can be treated with a water-borne wood oil (Teknoshield 4015).

Moisture protection is accurately applied to all four sides and ends in order to achieve greater protection.

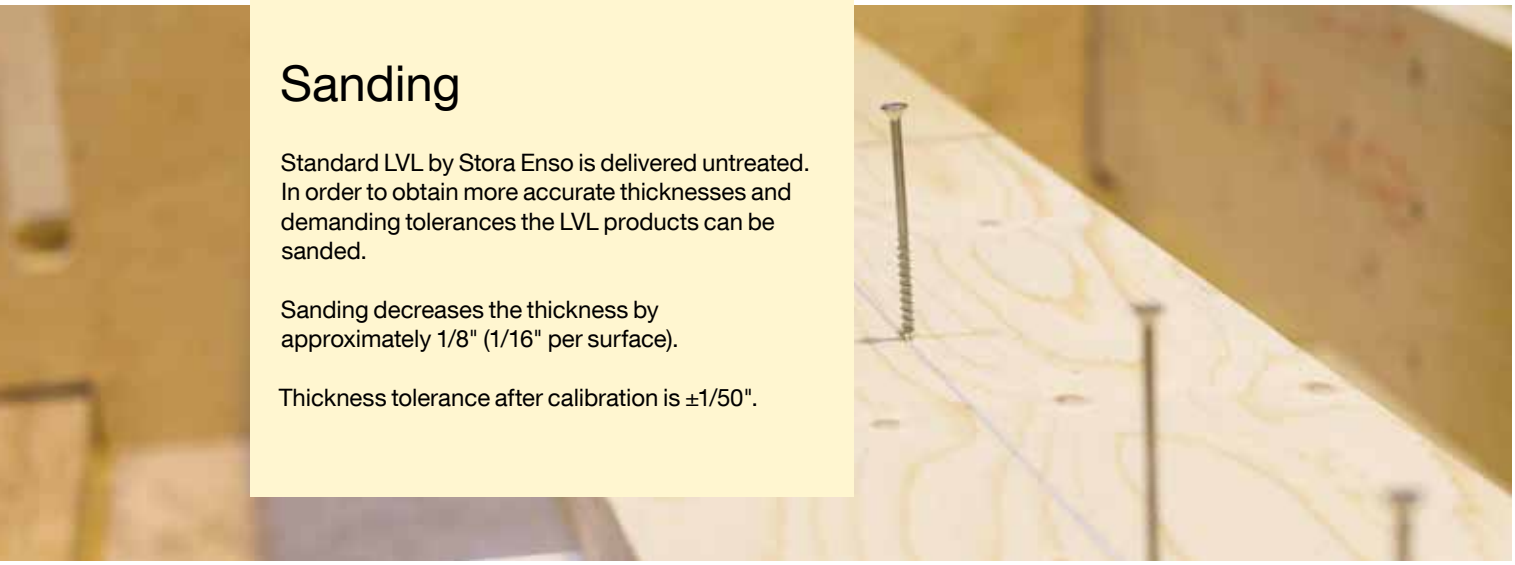
Moisture protection is intended only for temporary protection during the storage and construction time at site. Surfaces exposed to continuous weather strain are recommended to be retreated once a year.

Sanding

Standard LVL by Stora Enso is delivered untreated. In order to obtain more accurate thicknesses and demanding tolerances the LVL products can be sanded.

Sanding decreases the thickness by approximately 1/8" (1/16" per surface).

Thickness tolerance after calibration is ±1/50".



Vacuum pressing

In order to deliver a more comprehensive, inclusive and flexible product range we have installed a vacuum pressing line in our post production facility.

Not only can we produce beams for a variety of load bearing end-uses but by vacuum pressing we can create massive elements up to 11'-9" in width, 10'-6" in height and 62' in length.

Different types of lay-up models and wall elements of various thicknesses can be used to build even the most demanding structures for every building bespoke (e.g. wooden multi-story buildings).

4. Material properties

Fire resistance

The temperature at which LVL ignites when it is exposed to a flame is about 518°F. A temperature of over 752°F is needed to cause spontaneous combustion.

- Nominal charring rate of LVL is $\beta n = 0.027$ in/min
- Example: $t = 60$ min, $n = \beta n \cdot t = 0.027 \times 60 = 1.62$ in

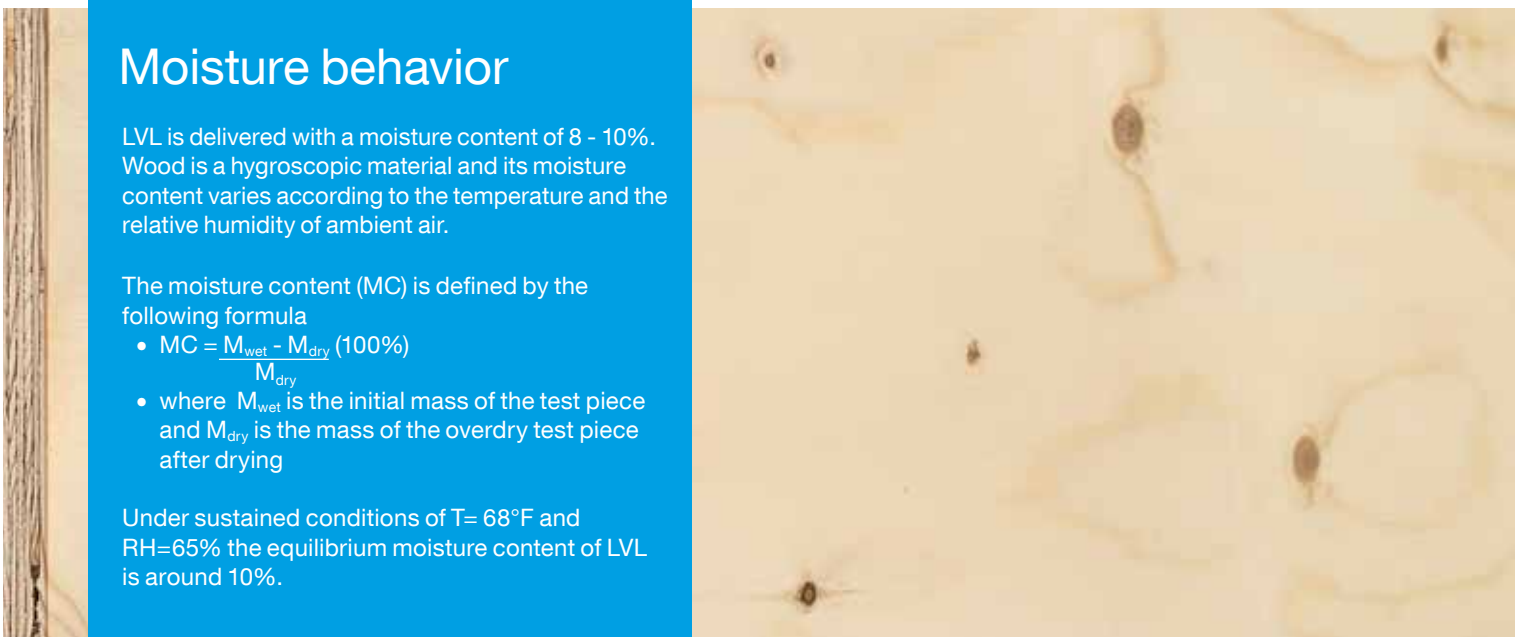
Moisture behavior

LVL is delivered with a moisture content of 8 - 10%. Wood is a hygroscopic material and its moisture content varies according to the temperature and the relative humidity of ambient air.

The moisture content (MC) is defined by the following formula

- $MC = \frac{M_{wet} - M_{dry}}{M_{dry}} (100\%)$
- where M_{wet} is the initial mass of the test piece and M_{dry} is the mass of the overdry test piece after drying

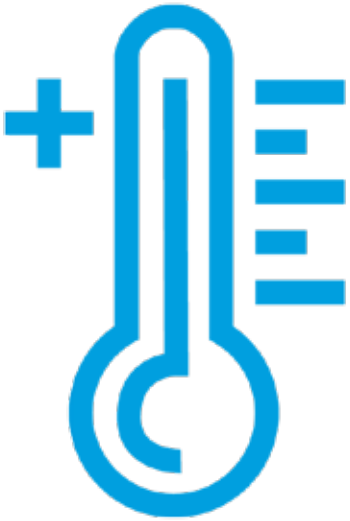
Under sustained conditions of T= 68°F and RH=65% the equilibrium moisture content of LVL is around 10%.



Thermal properties

The thermal conductivity of LVL depends on its moisture content. With a RH of 47% the moisture content of LVL is 9.3% and the thermal conductivity coefficient, $\lambda = 0.76$ BTU in/hr-ft2-°F. Within a RH of 93% the moisture content of LVL is 25% and the thermal conductivity coefficient, $\lambda = 0.90$ BTU in/hr-ft2-°F.

LVL dimensions are very stable under heat and the thermal deformation can generally be disregarded.



5. Structural properties

The design guidelines and tables in this brochure are provided to assist in the selection of LVL by Stora Enso for use in common structural applications.

The design properties provided in the table on page 11 have been established using the procedures provided in ASTM D5456.

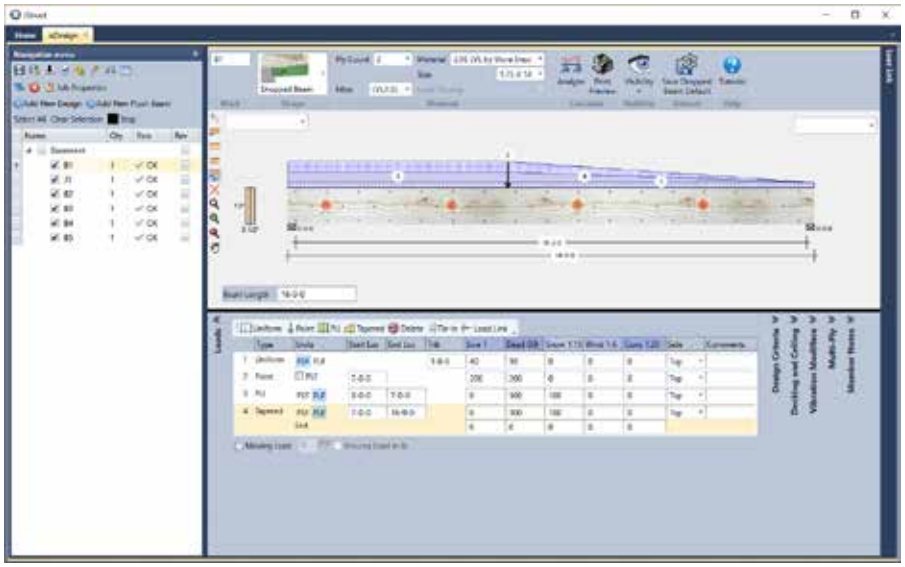
SYSTEM REQUIREMENTS
- Windows 8 or 10
- Intel multi core i series processor, i5 or better or AMD equivalent.
- 4GB ram or better
- Hard disk free space of 1 GB or more
- High speed internet access for registration and updates
- Monitor with a resolution of 1680 x 1050 or higher

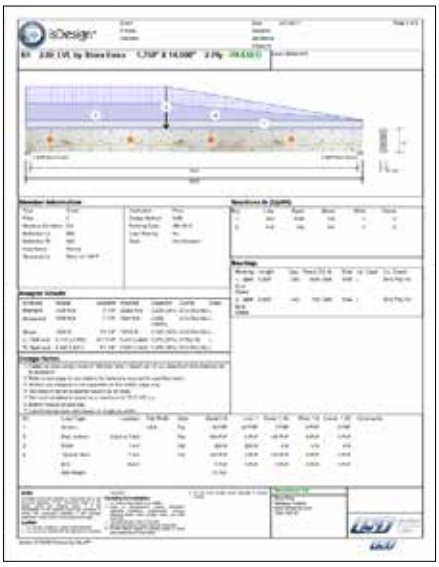
Design software

iStruct™ by Stora Enso
iStruct™ ewp design software is a windows based structural analysis software suite that allows users to model and design a single joist or beam or an entire system.

isDesign™ (part of iStruct™) is a single member sizing module that allows users to size Stora Enso products by inputting specifics about spans, supports and loading conditions. isDesign supports all U.S. and Canadian building codes. Designs can be created with either imperial or metric units.

The software provides a unique interactive experience for inputting and designing members. Designs can even include hanger and multi-ply fastener design.





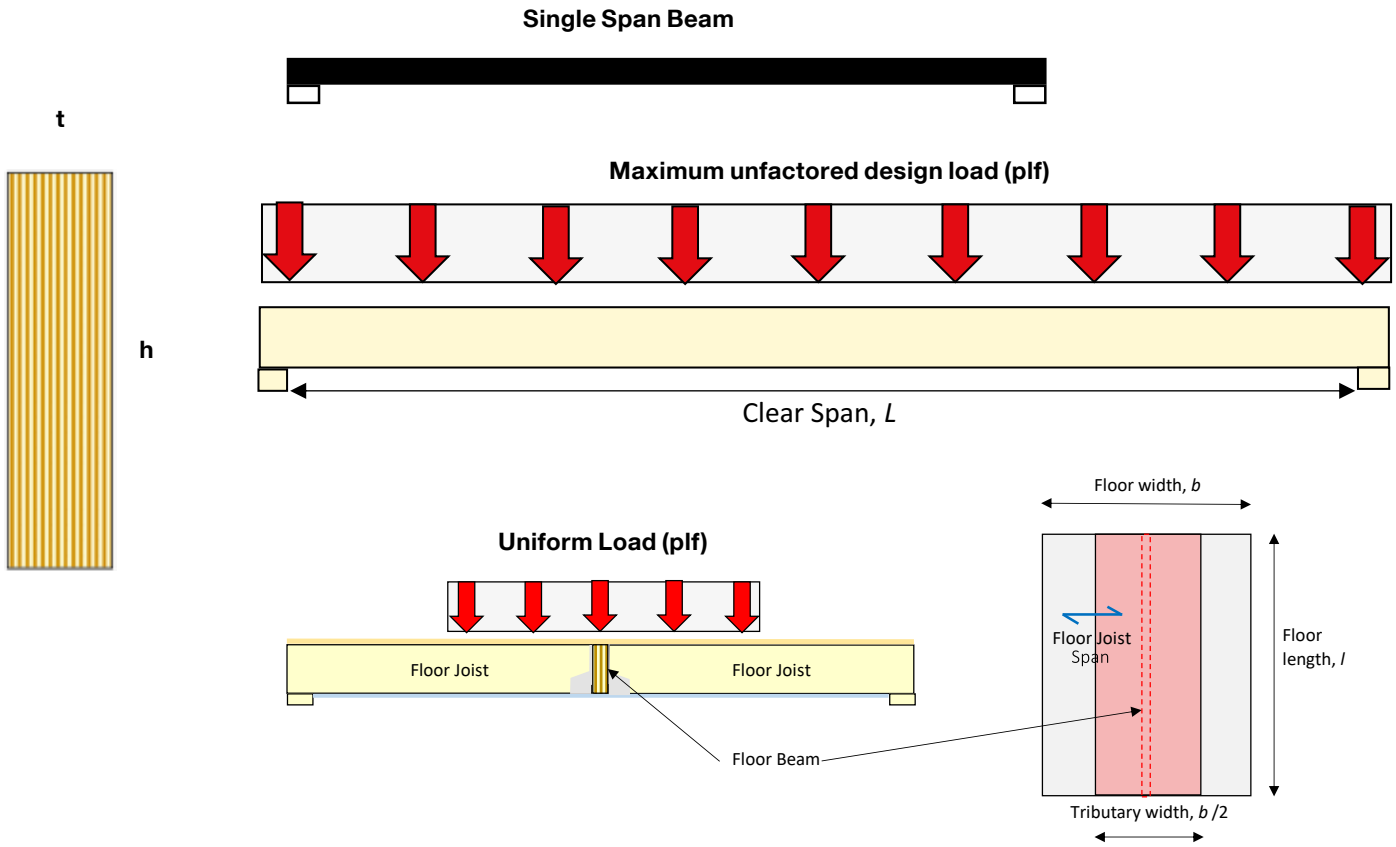
iStruct™, isDesign™ are licensed trademarks of Calculated Structured Designs, Calgary, Alberta Canada

Design values (Allowable Stress Design)

Bending, F_b (psi)		Tension, F_t (psi)	Compression, F_c (psi)			Horizontal Shear, F_v (psi)		Beam Modulus of Elasticity, E (psi)		Plank Modulus of Elasticity, E (psi)		Modulus of Elasticity for Beam & Column Stability, E_{min} (psi)
Beam[6,7,8]	Plank	Parallel-to-Grain[8,9]	Parallel to-Grain	Perpendicular to-Grain		Beam	Plank	True[5]	Apparent[5]	True[5,10]	Apparent[5,10]	
				Beam	Plank							
3,000	3,300	2,300	2,750	900	550	350	100	2.0×10^6	1.9×10^6	2.0×10^6	1.9×10^6	1.1×10^6

1. 1 psi = 0.00689 MPa or 1 MPa = 145 psi.
2. The reference design values in this table are applicable for the product used in dry, well-ventilated interior applications, in which the equivalent moisture content of sawn lumber is less than 16%.
3. The reference design values in this table are for normal load duration. Loads of longer or shorter duration shall be adjusted in accordance with the applicable code. Duration of load adjustments shall not be applied to $F_{c\perp}$ and E.
4. Orientation nomenclature for S-LVL™.
5. The Apparent E for both beams and planks can be used directly in traditional beam deflection formulas. The True E values (i.e., shear-free) are for both beams and planks. Using True E, deflection is calculated as follows for uniformly loaded simple span beams.
   $\Delta = [5WL^4/(32Eth^3)] + [12WL^2/(5Eth)]$
   where: Δ = deflection in inches
   W = uniform load in lbs./in.
   L = span in inches
   E = modulus of elasticity in psi
   t = width of beam in inches
   h = depth of beam in inches
6. The design value for bending members used in a beam orientation is based on a referenced depth of 12". For other depths, the bending values shall be adjusted by a size factor adjustment of $(12/d)^{0.117}$, where d is measured in inches with a minimum depth of $3^{15}/_{16}$".
7. When structural members qualify as repetitive members in accordance with the applicable code, a 4% increase is permitted.
8. Thicknesses greater than 5¼" shall not be used in design.
9. Design value multiplied by $(4.43/L)^{0.129}$ for length effect factors, with L measured in feet. Value limited to members 18" deep and less.
10. Based on 1.75" thickness.

Single Span Load Tables



Notes:

1. All uniform loads given in the tables are in pounds per lineal foot (plf).
2. The top line (LL) of each table indicates the allowable load-carrying capacity using the live load deflection limit.
3. The middle line (TL) of each table indicates the allowable load carrying capacity (in addition to the self-weight of the beam) using the total load deflection limit of the member.
4. The bottom line (Brg) of each table indicates the required bearing length at each end of the beam in inches when loaded to the maximum loads allowed and assumes that the compression strength of the bearing material is greater than or equal to the compression perpendicular to grain design value of the S-LVL™ beam. Shorter bearing lengths may be possible with lighter loads, and longer bearing lengths may be required where the compression strength of the bearing material is less than the compression perpendicular to grain design value of the S-LVL™ beam. Calculations are based on a design span measured from centerline of required bearing to centerline of required bearing. If different bearing lengths are required, design span should be evaluated accordingly.
5. For live load deflection factors of LL/180 and LL/480, multiply the maximum live load value (LL/240) by 1.333 and (LL/360) by 0.667. The result shall not exceed the maximum allowable total load (TL).
6. These tables are for gravity loads only. Consult a registered design professional for wind and seismic load analysis and design.
7. All tables are based on uniform load conditions. Any concentrated load applications must be analyzed separately or converted to an equivalent uniform load.
8. The compression edge of the header or beam must be laterally supported at intervals of 24" or less. In addition, lateral support must be provided at bearing points.
9. 1.5"x14", 1.5"x16", 1.5"x18", 1.5"x20", 1.5"x24", 1.75"x16", 1.75"x18", 1.75"x20" and 1.75"x24" are to be used as minimum two ply members only unless both the top and bottom edge of the member are held in line for the entire length of the beam and the ends at points of bearing are held in position to prevent rotation and/or lateral displacement.

1.5" 1 Ply Stora Enso S-LVL Beam Tables (ASD)
Total Load (PLF) / Live Load (PLF) / Minimum Bearing (IN)

Clear Span		1 Ply LL/360 TL/240 C_D=1.0							1 Ply LL/240 TL/180 C_D=1.15							1 Ply LL/240 TL/180 C_D=1.25						
		7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24
6	LL	577	1189	1744	2273	2815	3364	4621	840	1353	1968	2566	3158	3753	4621	849	1461	2112	2754	3369	4007	4621
	TL	735	1189	1744	2273	2815	3364	4621	840	1353	1968	2566	3158	3753	4621	908	1461	2112	2754	3369	4007	4621
	Brg	1.75	2.75	4.25	6	7.5	9.25	12	2	3.25	5	6.75	8.5	10.5	12	2.25	3.5	5.5	7.25	9.25	11.25	12
8	LL	249	549	1028	1368	1716	2091	3271	374	788	1171	1558	1946	2360	3592	374	811	1267	1677	2095	2529	3592
	TL	372	689	1028	1368	1716	2091	3271	483	788	1171	1558	1946	2360	3592	496	853	1267	1677	2095	2529	3592
	Brg	1.5	2.25	3.25	4.5	5.75	7	12	1.5	2.5	3.75	5	6.5	8	12	1.5	2.75	4	5.5	7	8.75	12
10	LL	129	288	553	885	1145	1401	2264	193	430	769	1032	1301	1593	2545	193	427	815	1113	1404	1718	2736
	TL	191	430	657	904	1145	1401	2264	256	513	769	1032	1301	1593	2545	256	555	833	1113	1404	1718	2736
	Brg	1.5	1.75	2.5	3.5	4.5	5.75	9.75	1.5	2	3	4	5.25	6.5	11.25	1.5	2.25	3.25	4.5	5.75	7	12
12	LL	75	169	325	525	772	1000	1642	112	253	485	728	924	1139	1859	112	253	483	775	1002	1230	2002
	TL	110	251	471	637	811	1000	1642	148	331	541	728	924	1139	1859	148	331	586	789	1002	1230	2002
	Brg	1.5	1.5	2.25	3	3.75	4.75	8.25	1.5	1.5	2.5	3.5	4.5	5.5	9.5	1.5	1.5	2.75	3.75	4.75	6	10.25
14	LL	47	107	208	336	495	696	1241	71	160	309	500	690	852	1412	71	160	309	498	734	923	1523
	TL	69	157	308	470	603	746	1241	93	211	399	540	690	852	1412	93	211	409	586	748	923	1523
	Brg	1.5	1.5	1.75	2.5	3.25	4	7	1.5	1.5	2.25	3	3.75	4.75	8	1.5	1.5	2.25	3.25	4	5	8.75
16	LL	31	71	140	228	337	474	965	47	107	209	340	501	655	1103	47	107	209	338	499	701	1191
	TL	45	105	207	329	452	574	965	61	141	276	412	532	655	1103	61	141	276	447	575	714	1191
	Brg	1.5	1.5	1.5	2	2.75	3.5	6.25	1.5	1.5	1.75	2.5	3.25	4	7	1.5	1.5	1.75	2.75	3.5	4.5	7.75
18	LL	22	50	98	161	238	336	772	33	75	148	240	355	501	883	33	75	148	240	354	499	956
	TL	31	73	144	238	353	457	772	42	98	194	316	422	524	883	42	98	194	316	458	569	956
	Brg	1.5	1.5	1.5	1.75	2.5	3.25	5.5	1.5	1.5	1.5	2.25	3	3.75	6.25	1.5	1.5	1.5	2.25	3.25	4	6.75
20	LL	- -	37	72	118	175	247	571	24	55	108	177	261	369	721	24	55	108	177	261	368	781
	TL	- -	52	104	173	258	361	630	30	71	141	230	343	427	721	30	71	141	230	343	460	781
	Brg	- -	1.5	1.5	1.5	2	2.75	5	1.5	1.5	1.5	1.75	2.75	3.25	5.75	1.5	1.5	1.5	1.75	2.75	3.5	6.25
22	LL	- -	27	54	89	132	187	434	- -	41	81	133	197	279	599	- -	41	81	133	197	278	644
	TL	- -	39	78	129	194	268	523	- -	52	105	174	259	353	599	- -	52	105	174	259	366	651
	Brg	- -	1.5	1.5	1.5	1.75	2.25	4.5	- -	1.5	1.5	1.5	2.25	3	5.25	- -	1.5	1.5	1.5	2.25	3.25	5.5
24	LL	- -	21	41	68	102	145	337	- -	32	62	103	153	216	502	- -	32	62	103	153	216	501
	TL	- -	29	59	99	149	212	436	- -	40	80	133	191	283	506	- -	40	80	133	191	283	545
	Brg	- -	1.5	1.5	1.5	1.5	2	4	- -	1.5	1.5	1.5	1.75	2.75	4.75	- -	1.5	1.5	1.5	1.75	2.75	5
26	LL	- -	- -	33	54	80	114	266	- -	25	49	81	121	171	398	- -	25	49	81	121	171	396
	TL	- -	- -	46	77	116	166	376	- -	31	62	104	150	223	428	- -	31	62	104	150	223	469
	Brg	- -	- -	1.5	1.5	1.5	1.75	3.75	- -	1.5	1.5	1.5	1.5	2.25	4.25	- -	1.5	1.5	1.5	1.5	2.25	4.75
28	LL	- -	- -	26	43	64	92	214	- -	20	39	65	97	137	320	- -	20	39	65	97	137	319
	TL	- -	- -	36	61	92	133	315	- -	24	49	82	124	178	373	- -	24	49	82	124	178	405
	Brg	- -	- -	1.5	1.5	1.5	1.5	3.5	- -	1.5	1.5	1.5	1.5	2	4	- -	1.5	1.5	1.5	1.5	2	4.5
30	LL	- -	- -	21	35	52	75	175	- -	- -	32	52	79	112	261	- -	- -	32	52	79	112	261
	TL	- -	- -	28	48	74	107	256	- -	- -	39	66	100	144	325	- -	- -	39	66	100	144	341
	Brg	- -	- -	1.5	1.5	1.5	1.5	3	- -	- -	1.5	1.5	1.5	1.75	3.75	- -	- -	1.5	1.5	1.5	1.75	4

1.75" 1 Ply Stora Enso S-LVL Beam Tables (ASD)

Total Load (PLF) / Live Load (PLF) / Minimum Bearing (IN)

Clear Span		1 Ply LL/360 TL/240 C_D=1.0							1 Ply LL/240 TL/180 C_D=1.15							1 Ply LL/240 TL/180 C_D=1.25						
		7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24
6	LL	673	1387	2035	2652	3284	3925	5391	981	1579	2296	2993	3684	4379	5391	990	1705	2464	3213	3931	4675	5391
	TL	858	1387	2035	2652	3284	3925	5391	981	1579	2296	2993	3684	4379	5391	1059	1705	2464	3213	3931	4675	5391
	Brg	1.75	2.75	4.25	6	7.5	9.25	12	2	3.25	5	6.75	8.5	10.5	12	2.25	3.5	5.5	7.25	9.25	11.25	12
8	LL	291	641	1199	1596	2002	2440	3816	437	920	1366	1818	2270	2753	4191	437	947	1478	1957	2444	2950	4191
	TL	434	803	1199	1596	2002	2440	3816	564	920	1366	1818	2270	2753	4191	579	995	1478	1957	2444	2950	4191
	Brg	1.5	2.25	3.25	4.5	5.75	7	12	1.5	2.5	3.75	5	6.5	8	12	1.5	2.75	4	5.5	7	8.75	12
10	LL	150	336	646	1033	1335	1635	2641	228	502	897	1204	1518	1859	2970	226	499	951	1299	1638	2005	3192
	TL	223	502	767	1055	1335	1635	2641	302	598	897	1204	1518	1859	2970	298	648	971	1299	1638	2005	3192
	Brg	1.5	1.75	2.5	3.5	4.5	5.75	9.75	1.5	2	3	4	5.25	6.5	11.25	1.5	2.25	3.25	4.5	5.75	7	12
12	LL	87	197	379	612	900	1166	1916	133	296	566	849	1078	1329	2169	131	296	563	905	1169	1435	2335
	TL	129	292	550	743	946	1166	1916	176	386	631	849	1078	1329	2169	173	386	684	921	1169	1435	2335
	Brg	1.5	1.5	2.25	3	3.75	4.75	8.25	1.5	1.5	2.5	3.5	4.5	5.5	9.5	1.5	1.5	2.75	3.75	4.75	6	10.25
14	LL	55	124	242	392	578	812	1448	84	187	361	583	805	994	1648	83	187	361	581	856	1077	1776
	TL	80	184	360	549	703	871	1448	110	246	466	631	805	994	1648	108	246	477	684	873	1077	1776
	Brg	1.5	1.5	1.75	2.5	3.25	4	7	1.5	1.5	2.25	3	3.75	4.75	8	1.5	1.5	2.25	3.25	4	5	8.75
16	LL	37	83	163	266	393	553	1126	56	125	244	396	585	765	1287	55	125	244	395	583	817	1389
	TL	53	122	241	384	528	670	1126	73	164	322	481	621	765	1287	72	164	322	522	671	834	1389
	Brg	1.5	1.5	1.5	2	2.75	3.5	6.25	1.5	1.5	1.75	2.5	3.25	4	7	1.5	1.5	1.75	2.75	3.5	4.5	7.75
18	LL	26	59	115	188	278	392	901	40	88	173	280	414	584	1030	39	88	173	280	413	582	1115
	TL	36	85	169	278	412	533	901	50	114	226	369	493	611	1030	50	114	226	369	535	664	1115
	Brg	1.5	1.5	1.5	1.75	2.5	3.25	5.5	1.5	1.5	1.5	2.25	3	3.75	6.25	1.5	1.5	1.5	2.25	3.25	4	6.75
20	LL	- -	43	84	138	205	289	666	29	64	126	206	304	431	841	28	64	126	206	304	429	911
	TL	- -	61	122	202	302	422	735	36	83	164	268	400	498	841	35	83	164	268	400	537	911
	Brg	- -	1.5	1.5	1.5	2	2.75	5	1.5	1.5	1.5	1.75	2.75	3.25	5.75	1.5	1.5	1.5	1.75	2.75	3.5	6.25
22	LL	- -	32	63	104	154	219	506	21	48	95	156	230	326	699	21	48	95	156	230	325	751
	TL	- -	45	91	151	226	313	610	26	61	122	203	302	412	699	26	61	122	203	302	427	759
	Brg	- -	1.5	1.5	1.5	1.75	2.25	4.5	1.5	1.5	1.5	1.5	2.25	3	5.25	1.5	1.5	1.5	1.5	2.25	3.25	5.5
24	LL	- -	25	48	80	119	169	393	- -	37	73	120	179	252	586	- -	37	73	120	179	252	584
	TL	- -	34	69	115	174	248	509	- -	46	93	155	222	330	590	- -	46	93	155	222	330	636
	Brg	- -	1.5	1.5	1.5	1.5	2	4	- -	1.5	1.5	1.5	1.75	2.75	4.75	- -	1.5	1.5	1.5	1.75	2.75	5
26	LL	- -	- -	38	63	94	133	311	- -	29	57	94	141	199	465	- -	29	57	94	141	199	462
	TL	- -	- -	53	89	135	194	439	- -	36	73	121	175	260	499	- -	36	73	121	175	260	547
	Brg	- -	- -	1.5	1.5	1.5	1.75	3.75	- -	1.5	1.5	1.5	1.5	2.25	4.25	- -	1.5	1.5	1.5	1.5	2.25	4.75
28	LL	- -	- -	30	50	75	107	250	- -	23	46	75	113	160	374	- -	23	46	75	113	160	372
	TL	- -	- -	42	71	107	155	367	- -	28	57	96	145	208	435	- -	28	57	96	145	208	472
	Brg	- -	- -	1.5	1.5	1.5	1.5	3.5	- -	1.5	1.5	1.5	1.5	2	4	- -	1.5	1.5	1.5	1.5	2	4.5
30	LL	- -	- -	25	41	61	87	205	- -	- -	37	61	92	131	305	- -	- -	37	61	92	131	304
	TL	- -	- -	33	57	86	125	299	- -	- -	46	77	117	168	379	- -	- -	46	77	117	168	398
	Brg	- -	- -	1.5	1.5	1.5	1.5	3	- -	- -	1.5	1.5	1.5	1.75	3.75	- -	- -	1.5	1.5	1.5	1.75	4

1.5" 2 Ply Stora Enso S-LVL Beam Tables (ASD)
Total Load (PLF) / Live Load (PLF) / Minimum Bearing (IN)

Clear Span		2 Ply LL/360 TL/240 C_D=1.0							2 Ply LL/240 TL/180 C_D=1.15							2 Ply LL/240 TL/180 C_D=1.25						
		7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24
6	LL	1155	2378	3489	4547	5630	6729	9243	1681	2706	3936	5132	6316	7507	9243	1698	2923	4224	5508	6739	8014	9243
	TL	1471	2378	3489	4547	5630	6729	9243	1681	2706	3936	5132	6316	7507	9243	1816	2923	4224	5508	6739	8014	9243
	Brg	1.75	2.75	4.25	6	7.5	9.25	12	2	3.25	5	6.75	8.5	10.5	12	2.25	3.5	5.5	7.25	9.25	11.25	12
8	LL	499	1099	2057	2736	3433	4183	6543	749	1577	2342	3116	3892	4720	7185	749	1623	2534	3355	4190	5058	7185
	TL	745	1378	2057	2736	3433	4183	6543	967	1577	2342	3116	3892	4720	7185	992	1706	2534	3355	4190	5058	7185
	Brg	1.5	2.25	3.25	4.5	5.75	7	12	1.5	2.5	3.75	5	6.5	8	12	1.5	2.75	4	5.5	7	8.75	12
10	LL	258	577	1107	1771	2290	2803	4529	387	861	1538	2065	2603	3187	5091	387	855	1631	2227	2808	3437	5472
	TL	383	860	1315	1809	2290	2803	4529	512	1026	1538	2065	2603	3187	5091	512	1111	1666	2227	2808	3437	5472
	Brg	1.5	1.75	2.5	3.5	4.5	5.75	9.75	1.5	2	3	4	5.25	6.5	11.25	1.5	2.25	3.25	4.5	5.75	7	12
12	LL	150	338	650	1050	1544	2000	3285	225	507	971	1457	1849	2278	3718	225	507	966	1551	2004	2461	4004
	TL	221	502	943	1274	1623	2000	3285	296	662	1082	1457	1849	2278	3718	296	662	1173	1579	2004	2461	4004
	Brg	1.5	1.5	2.25	3	3.75	4.75	8.25	1.5	1.5	2.5	3.5	4.5	5.5	9.5	1.5	1.5	2.75	3.75	4.75	6	10.25
14	LL	95	214	416	673	991	1393	2483	142	321	618	1000	1380	1704	2825	142	321	618	996	1468	1847	3046
	TL	138	315	617	941	1206	1493	2483	186	422	799	1081	1380	1704	2825	186	422	818	1173	1496	1847	3046
	Brg	1.5	1.5	1.75	2.5	3.25	4	7	1.5	1.5	2.25	3	3.75	4.75	8	1.5	1.5	2.25	3.25	4	5	8.75
16	LL	63	143	281	456	674	949	1931	95	215	419	680	1003	1311	2206	95	215	419	677	999	1402	2382
	TL	91	210	414	659	905	1149	1931	123	282	552	824	1065	1311	2206	123	282	552	895	1150	1429	2382
	Brg	1.5	1.5	1.5	2	2.75	3.5	6.25	1.5	1.5	1.75	2.5	3.25	4	7	1.5	1.5	1.75	2.75	3.5	4.5	7.75
18	LL	45	101	197	323	477	672	1544	67	151	296	481	711	1002	1766	67	151	296	481	708	999	1912
	TL	63	146	289	476	706	915	1544	85	197	388	633	845	1049	1766	85	197	388	633	917	1138	1912
	Brg	1.5	1.5	1.5	1.75	2.5	3.25	5.5	1.5	1.5	1.5	2.25	3	3.75	6.25	1.5	1.5	1.5	2.25	3.25	4	6.75
20	LL	32	74	144	236	351	495	1143	49	111	216	354	522	739	1442	49	111	216	354	522	736	1562
	TL	45	105	209	347	517	723	1260	61	142	282	460	686	854	1442	61	142	282	460	687	920	1562
	Brg	1.5	1.5	1.5	1.5	2	2.75	5	1.5	1.5	1.5	1.75	2.75	3.25	5.75	1.5	1.5	1.5	1.75	2.75	3.5	6.25
22	LL	24	55	108	178	265	375	868	37	83	163	267	395	558	1199	37	83	163	267	395	557	1288
	TL	32	78	156	259	388	537	1046	45	105	210	348	518	707	1199	45	105	210	348	518	732	1302
	Brg	1.5	1.5	1.5	1.5	1.75	2.25	4.5	1.5	1.5	1.5	1.5	2.25	3	5.25	1.5	1.5	1.5	1.5	2.25	3.25	5.5
24	LL	- -	42	83	137	205	290	675	28	64	125	206	307	432	1005	28	64	125	206	307	432	1002
	TL	- -	58	118	198	298	425	873	33	80	160	266	382	566	1012	33	80	160	266	382	566	1091
	Brg	- -	1.5	1.5	1.5	1.5	2	4	1.5	1.5	1.5	1.5	1.75	2.75	4.75	1.5	1.5	1.5	1.5	1.75	2.75	5
26	LL	- -	33	66	108	161	229	533	22	50	99	162	242	342	797	22	50	99	162	242	342	793
	TL	- -	45	92	154	233	333	753	25	62	125	208	300	446	856	25	62	125	208	300	446	938
	Brg	- -	1.5	1.5	1.5	1.5	1.75	3.75	1.5	1.5	1.5	1.5	1.5	2.25	4.25	1.5	1.5	1.5	1.5	1.5	2.25	4.75
28	LL	- -	27	52	86	129	184	429	- -	40	79	130	194	275	641	- -	40	79	130	194	275	638
	TL	- -	35	72	122	184	266	630	- -	48	98	165	249	356	746	- -	48	98	165	249	356	810
	Brg	- -	1.5	1.5	1.5	1.5	1.5	3.5	- -	1.5	1.5	1.5	1.5	2	4	- -	1.5	1.5	1.5	1.5	2	4.5
30	LL	- -	22	43	70	105	150	351	- -	33	64	105	158	224	523	- -	33	64	105	158	224	522
	TL	- -	27	57	97	148	214	513	- -	38	79	133	201	289	650	- -	38	79	133	201	289	683
	Brg	- -	1.5	1.5	1.5	1.5	1.5	3	- -	1.5	1.5	1.5	1.5	1.75	3.75	- -	1.5	1.5	1.5	1.5	1.75	4

1.75" 2 Ply Stora Enso S-LVL Beam Tables (ASD)
Total Load (PLF) / Live Load (PLF) / Minimum Bearing (IN)

Clear Span		2 Ply LL/360 TL/240 C_D=1.0							2 Ply LL/240 TL/180 C_D =1.15							2 Ply LL/240 TL/180 C_D =1.25						
		7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24
6	LL	1347	2774	4071	5305	6568	7851	10783	1962	3158	4592	5987	7368	8758	10783	1981	3410	4928	6426	7863	9350	10783
	TL	1717	2774	4071	5305	6568	7851	10783	1962	3158	4592	5987	7368	8758	10783	2118	3410	4928	6426	7863	9350	10783
	Brg	1.75	2.75	4.25	6	7.5	9.25	12	2	3.25	5	6.75	8.5	10.5	12	2.25	3.5	5.5	7.25	9.25	11.25	12
8	LL	583	1282	2399	3192	4005	4880	7633	874	1840	2733	3636	4540	5506	8383	874	1894	2956	3914	4888	5901	8383
	TL	869	1607	2399	3192	4005	4880	7633	1128	1840	2733	3636	4540	5506	8383	1158	1990	2956	3914	4888	5901	8383
	Brg	1.5	2.25	3.25	4.5	5.75	7	12	1.5	2.5	3.75	5	6.5	8	12	1.5	2.75	4	5.5	7	8.75	12
10	LL	301	673	1292	2066	2671	3270	5283	452	1004	1794	2409	3037	3718	5940	452	998	1903	2598	3276	4010	6384
	TL	447	1004	1534	2110	2671	3270	5283	597	1197	1794	2409	3037	3718	5940	597	1296	1943	2598	3276	4010	6384
	Brg	1.5	1.75	2.5	3.5	4.5	5.75	9.75	1.5	2	3	4	5.25	6.5	11.25	1.5	2.25	3.25	4.5	5.75	7	12
12	LL	175	394	759	1225	1801	2333	3833	263	592	1133	1699	2157	2658	4338	263	592	1127	1810	2338	2871	4671
	TL	258	585	1100	1487	1893	2333	3833	346	772	1262	1699	2157	2658	4338	346	772	1368	1842	2338	2871	4671
	Brg	1.5	1.5	2.25	3	3.75	4.75	8.25	1.5	1.5	2.5	3.5	4.5	5.5	9.5	1.5	1.5	2.75	3.75	4.75	6	10.25
14	LL	111	249	485	785	1157	1625	2897	166	374	722	1167	1610	1988	3296	166	374	722	1162	1712	2155	3553
	TL	161	368	720	1098	1407	1742	2897	217	493	932	1262	1610	1988	3296	217	493	954	1368	1746	2155	3553
	Brg	1.5	1.5	1.75	2.5	3.25	4	7	1.5	1.5	2.25	3	3.75	4.75	8	1.5	1.5	2.25	3.25	4	5	8.75
16	LL	74	167	327	533	786	1107	2253	111	251	489	793	1171	1530	2574	111	251	489	790	1166	1635	2779
	TL	106	245	483	769	1056	1341	2253	144	329	645	962	1243	1530	2574	144	329	645	1044	1342	1668	2779
	Brg	1.5	1.5	1.5	2	2.75	3.5	6.25	1.5	1.5	1.75	2.5	3.25	4	7	1.5	1.5	1.75	2.75	3.5	4.5	7.75
18	LL	52	118	230	377	557	785	1802	78	177	346	561	829	1169	2061	78	177	346	561	827	1165	2231
	TL	73	170	338	556	824	1067	1802	100	229	453	739	986	1223	2061	100	229	453	739	1070	1328	2231
	Brg	1.5	1.5	1.5	1.75	2.5	3.25	5.5	1.5	1.5	1.5	2.25	3	3.75	6.25	1.5	1.5	1.5	2.25	3.25	4	6.75
20	LL	38	86	168	276	410	578	1333	57	129	253	413	609	862	1682	57	129	253	413	609	859	1822
	TL	52	123	244	405	604	844	1470	71	166	329	537	800	996	1682	71	166	329	537	801	1074	1822
	Brg	1.5	1.5	1.5	1.5	2	2.75	5	1.5	1.5	1.5	1.75	2.75	3.25	5.75	1.5	1.5	1.5	1.75	2.75	3.5	6.25
22	LL	28	64	126	208	309	438	1013	43	97	190	312	461	652	1399	43	97	190	312	461	650	1502
	TL	38	91	182	302	453	626	1221	52	123	245	406	604	825	1399	52	123	245	406	604	854	1519
	Brg	1.5	1.5	1.5	1.5	1.75	2.25	4.5	1.5	1.5	1.5	1.5	2.25	3	5.25	1.5	1.5	1.5	1.5	2.25	3.25	5.5
24	LL	22	50	97	160	239	339	787	33	75	146	240	358	504	1172	33	75	146	240	358	504	1169
	TL	28	68	138	231	348	496	1019	39	93	187	311	445	660	1180	39	93	187	311	445	660	1273
	Brg	1.5	1.5	1.5	1.5	1.5	2	4	1.5	1.5	1.5	1.5	1.75	2.75	4.75	1.5	1.5	1.5	1.5	1.75	2.75	5
26	LL	- -	39	77	126	188	267	622	26	59	115	189	282	399	930	26	59	115	189	282	399	925
	TL	- -	52	107	179	271	389	878	30	72	146	243	350	520	999	30	72	146	243	350	520	1095
	Brg	- -	1.5	1.5	1.5	1.5	1.75	3.75	1.5	1.5	1.5	1.5	1.5	2.25	4.25	1.5	1.5	1.5	1.5	1.5	2.25	4.75
28	LL	- -	31	61	101	151	215	501	21	47	92	151	226	321	748	21	47	92	151	226	321	745
	TL	- -	40	84	142	215	310	735	23	56	115	192	291	416	871	23	56	115	192	291	416	945
	Brg	- -	1.5	1.5	1.5	1.5	1.5	3.5	1.5	1.5	1.5	1.5	1.5	2	4	1.5	1.5	1.5	1.5	1.5	2	4.5
30	LL	- -	25	50	82	123	175	410	- -	38	75	123	184	262	611	- -	38	75	123	184	262	609
	TL	- -	32	67	114	173	250	598	- -	45	92	155	235	337	759	- -	45	92	155	235	337	796
	Brg	- -	1.5	1.5	1.5	1.5	1.5	3	- -	1.5	1.5	1.5	1.5	1.75	3.75	- -	1.5	1.5	1.5	1.5	1.75	4

1.5" 3 Ply Stora Enso S-LVL Beam Tables (ASD)
Total Load (PLF) / Live Load (PLF) / Minimum Bearing (IN)

Clear Span		3 Ply LL/360 TL/240 C_D=1.0							3 Ply LL/240 TL/180 C_D=1.15							3 Ply LL/240 TL/180 C_D=1.25						
		7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24
6	LL	1732	3695	5409	7049	8728	10434	13864	2572	4195	6101	7955	9732	11641	13864	2547	4530	6547	8486	10386	12354	13864
	TL	2296	3695	5409	7049	8728	10434	13864	2620	4195	6101	7955	9732	11641	13864	2833	4530	6547	8486	10386	12354	13864
	Brg	1.75	3	4.5	6.25	7.75	9.5	12	2	3.5	5.25	7	9	10.75	12	2.25	3.75	5.75	7.75	9.75	11.75	12
8	LL	749	1648	3100	4269	5330	6495	10208	1124	2454	3636	4838	6042	7293	10778	1124	2435	3934	5208	6505	7853	10778
	TL	1118	2150	3193	4269	5330	6495	10208	1489	2458	3636	4838	6042	7293	10778	1489	2662	3934	5208	6505	7853	10778
	Brg	1.5	2.25	3.5	4.5	6	7.25	12	1.5	2.5	4	5.25	6.75	8.5	12	1.5	2.75	4.25	5.75	7.25	9	12
10	LL	387	866	1651	2641	3558	4356	7011	581	1291	2360	3208	4045	4952	7883	581	1283	2432	3474	4363	5342	8538
	TL	574	1291	2094	2811	3558	4356	7011	768	1585	2360	3208	4045	4952	7883	768	1703	2588	3474	4363	5342	8538
	Brg	1.5	1.75	2.75	3.75	4.75	6	10.25	1.5	2	3	4.25	5.5	6.75	11.75	1.5	2.25	3.5	4.5	6	7.25	12
12	LL	225	507	976	1575	2304	3110	5109	338	761	1457	2273	2885	3543	5783	338	761	1449	2327	3116	3827	6226
	TL	332	753	1454	1971	2524	3110	5109	444	993	1648	2273	2885	3543	5783	444	993	1811	2454	3116	3827	6226
	Brg	1.5	1.5	2.25	3	4	5	8.5	1.5	1.5	2.5	3.5	4.5	5.75	9.75	1.5	1.5	2.75	3.75	5	6.25	10.5
14	LL	142	321	624	1005	1481	2081	3863	214	481	928	1501	2147	2656	4383	214	481	928	1494	2192	2874	4739
	TL	207	473	926	1470	1876	2323	3863	279	633	1227	1688	2147	2656	4383	279	633	1227	1830	2328	2874	4739
	Brg	1.5	1.5	1.75	2.75	3.5	4.25	7.25	1.5	1.5	2.25	3	4	4.75	8.5	1.5	1.5	2.25	3.25	4.25	5.25	9
16	LL	95	215	421	685	1007	1418	3007	143	323	629	1016	1499	2056	3435	143	323	629	1016	1494	2095	3707
	TL	137	315	621	989	1448	1795	3007	185	423	829	1298	1659	2056	3435	185	423	829	1342	1799	2225	3707
	Brg	1.5	1.5	1.5	2	3	3.75	6.5	1.5	1.5	1.75	2.75	3.5	4.25	7.25	1.5	1.5	1.75	2.75	3.75	4.75	8
18	LL	67	151	296	484	716	1009	2312	101	227	445	722	1066	1503	2750	101	227	445	722	1063	1498	2978
	TL	94	219	434	714	1060	1425	2405	128	295	583	950	1317	1637	2750	128	295	583	950	1403	1751	2978
	Brg	1.5	1.5	1.5	1.75	2.5	3.25	5.75	1.5	1.5	1.5	2.25	3	3.75	6.5	1.5	1.5	1.5	2.25	3.25	4	7
20	LL	49	111	216	355	527	743	1714	74	166	325	531	783	1105	2250	74	166	325	531	783	1101	2433
	TL	67	158	314	520	776	1085	1962	92	213	423	691	1030	1330	2250	92	213	423	691	1030	1444	2433
	Brg	1.5	1.5	1.5	1.5	2	2.75	5	1.5	1.5	1.5	1.75	2.75	3.5	5.75	1.5	1.5	1.5	1.75	2.75	3.75	6.5
22	LL	37	83	163	267	398	563	1299	55	125	244	401	593	838	1871	55	125	244	401	593	835	1926
	TL	49	117	234	388	583	805	1630	67	158	315	522	777	1076	1871	67	158	315	522	777	1098	2028
	Brg	1.5	1.5	1.5	1.5	1.75	2.25	4.75	1.5	1.5	1.5	1.5	2.25	3	5.25	1.5	1.5	1.5	1.5	2.25	3.25	5.75
24	LL	28	64	125	206	307	436	1010	42	96	188	309	460	649	1503	42	96	188	309	460	649	1499
	TL	36	88	178	297	447	638	1375	50	120	241	400	573	849	1577	50	120	241	400	573	849	1713
	Brg	1.5	1.5	1.5	1.5	1.5	2	4.25	1.5	1.5	1.5	1.5	1.75	2.75	5	1.5	1.5	1.5	1.5	1.75	2.75	5.25
26	LL	22	50	99	162	242	344	799	33	76	148	243	363	514	1192	33	76	148	243	363	514	1187
	TL	27	67	138	231	349	500	1173	38	93	187	312	451	669	1348	38	93	187	312	451	669	1463
	Brg	1.5	1.5	1.5	1.5	1.5	1.75	4	1.5	1.5	1.5	1.5	1.5	2.25	4.5	1.5	1.5	1.5	1.5	1.5	2.25	5
28	LL	- -	40	79	130	194	276	644	27	61	119	195	291	413	960	27	61	119	195	291	413	958
	TL	- -	52	108	183	277	399	945	29	73	148	248	374	535	1164	29	73	148	248	374	535	1256
	Brg	- -	1.5	1.5	1.5	1.5	1.5	3.5	1.5	1.5	1.5	1.5	1.5	2	4.25	1.5	1.5	1.5	1.5	1.5	2	4.5
30	LL	- -	33	64	105	158	225	527	22	49	96	158	237	337	784	22	49	96	158	237	337	784
	TL	- -	41	86	146	223	321	769	23	57	118	199	302	433	1014	23	57	118	199	302	433	1024
	Brg	- -	1.5	1.5	1.5	1.5	1.5	3	1.5	1.5	1.5	1.5	1.5	1.75	4	1.5	1.5	1.5	1.5	1.5	1.75	4

1.75" 3 Ply Stora Enso S-LVL Beam Tables (ASD)
Total Load (PLF) / Live Load (PLF) / Minimum Bearing (IN)

Clear Span		3 Ply LL/360 TL/240 C_D=1.0							3 Ply LL/240 TL/180 C_D=1.15							3 Ply LL/240 TL/180 C_D=1.25						
		7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24
6	LL	2021	4311	6310	8224	10183	12173	16175	3001	4894	7118	9281	11354	13581	16175	2971	5285	7639	9900	12117	14413	16175
	TL	2679	4311	6310	8224	10183	12173	16175	3057	4894	7118	9281	11354	13581	16175	3305	5285	7639	9900	12117	14413	16175
	Brg	1.75	3	4.5	6.25	7.75	9.5	12	2	3.5	5.25	7	9	10.75	12	2.25	3.75	5.75	7.75	9.75	11.75	12
8	LL	874	1923	3617	4980	6218	7577	11909	1312	2863	4243	5644	7049	8509	12575	1312	2841	4590	6076	7590	9162	12575
	TL	1304	2508	3725	4980	6218	7577	11909	1737	2868	4243	5644	7049	8509	12575	1737	3106	4590	6076	7590	9162	12575
	Brg	1.5	2.25	3.5	4.5	6	7.25	12	1.5	2.5	4	5.25	6.75	8.5	12	1.5	2.75	4.25	5.75	7.25	9	12
10	LL	452	1010	1926	3081	4152	5082	8180	678	1507	2753	3743	4720	5778	9197	678	1497	2837	4054	5091	6232	9961
	TL	670	1506	2443	3279	4152	5082	8180	896	1849	2753	3743	4720	5778	9197	896	1987	3020	4054	5091	6232	9961
	Brg	1.5	1.75	2.75	3.75	4.75	6	10.25	1.5	2	3	4.25	5.5	6.75	11.75	1.5	2.25	3.5	4.5	6	7.25	12
12	LL	263	592	1139	1838	2688	3629	5960	394	888	1700	2652	3366	4134	6747	394	888	1691	2715	3636	4465	7264
	TL	387	878	1696	2299	2945	3629	5960	519	1159	1922	2652	3366	4134	6747	519	1159	2112	2863	3636	4465	7264
	Brg	1.5	1.5	2.25	3	4	5	8.5	1.5	1.5	2.5	3.5	4.5	5.75	9.75	1.5	1.5	2.75	3.75	5	6.25	10.5
14	LL	166	374	728	1172	1727	2428	4507	249	561	1083	1751	2505	3099	5114	249	561	1083	1744	2558	3353	5529
	TL	242	552	1080	1716	2189	2710	4507	325	739	1432	1969	2505	3099	5114	325	739	1432	2136	2716	3353	5529
	Brg	1.5	1.5	1.75	2.75	3.5	4.25	7.25	1.5	1.5	2.25	3	4	4.75	8.5	1.5	1.5	2.25	3.25	4.25	5.25	9
16	LL	111	251	491	799	1175	1654	3508	167	377	734	1185	1749	2399	4007	167	377	734	1185	1743	2444	4325
	TL	160	368	725	1154	1689	2094	3508	216	493	967	1515	1935	2399	4007	216	493	967	1566	2099	2596	4325
	Brg	1.5	1.5	1.5	2	3	3.75	6.5	1.5	1.5	1.75	2.75	3.5	4.25	7.25	1.5	1.5	1.75	2.75	3.75	4.75	8
18	LL	78	177	346	565	835	1177	2697	118	265	519	842	1244	1754	3208	118	265	519	842	1240	1748	3474
	TL	110	256	507	834	1236	1662	2806	150	344	680	1109	1537	1910	3208	150	344	680	1109	1637	2043	3474
	Brg	1.5	1.5	1.5	1.75	2.5	3.25	5.75	1.5	1.5	1.5	2.25	3	3.75	6.5	1.5	1.5	1.5	2.25	3.25	4	7
20	LL	57	129	253	414	615	867	2000	86	194	379	619	913	1289	2626	86	194	379	619	913	1285	2839
	TL	78	184	367	607	906	1266	2289	107	249	493	806	1202	1552	2626	107	249	493	806	1202	1685	2839
	Brg	1.5	1.5	1.5	1.5	2	2.75	5	1.5	1.5	1.5	1.75	2.75	3.5	5.75	1.5	1.5	1.5	1.75	2.75	3.75	6.5
22	LL	43	97	190	312	464	657	1515	64	146	285	468	692	978	2183	64	146	285	468	692	975	2248
	TL	57	136	273	453	680	939	1902	79	185	368	609	907	1255	2183	79	185	368	609	907	1281	2366
	Brg	1.5	1.5	1.5	1.5	1.75	2.25	4.75	1.5	1.5	1.5	1.5	2.25	3	5.25	1.5	1.5	1.5	1.5	2.25	3.25	5.75
24	LL	33	75	146	240	359	508	1178	50	112	220	360	537	757	1754	50	112	220	360	537	757	1749
	TL	42	103	208	346	522	744	1605	59	140	281	466	668	991	1840	59	140	281	466	668	991	1998
	Brg	1.5	1.5	1.5	1.5	1.5	2	4.25	1.5	1.5	1.5	1.5	1.75	2.75	5	1.5	1.5	1.5	1.5	1.75	2.75	5.25
26	LL	26	59	115	189	282	401	932	39	88	173	284	424	599	1391	39	88	173	284	424	599	1385
	TL	32	79	161	269	407	584	1369	45	108	219	364	526	781	1573	45	108	219	364	526	781	1706
	Brg	1.5	1.5	1.5	1.5	1.5	1.75	4	1.5	1.5	1.5	1.5	1.5	2.25	4.5	1.5	1.5	1.5	1.5	1.5	2.25	5
28	LL	21	47	92	151	226	322	751	31	71	139	227	340	482	1120	31	71	139	227	340	482	1117
	TL	24	61	126	213	323	465	1103	34	85	173	289	437	624	1358	34	85	173	289	437	624	1465
	Brg	1.5	1.5	1.5	1.5	1.5	1.5	3.5	1.5	1.5	1.5	1.5	1.5	2	4.25	1.5	1.5	1.5	1.5	1.5	2	4.5
30	LL	- -	38	75	123	184	262	615	25	57	113	185	276	393	914	25	57	113	185	276	393	914
	TL	- -	48	100	171	260	375	897	26	67	138	232	352	505	1183	26	67	138	232	352	505	1195
	Brg	- -	1.5	1.5	1.5	1.5	1.5	3	1.5	1.5	1.5	1.5	1.5	1.75	4	1.5	1.5	1.5	1.5	1.5	1.75	4

1.5" 4 Ply Stora Enso S-LVL Beam Tables (ASD)
Total Load (PLF) / Live Load (PLF) / Minimum Bearing (IN)

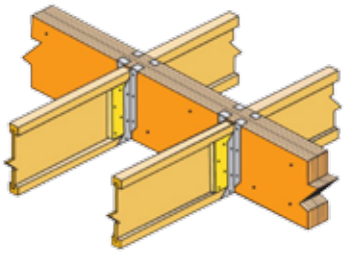
Clear Span		4 Ply LL/360 TL/240 Cd=1.0							4 Ply LL/240 TL/180 Cd=1.15							4 Ply LL/240 TL/180 Cd=1.25						
		7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24
6	LL	2310	4927	7212	9399	11638	13912	18486	3430	5593	8135	10607	12976	15521	18486	3396	6040	8730	11315	13848	16472	18486
	TL	3061	4927	7212	9399	11638	13912	18486	3494	5593	8135	10607	12976	15521	18486	3777	6040	8730	11315	13848	16472	18486
	Brg	1.75	3	4.5	6.25	7.75	9.5	12	2	3.5	5.25	7	9	10.75	12	2.25	3.75	5.75	7.75	9.75	11.75	12
8	LL	999	2198	4134	5692	7107	8660	13610	1499	3272	4849	6451	8057	9725	14371	1499	3247	5245	6944	8674	10471	14371
	TL	1491	2866	4257	5692	7107	8660	13610	1985	3278	4849	6451	8057	9725	14371	1985	3549	5245	6944	8674	10471	14371
	Brg	1.5	2.25	3.5	4.5	6	7.25	12	1.5	2.5	4	5.25	6.75	8.5	12	1.5	2.75	4.25	5.75	7.25	9	12
10	LL	516	1155	2201	3521	4745	5808	9349	775	1722	3147	4278	5394	6603	10511	775	1711	3243	4633	5818	7123	11384
	TL	766	1721	2792	3748	4745	5808	9349	1024	2113	3147	4278	5394	6603	10511	1024	2271	3451	4633	5818	7123	11384
	Brg	1.5	1.75	2.75	3.75	4.75	6	10.25	1.5	2	3	4.25	5.5	6.75	11.75	1.5	2.25	3.5	4.5	6	7.25	12
12	LL	300	676	1301	2100	3072	4147	6812	451	1015	1942	3031	3847	4724	7711	451	1015	1932	3103	4155	5103	8302
	TL	442	1004	1938	2628	3366	4147	6812	593	1324	2197	3031	3847	4724	7711	593	1324	2414	3272	4155	5103	8302
	Brg	1.5	1.5	2.25	3	4	5	8.5	1.5	1.5	2.5	3.5	4.5	5.75	9.75	1.5	1.5	2.75	3.75	5	6.25	10.5
14	LL	190	428	832	1340	1974	2775	5151	285	642	1237	2001	2863	3542	5844	285	642	1237	1993	2923	3833	6319
	TL	276	631	1235	1961	2501	3098	5151	372	845	1636	2251	2863	3542	5844	372	845	1636	2441	3104	3833	6319
	Brg	1.5	1.5	1.75	2.75	3.5	4.25	7.25	1.5	1.5	2.25	3	4	4.75	8.5	1.5	1.5	2.25	3.25	4.25	5.25	9
16	LL	127	287	562	913	1343	1890	4009	191	431	839	1355	1999	2742	4580	191	431	839	1355	1992	2793	4943
	TL	183	420	829	1319	1931	2394	4009	247	564	1105	1731	2212	2742	4580	247	564	1105	1790	2399	2967	4943
	Brg	1.5	1.5	1.5	2	3	3.75	6.5	1.5	1.5	1.75	2.75	3.5	4.25	7.25	1.5	1.5	1.75	2.75	3.75	4.75	8
18	LL	90	202	395	646	954	1345	3083	135	303	593	962	1422	2004	3667	135	303	593	962	1417	1998	3970
	TL	126	292	579	953	1413	1900	3207	171	394	777	1267	1756	2182	3667	171	394	777	1267	1871	2335	3970
	Brg	1.5	1.5	1.5	1.75	2.5	3.25	5.75	1.5	1.5	1.5	2.25	3	3.75	6.5	1.5	1.5	1.5	2.25	3.25	4	7
20	LL	65	148	289	473	702	991	2286	98	222	433	708	1044	1473	3001	98	222	433	708	1044	1469	3244
	TL	90	210	419	694	1035	1447	2616	123	284	564	921	1374	1773	3001	123	284	564	921	1374	1926	3244
	Brg	1.5	1.5	1.5	1.5	2	2.75	5	1.5	1.5	1.5	1.75	2.75	3.5	5.75	1.5	1.5	1.5	1.75	2.75	3.75	6.5
22	LL	49	111	217	356	530	751	1732	74	167	326	534	791	1117	2495	74	167	326	534	791	1114	2569
	TL	65	156	312	518	777	1074	2174	90	211	421	696	1036	1435	2495	90	211	421	696	1036	1465	2704
	Brg	1.5	1.5	1.5	1.5	1.75	2.25	4.75	1.5	1.5	1.5	1.5	2.25	3	5.25	1.5	1.5	1.5	1.5	2.25	3.25	5.75
24	LL	38	85	167	275	410	581	1346	57	128	251	412	614	865	2004	57	128	251	412	614	865	1999
	TL	48	117	237	396	597	851	1834	67	160	321	533	764	1133	2102	67	160	321	533	764	1133	2284
	Brg	1.5	1.5	1.5	1.5	1.5	2	4.25	1.5	1.5	1.5	1.5	1.75	2.75	5	1.5	1.5	1.5	1.5	1.75	2.75	5.25
26	LL	30	67	132	216	323	459	1065	45	101	198	324	484	685	1590	45	101	198	324	484	685	1583
	TL	36	90	184	308	466	667	1565	51	124	250	416	601	893	1798	51	124	250	416	601	893	1950
	Brg	1.5	1.5	1.5	1.5	1.5	1.75	4	1.5	1.5	1.5	1.5	1.5	2.25	4.5	1.5	1.5	1.5	1.5	1.5	2.25	5
28	LL	24	54	105	173	259	368	859	36	81	158	260	388	550	1280	36	81	158	260	388	550	1277
	TL	27	70	145	244	369	532	1260	39	97	197	330	499	713	1552	39	97	197	330	499	713	1675
	Brg	1.5	1.5	1.5	1.5	1.5	1.5	3.5	1.5	1.5	1.5	1.5	1.5	2	4.25	1.5	1.5	1.5	1.5	1.5	2	4.5
30	LL	- -	44	86	141	210	300	702	29	66	129	211	316	449	1045	29	66	129	211	316	449	1045
	TL	- -	55	115	195	297	429	1026	30	77	158	266	403	578	1352	30	77	158	266	403	578	1366
	Brg	- -	1.5	1.5	1.5	1.5	1.5	3	1.5	1.5	1.5	1.5	1.5	1.75	4	1.5	1.5	1.5	1.5	1.5	1.75	4

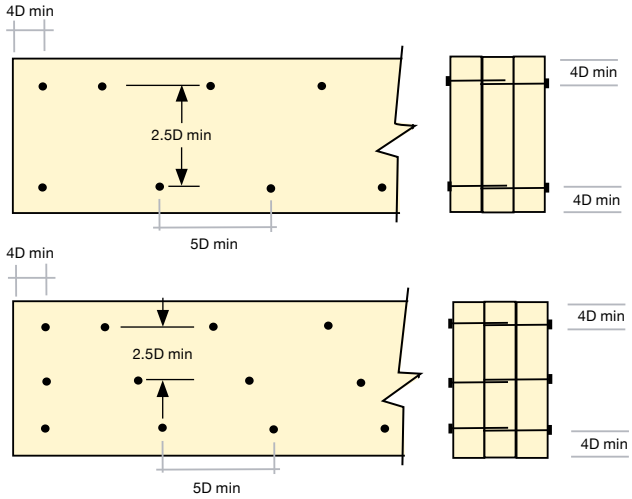
1.75" 4 Ply Stora Enso S-LVL Beam Tables (ASD)
Total Load (PLF) / Live Load (PLF) / Minimum Bearing (IN)

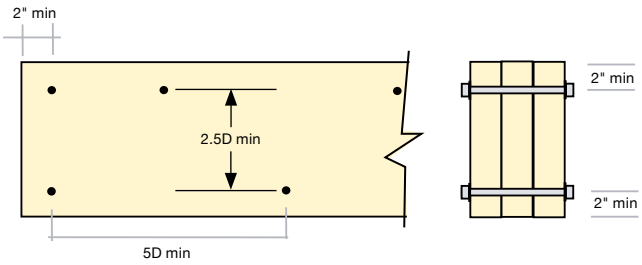
Clear Span		4 Ply LL/360 TL/240 C_D=1.0							4 Ply LL/240 TL/180 C_D=1.15							4 Ply LL/240 TL/180 C_D=1.25						
		7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24	7.25	9.5	11.875	14	16	18	24
6	LL	2695	5748	8414	10966	13577	16230	21567	4002	6525	9491	12375	15138	18108	21567	3962	7047	10185	13201	16156	19217	21567
	TL	3572	5748	8414	10966	13577	16230	21567	4076	6525	9491	12375	15138	18108	21567	4407	7047	10185	13201	16156	19217	21567
	Brg	1.75	3	4.5	6.25	7.75	9.5	12	2	3.5	5.25	7	9	10.75	12	2.25	3.75	5.75	7.75	9.75	11.75	12
8	LL	1166	2564	4823	6640	8291	10103	15879	1749	3818	5657	7526	9399	11345	16767	1749	3789	6120	8102	10120	12217	16767
	TL	1739	3344	4967	6640	8291	10103	15879	2316	3824	5657	7526	9399	11345	16767	2316	4141	6120	8102	10120	12217	16767
	Brg	1.5	2.25	3.5	4.5	6	7.25	12	1.5	2.5	4	5.25	6.75	8.5	12	1.5	2.75	4.25	5.75	7.25	9	12
10	LL	602	1347	2568	4108	5536	6776	10907	904	2009	3671	4991	6293	7704	12263	904	1997	3783	5405	6788	8310	13282
	TL	894	2008	3258	4373	5536	6776	10907	1195	2465	3671	4991	6293	7704	12263	1195	2649	4027	5405	6788	8310	13282
	Brg	1.5	1.75	2.75	3.75	4.75	6	10.25	1.5	2	3	4.25	5.5	6.75	11.75	1.5	2.25	3.5	4.5	6	7.25	12
12	LL	351	789	1518	2450	3584	4838	7947	526	1184	2266	3536	4488	5512	8996	526	1184	2255	3620	4848	5953	9686
	TL	516	1171	2262	3066	3927	4838	7947	692	1545	2563	3536	4488	5512	8996	692	1545	2817	3818	4848	5953	9686
	Brg	1.5	1.5	2.25	3	4	5	8.5	1.5	1.5	2.5	3.5	4.5	5.75	9.75	1.5	1.5	2.75	3.75	5	6.25	10.5
14	LL	222	499	971	1563	2303	3237	6010	333	749	1444	2335	3340	4132	6818	333	749	1444	2325	3411	4471	7372
	TL	323	736	1440	2288	2918	3614	6010	434	986	1909	2626	3340	4132	6818	434	986	1909	2848	3622	4471	7372
	Brg	1.5	1.5	1.75	2.75	3.5	4.25	7.25	1.5	1.5	2.25	3	4	4.75	8.5	1.5	1.5	2.25	3.25	4.25	5.25	9
16	LL	149	335	655	1066	1567	2206	4677	223	503	979	1581	2333	3199	5343	223	503	979	1581	2324	3258	5767
	TL	213	490	967	1539	2252	2793	4677	288	658	1290	2020	2580	3199	5343	288	658	1290	2088	2799	3461	5767
	Brg	1.5	1.5	1.5	2	3	3.75	6.5	1.5	1.5	1.75	2.75	3.5	4.25	7.25	1.5	1.5	1.75	2.75	3.75	4.75	8
18	LL	105	236	461	754	1114	1570	3597	157	354	692	1123	1659	2339	4278	157	354	692	1123	1654	2331	4632
	TL	147	341	676	1112	1649	2216	3741	200	459	907	1478	2049	2546	4278	200	459	907	1478	2183	2724	4632
	Brg	1.5	1.5	1.5	1.75	2.5	3.25	5.75	1.5	1.5	1.5	2.25	3	3.75	6.5	1.5	1.5	1.5	2.25	3.25	4	7
20	LL	76	172	337	552	820	1156	2667	115	259	506	826	1218	1719	3501	115	259	506	826	1218	1713	3785
	TL	105	246	489	810	1208	1688	3052	143	332	658	1075	1603	2069	3501	143	332	658	1075	1603	2247	3785
	Brg	1.5	1.5	1.5	1.5	2	2.75	5	1.5	1.5	1.5	1.75	2.75	3.5	5.75	1.5	1.5	1.5	1.75	2.75	3.75	6.5
22	LL	57	129	253	416	619	876	2020	86	194	380	624	923	1304	2911	86	194	380	624	923	1300	2997
	TL	76	182	364	604	907	1253	2536	105	246	491	812	1209	1674	2911	105	246	491	812	1209	1709	3155
	Brg	1.5	1.5	1.5	1.5	1.75	2.25	4.75	1.5	1.5	1.5	1.5	2.25	3	5.25	1.5	1.5	1.5	1.5	2.25	3.25	5.75
24	LL	44	100	195	320	478	678	1571	66	150	293	481	716	1009	2339	66	150	293	481	716	1009	2333
	TL	56	137	277	462	696	993	2140	79	187	375	622	891	1321	2453	79	187	375	622	891	1321	2665
	Brg	1.5	1.5	1.5	1.5	1.5	2	4.25	1.5	1.5	1.5	1.5	1.75	2.75	5	1.5	1.5	1.5	1.5	1.75	2.75	5.25
26	LL	35	78	154	252	377	535	1243	52	118	231	379	565	799	1855	52	118	231	379	565	799	1846
	TL	42	105	215	359	543	779	1825	60	144	292	486	701	1041	2097	60	144	292	486	701	1041	2275
	Brg	1.5	1.5	1.5	1.5	1.5	1.75	4	1.5	1.5	1.5	1.5	1.5	2.25	4.5	1.5	1.5	1.5	1.5	1.5	2.25	5
28	LL	28	63	123	202	302	430	1002	42	94	185	303	453	642	1493	42	94	185	303	453	642	1490
	TL	32	81	169	284	431	621	1470	46	113	230	385	582	832	1810	46	113	230	385	582	832	1954
	Brg	1.5	1.5	1.5	1.5	1.5	1.5	3.5	1.5	1.5	1.5	1.5	1.5	2	4.25	1.5	1.5	1.5	1.5	1.5	2	4.5
30	LL	22	51	100	164	246	350	820	34	77	150	247	369	524	1219	34	77	150	247	369	524	1219
	TL	24	64	134	228	347	500	1197	35	90	184	310	470	674	1578	35	90	184	310	470	674	1593
	Brg	1.5	1.5	1.5	1.5	1.5	1.5	3	1.5	1.5	1.5	1.5	1.5	1.75	4	1.5	1.5	1.5	1.5	1.5	1.75	4

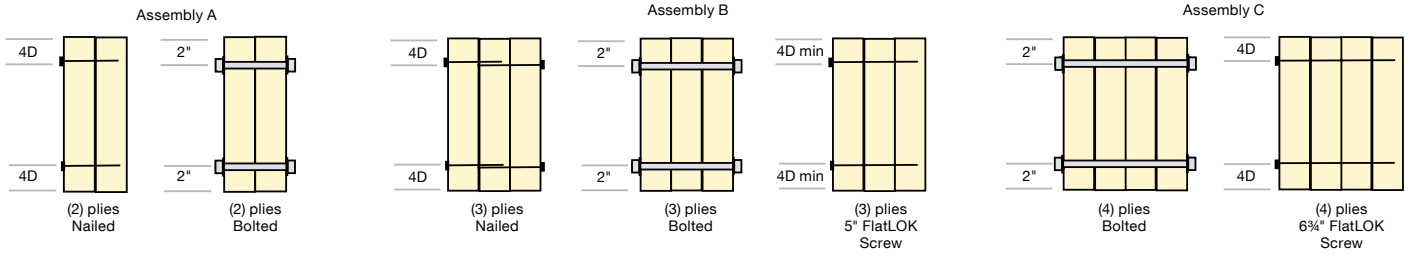
Multiple Ply Beams

Joist applied to one or both sides of the beam.









Maximum Uniformly Distributed Load (PLF) That Can Be Applied to Either Side Of the Beam													
Assembly Detail (See Figures 1-3)	**Ply Thickness**	**2 Rows of 16d (0.162x3½") Nails at 12" o.c.**	**3 Rows of 16d (0.162x3½") Nails at 12" o.c.**	**2 Rows of 12d (0.148x3¼") Nails at 12" o.c.**	**3 Rows of 12d (0.148x3¼") Nails at 12" o.c.**	**2 Rows of 10d (0.131x3") Nails at 12" o.c.**	**3 Rows of 10d (0.131x3") Nails at 12" o.c.**	**2 Rows of F4.5FL (0.227x4½") Screws at 12" o.c.**	**3 Rows of F4.5FL (0.227x4½") Screws at 12" o.c.**	**2 Rows of F6.0FL (0.227x6") Screws at 12" o.c.**	**3 Rows of F6.0FL (0.227x6") Screws at 12" o.c.**	**2 Rows of 1/2" Bolts at 12" o.c.**	**3 Rows of 1/2" Bolts at 12" o.c.**
A	**1.5"**	563	844	470	705	368	552					748	1123
	1.75"	563	844	470	705	368	552					873	1310
B	**1.5"**	422	633	352	528	276	414	621	931			561	842
	1.75"	422	633	352	528	276	414	621	931			655	982
C	**1.5"**									552	827	499	748
	1.75"									552	827	582	873

1. Multiply the appropriate table value by:
   a. 1.5 for nails or bolts spaced at 8" o.c. (203 mm) per row
   b. 2 for nails or bolts spaced at 6" o.c. (152 mm) per row
   c. 3 for nails or bolts spaced at 4" o.c. (102 mm) per row
   d. 0.5 for bolts spaced at 24" o.c. (610 mm) per row
2. Determine the appropriate beam size required to support the load before determining the connection requirements.
3. Screws can be used in place of bolts, provided additional fasteners are used such that the sum of the screw capacities is equal to or greater than that of the 1/2" diameter bolts (12.7mm). Refer to the screw manufacturer's literature.
4. Tabulated values assume adequate end distance, edge distance and spacing per NDS, as applicable.
5. Tabulated values are for normal load duration. Adjustment of the design stresses for duration of load shall be in accordance with the applicable code, NDS, as applicable.
6. For beams greater than 4-plies wide, consult a registered design professional for the attachment requirements.
7. A standard cut steel washer of minimum 0.109" thickness (2.8 mm), with a minimum outside dimension of $1^{3}/_{8}$" (35 mm), is required on each side of the beam between the wood and bolt head and nut.
8. Bolted connections assume full diameter bolts with bending yield strength (F_{yb}) of 45,000 psi (310 MPa).
9. Nailing is required from both sides for 3-ply beams.
10. Screw connections assume bending yield strength (F_{yb}) of 171,600 psi (1,180 MPa).
11. Screws can be used in place of FastenMaster FlatLOK, provided the screw capacities are equal to or greater than that of the specified screw. Refer to the screw manufacturer's literature.

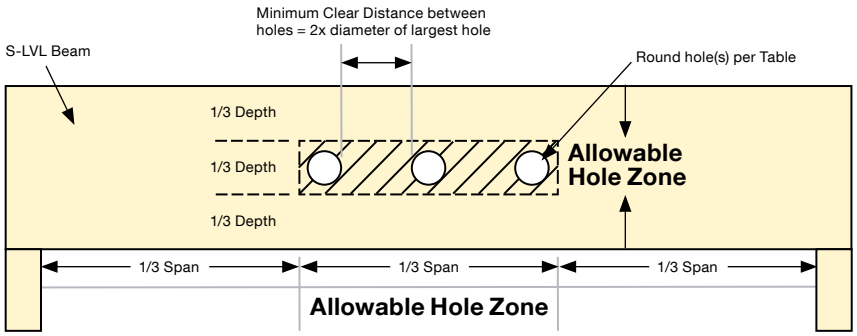
Equivalent Specific Gravity

Product	Fasteners	Fastener Axis Orientation	Load Direction	Equivalent GS for Design Purposes	Max Spacing
Stora Enso LVL-S	Nails	Y axis	Withdrawal	0.4	See footnote 4
		X axis	Withdrawal	0.34	
	Nails & Screws	Y axis	L and X	0.5	
		X axis	L and Y	0.35	
	Bolts	Y axis	L	0.41	Per applicable code
			X	0.45	

1. Orientation nomenclature for S-LVL™ LVL
2. Adjustment of the fastener values for duration of load shall be in accordance with the applicable code,NDS, as applicable.
3. Lateral resistance and withdrawal values are as provided in NDS for sawn lumber having equivalent specific gravities as shown.
4. Spacing, edge distance and end distance of nails installed perpendicular to the glue lines of the LVL™ are the same as those permitted in the applicable code for sawn lumber. Spacing of nails installed parallel to the glue lines of the LVL™ must be a minimum of 3" (76 mm) for 8d (0.131" x 2½") (3.3 mm x 63 mm) common nails, 4" (102 mm) for 10d (0.148" x 3") (3.8 mm x 76 mm) and 12d (0.148" x 3¼") (3.8 mm x 83 mm) common nails. The end distances must be a minimum of 2" (51 mm) for 8d (0.131" x 2½") (3.3 mm x 63 mm) common nails, 3" (76 mm) for 10d (0.148" x 3") (3.8 mm x 76 mm) and 12d (0.148" x 3¼") (3.8 mm x 83 mm) common nails. The minimum nail spacing must be 8" (204 mm) for 16d (0.162" x 3½") (4.1 mm x 89 mm) common nails installed parallel to the glue lines of the LVL™ that is at least 1¾" thick by 5½" wide (44mm by 133 mm), and the minimum end distance must be 3" (76 mm). Minimum edge distance must be sufficient to prevent splitting of the LVL™. In addition, maximum nail penetration into the LVL™ must be limited as to prevent splitting.

Circular holes

Guidance on the design of beams with circular holes.



Allowable Hole Sizes

Beam Depth	Max Round Hole Diameter
7¼" - 9¼"	1½"
9½" - 16"	2"
Deeper than 16"	3"

Notes:

1. Holes(s) must be located completely in the allowable hole zone.
2. No rectangular holes are allowed.
3. No more than three (3) holes allowed per span.
4. Table is valid for simple span, uniformly loaded beams only. Table is not valid for cantilever sections.
5. Hole location, clearance and effect of beam deflection should be considered to avoid problems with piping.
6. Connections by others.
7. Notching of beam not permitted.

6. Storage and handling

LVL products must be handled and stored properly and carefully. Incorrect handling and storing may cause defects on product's surfaces, edges or corners. Furthermore, the dimensional stability of the product may suffer.

Transportation

While transporting or storing the product, increased moisture caused by rain or splashing must be avoided. If LVL products are moved with a forklift, wide enough forks must be used in order to avoid damaging the product. When lifting several packs at a time, the distance between forks must be wide enough to ensure safe lifting.

Unloading

LVL packages are to be handled with forklift or crane by using web slings. Web slings used must be of proper condition and strength.

Use of chains or wires is forbidden. Incorrect handling may damage surface or edges, also dimensional stability of the product may suffer. Do not drop packages from trucks or push with the fork tips. When handled with forklift proper stability has to be considered. Distance of the forks must be wide enough for safe lifting.

Storing

Packages have to be stored weather protected under cover. Place the packages on wooden skids at least 1 ft. off the ground on a flat and dry surface. The skids must be of suitable size, amount and have to be spread evenly to prevent products from twisting and crooking.

In storing packages over a week, cut plastic open from bottom corner to enable air circulation.

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