

5/16 IN. Multi-Ply Structural Screws

STRUCTURAL MULTI-PLY ASSEMBLIES



CAMO 5/16" Structural Multi-Ply and Ledger + Multi-Ply Screws have been evaluated for their ability to provide multi-ply attachment in trusses, sawn lumber and engineered wood products / structural composite lumber (SCL) applications. When installed following the instructions in this bulletin, the use of our 5/16" structural screws is governed by the applicable code and the provisions for dowel type fasteners in the National Design Specification (NDS) for Wood Construction to replace nails or bolts.

CORROSION STATEMENT

Our proprietary PROTECH Ultra 4 four-layer coating system applied to our Multi-Ply Screws has been tested in accordance with ASTM G198 and offers the same level of protection as code-approved hot-dip galvanized (ASTM A153, Class D) in ground contact general use pressure treated lumber (AWPA UC1-UC4A). Our Multi-Ply screws with PROTECH Ultra 4 coating are recognized for use in untreated lumber, ground contact general use pressure-treated lumber, and fire retardant treated (FRT) lumber. A statement of compliance can be found in our DrJ TER reports.



PRODUCT FEATURES

- Code listed per DrJ TER No. 2102-01 and 2102-04 and State of Florida FL 41741
- Flat head with T-40 star drive
- No pre-drilling necessary
- PROTECH Ultra 4 coating offers same level of protection as hot-dip galvanized coating
- Head markings provide easy identification after installation



SAWN LUMBER MULTI-PLY ASSEMBLIES

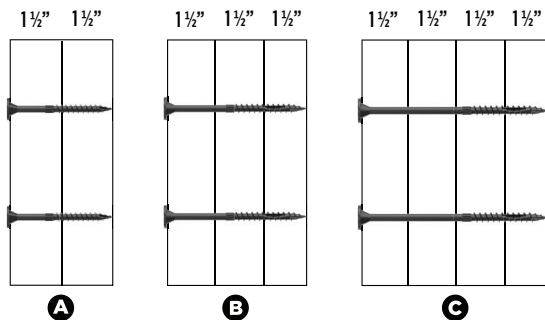
INSTALLATION INSTRUCTIONS - SAWN LUMBER

- 1) Choose the proper fastener length for your Sawn Lumber application (Table 1)
- 2) Use a ½" (12.7mm) low rpm/high torque electric drill (450 rpm) and the driver bit supplied with the screws.
- 3) Install fasteners in rows (staggered or in-line) per Table 1. Follow the minimum spacing, edge distance, and end distance requirements in Table 3.
- 4) Drive the screws until the underside of the head is flush to the surface of the wood. Do not overdrive.

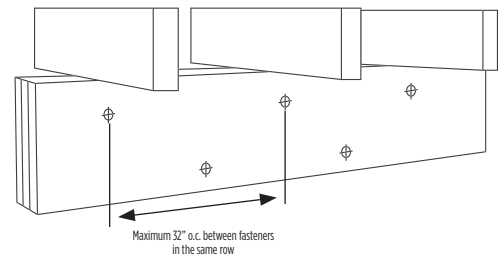
TABLE 1: Allowable Lateral Design Values (plf) for Multi-Ply Truss and Sawn Lumber Assemblies ^{2,3,4,5,6}

FASTENER	ASSEMBLY	MEMBERS	FASTENER LENGTH ¹	SPF/HF (0.42)						DF/SP (0.50)					
				12" o.c.		16" o.c.		24" o.c.		12" o.c.		16" o.c.		24" o.c.	
				Number of Fasteners Per Row											
				2	3	2	3	2	3	2	3	2	3	2	3
5/16" X 2 7/8"	A	2-PLY 1 1/2"	2 7/8"	1320	1980	990	1485	660	990	1680	2520	1265	1900	840	1260
5/16" X 4"	B	3-PLY 1 1/2"	4"	990	1485	745	1120	495	745	1260	1890	945	1420	630	945
5/16" X 4 1/2"		3-PLY 1 1/2"	4 1/2"	990	1485	745	1120	495	745	1260	1890	945	1420	630	945
5/16" X 6"	C	4-PLY 1 1/2"	6	1575	2365	1185	1780	790	1185	2040	3060	1535	2305	1020	1530

TOP LOADED BEAMS



Space screws in 2 rows
maximum 32" o.c.
between fasteners in a
staggered pattern.



SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m

1. Fastener length is measured from the topside of the head to the tip.
2. Wood framing shall be any species with specific gravity, SG, of 0.42 or greater. For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for specific gravity of 0.42. For wood species with an assigned specific gravity greater than 0.50, use the tabulated values for specific gravity of 0.50.
3. Allowable design values are based on a load duration factor CD = 1.0 and shall be multiplied by all applicable adjustment factors per the NDS.
4. The tabulated allowable design loads may be applied to either side of the beam (head or point side of the fastener). Where loads are applied to both sides of the beam simultaneously, the total load applied to the beam shall not exceed the tabulated load.
5. For top-loaded members with even loading across the width of the entire assembly, fasteners shall be installed in two (2) rows with a maximum distance of 32" o.c. (on-center) between fasteners in the same row.
6. Tabulated loads are for the connection strength. Beams and framing members shall be independently checked by a registered design professional.

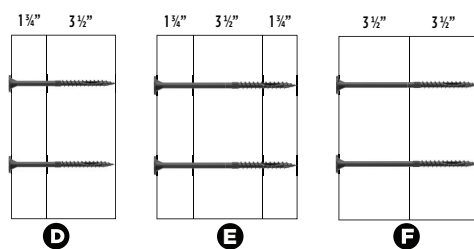
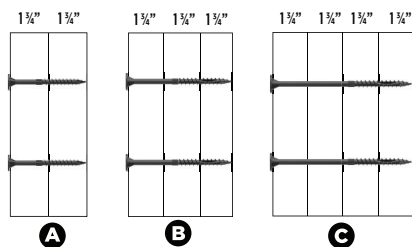
STRUCTURAL COMPOSITE LUMBER MULTI-PLY ASSEMBLIES

INSTALLATION INSTRUCTIONS - STRUCTURAL COMPOSITE LUMBER

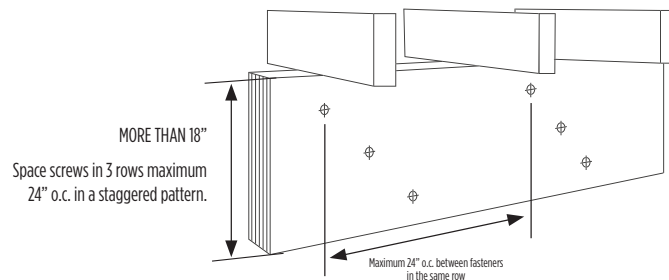
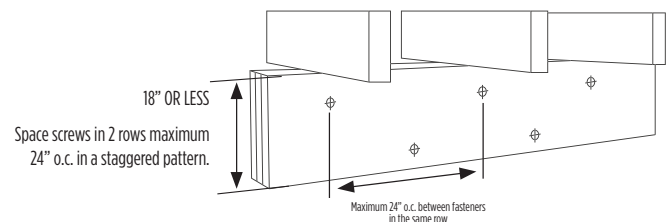
- 1) Choose the proper fastener length for your Structural Composite Lumber application (Table 2)
- 2) Use a ½" (12.7mm) low rpm/high torque electric drill (450 rpm) and the driver bit supplied with the screws.
- 3) Install fasteners in either 2 or 3 rows (staggered or in-line) per Table 2. Follow the minimum spacing requirements in Table 3.
- 4) Drive the screws until the underside of the head is flush to the surface of the wood. Do not overdrive.

TABLE 2: Allowable Lateral Design Values (plf) for Multi-Ply Truss and SCL Assemblies^{2,3, 4,5,6}

FASTENER	ASSEMBLY	MEMBERS	FASTENER LENGTH ¹	12" o.c.		16" o.c.		24" o.c.	
				Number of Fasteners Per Row					
				2	3	2	3	2	3
5/16" X 3 1/2"	A	2-PLY 1 3/4"	3 1/2"	1680	2520	1265	1900	840	1260
5/16" X 5"	B	3-PLY 1 3/4"	5"	2295	3445	1725	2590	1150	1725
5/16" X 6 3/4"	C	4-PLY 1 3/4"	6 3/4"	2040	3060	1535	2305	1020	1530
5/16" X 5"	D	2-PLY 1 3/4" & 3 1/2"	5"	2295	3445	1725	2590	1150	1725
5/16" X 6 3/4"	E	3-PLY 1 3/4" & 3 1/2"	6 3/4"	2040	3060	1535	2305	1020	1530
5/16" X 6 3/4"	F	2-PLY 3 1/2"	6 3/4"	3060	4590	2300	3450	1530	2295



TOP LOADED BEAMS



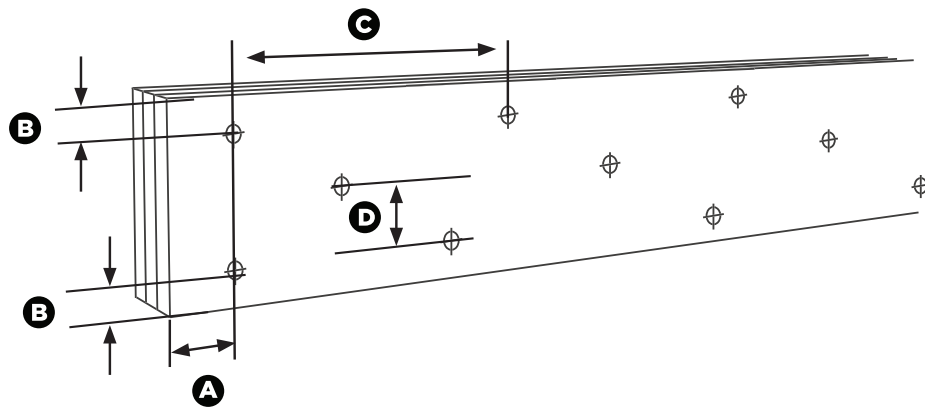
SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m

1. Fastener length is measured from the underside of the head to the tip.
2. SCL shall have a specific gravity, SG, of 0.50 or greater. Thicknesses listed in Figure 3 are a minimum.
3. Allowable design values are based on a load duration factor of CD = 1.0 and shall be multiplied by all applicable adjustment factors per the NDS.
4. The tabulated allowable design loads may be applied to either side of the beam (head or point side of the fastener). Where loads are applied to both sides of the beam simultaneously, the total load applied to the beam shall not exceed the tabulated load.
5. For top-loaded members with even loading across the width of the entire assembly, and a depth of 18" or less, fasteners shall be installed in two (2) rows with a maximum distance of 24" o.c. between fasteners in the same row. Use three (3) rows for members deeper than 18".
6. Tabulated loads are for the connection strength. Beams and framing members shall be independently checked by a registered design professional.

MINIMUM SPACING REQUIREMENTS

TABLE 3: Screw Spacing, Edge Distance, and End Distance Requirements^{1,2}

CONNECTION GEOMETRY		MINIMUM SPACING (IN)
End Distance — Load parallel to grain, towards end	A	3 3/8"
End Distance — Load parallel to grain, away from end		2 1/4"
End Distance — Load perpendicular to grain		2 1/4"
Edge Distance — Load in any direction	B	5/8"
Spacing between Fasteners in a Row — Parallel to grain	C	3 3/8"
Spacing between Fasteners in a Row — Perpendicular to grain		2 1/4"
Spacing between Rows of Fasteners — In-line	D	1 1/8"
Spacing between Rows of Fasteners — Staggered ²		5/8"



SI: 1 in = 25.4 mm

- Edge distances, end distances, and spacing of fasteners shall be sufficient to prevent splitting of the wood or as shown in this table, whichever is more restrictive.
- Values for "Spacing between Rows or Fasteners-Staggered" apply where the screws in adjacent rows are offset by one-half of the "Spacing between Fasteners in a Row".

TABLE 4: CAMO® 5/16" Structural Series Screws Properties¹

FASTENER DESIGNATION	HEAD				LENGTH (IN)		DIAMETER (IN)			BENDING YIELD STRENGTH ⁴ fyb (psi)	Allowable Steel Strengths (lbs)	
	STYLE	DRIVE SYSTEM	DIAMETER	HEIGHT	FASTENER ²	THREAD ³	SHANK	MINOR	MAJOR		TENSILE	SHEAR ⁵
5/16" X 2 7/8"	Flat Head	T40 Star Drive	.738	.079	2.875	1.437	.220	.197	.307	175,000	1,580	1,150
5/16" X 3 1/2"					3.500	2.000						
5/16" X 4"					4.000	2.370						
5/16" X 4 1/2"					4.500	2.370						
5/16" X 5"					5.000	2.752						
5/16" X 6"					6.000	2.752						
5/16" X 6 3/4"					6.750	2.752						

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 psi = 0.00689 MPa

- Tabulated fastener dimensions are measured on uncoated fasteners. Finished dimensions are different due to the proprietary coating added.
- Nominal fastener length is measured from the underside of the head to the tip.
- Thread length includes tapered tip.
- Bending yield strength, Fyb, is determined in accordance with ASTM F1575 using minor thread diameter when fastener is tested in threaded section.
- Shear strength is determined in accordance with AISI S904 using minor thread diameter when fastener is tested in threaded section.