

ICC-ES Evaluation Report

ESR-1352

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**DIVISION: 06 00 00—WOOD, PLASTICS, AND
COMPOSITES**
Section: 06 17 53—Shop-Fabricated Wood Trusses

REPORT HOLDER:

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EVALUATION SUBJECT:

**MiTek® TRUSS CONNECTOR PLATES: TEE-LOK16™
AND MT16™**

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)
- 1997 *Uniform Building Code*™ (UBC)

Property evaluated:

Structural

2.0 USES

Tee-Lok16™ and MT16™ are metal truss connector plates used in the construction of metal plate connected wood roof and floor trusses.

3.0 DESCRIPTION

The Tee-Lok 16™ and MT16™ plates are manufactured from minimum No. 16 gage [0.0575 inch total thickness (1.46 mm)], ASTM A 653 SS, Grade 40 steel, with a G60 galvanization coating [0.0005 inch thickness on each side (0.013 mm)] and having a base-metal thickness of 0.0565 inch (1.44 mm). The Tee-Lok 16™ and MT16™ plates have slots approximately 0.5 inch (12.7 mm) long by 0.145 inch (3.7 mm) wide that have been punched along the longitudinal axis of the plate. The metal, displaced by the slot, forms two opposite-facing pointed teeth at right angles from the flat plate. The punched slots are spaced approximately 0.515 inch (13.1 mm) apart across the width of the plate and are spaced approximately 0.75 inch (19.1 mm) apart along the length of the plate, with adjacent longitudinal rows staggered halfway between. The connector plates are available in 1-inch (25.4 mm) increments of width and 1.25-inch (31.8 mm) increments of length. Minimum plate width and length are 3 inches (76.2 mm) and 3.8 inches (96.5 mm), respectively. There are 4.8

teeth per square inch (0.744 teeth per square centimeter) of plate surface. The length of each tooth, including the thickness of the parent metal, is approximately 0.433 inch (11 mm), and the width of each tooth is approximately 0.145 inch (3.7 mm). Adjacent longitudinal rows of teeth are twisted in the same direction. See Figure 1 for details.

4.0 DESIGN AND INSTALLATION

4.1 General:

All truss plates are pressed into the wood to the full depth of their teeth by hydraulic-platen embedment presses, multiple-roller presses that use partial embedment followed by full-embedment rollers, or combinations of partial embedment roller presses and hydraulic-platen presses that feed trusses into a stationary-finish roller press. Trusses must be assembled within the tolerances provided by the Truss Plate Institute's Quality Criteria for Metal Plate Connected Wood Trusses, shown as Section 4 in ANSI/TPI 1 National Design Standard for Metal Plate Connected Wood Truss Construction.

4.2 Allowable Design Values:

Allowable design values for MiTek® Industries metal truss connector plates, to be used in the design of metal plate connected wood roof and floor trusses, are shown in Tables 1 and 2 of this report. These allowable design values are applicable for metal plate connected wood roof and floor trusses when connections are made with identical plates on opposite sides of the joint. The design, manufacture and installation of trusses employing the truss plates are beyond the scope of this report.

5.0 CONDITIONS OF USE

The MiTek® Industries truss plates described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 This evaluation report and the manufacturer's published installation instructions, when required by the code official, must be submitted at the time of permit application. In the event of a conflict between the manufacturer's published installation instructions and this document, the instructions in this document govern.

5.2 Each application for a building permit using these truss plate connectors must be accompanied by documentation showing that the design, manufacture, and proposed installation conforms with the requirements of the applicable code.

- 5.3 This report establishes plate design values only. For items not covered by this report, such as truss design, fabrication, quality assurance and inspection, refer to ANSI/TPI 1 engineering drawings and the applicable code.
- 5.4 The design values (lateral resistance values, effective tension strength ratios, and effective shear resistance ratios) used in the design of trusses, using MiTek® Industries metal truss connector plates, must not exceed those listed in Tables 1 and 2 of this report. Load combination reductions must be in accordance with the applicable code.
- 5.5 All lumber used in the fabrication of trusses using MiTek® Industries metal truss connector plates must be graded in compliance with the applicable building code, and must have a moisture content not exceeding 19 percent at the time of assembly. Wet service factors from ANSI/TPI 1 Section 6.4.5 must be applied to the table values when the lumber moisture content exceeds 19 percent. Allowable values shown in the tables of this report are not applicable to metal connector plates embedded in either fire-retardant-treated lumber or preservative-treated lumber.
- 5.6 Metal truss connector plates must be installed in pairs, on opposite faces of truss members.

- 5.7 Galvanized G60 metal truss plate connectors subject to corrosive environments must be protected in accordance with Section 6.5 of ANSI/TPI 1.
- 5.8 These products are manufactured by MiTek Industries in Saint Charles, Missouri; Phoenix, Arizona; Tampa, Florida; Edenton, North Carolina; and Bradford, Ontario, Canada.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the National Design Standard for Metal Plate Connected Wood Truss Construction, ANSI/TPI 1-2002.
- 6.2 Manufacturer’s descriptive literature.
- 6.3 A quality control manual.

7.0 IDENTIFICATION

Each Tee-Lok 16™ or MT16™ metal connector plate bears the identifying mark “T-L-S” or “MT16” stamped into the parent metal. Additionally, boxes containing the connector plates must be labeled with the MiTek® Industries, Inc., name, the metal connector plate model and the evaluation report number (ESR-1352).

TABLE 1—ALLOWABLE LATERAL RESISTANCE VALUES, HYDRAULIC-PLATEN EMBEDMENT^{1,2,3,4} (lb/in²/PLATE)

LUMBER SPECIES	SG	AA	EA	AE	EE
Tee-Lok 16™ and MT16™					
Douglas fir–larch	0.49	152	158	117	135
Hem–fir	0.43	112	113	103	104
Spruce–pine–fir	0.42	116	127	96	105
Southern pine	0.55	171	147	135	138

For **SI**: 1lb/in² = 6.9 kPa.

¹Tooth holding units = psi for a single plate (double for plates on both faces when applying to area on only one face). To achieve values, plates must be installed on opposite sides of joint.

²AA = Plate parallel to load, wood grain parallel to load.

EA = Plate perpendicular to load, wood grain parallel to load.

AE = Plate parallel to load, wood grain perpendicular to load.

EE = Plate perpendicular to load, wood grain perpendicular to load.

³All truss plates are pressed into the wood for the full depth of their teeth by hydraulic-platen embedment presses, multiple-roller presses that use partial embedment followed by full-embedment rollers, or combinations of partial embedment roller presses and hydraulic-platen presses that feed trusses into a stationary finish roller press.

TABLE 2—EFFECTIVE TENSION AND SHEAR RESISTANCE ALLOWABLE DESIGN VALUES¹

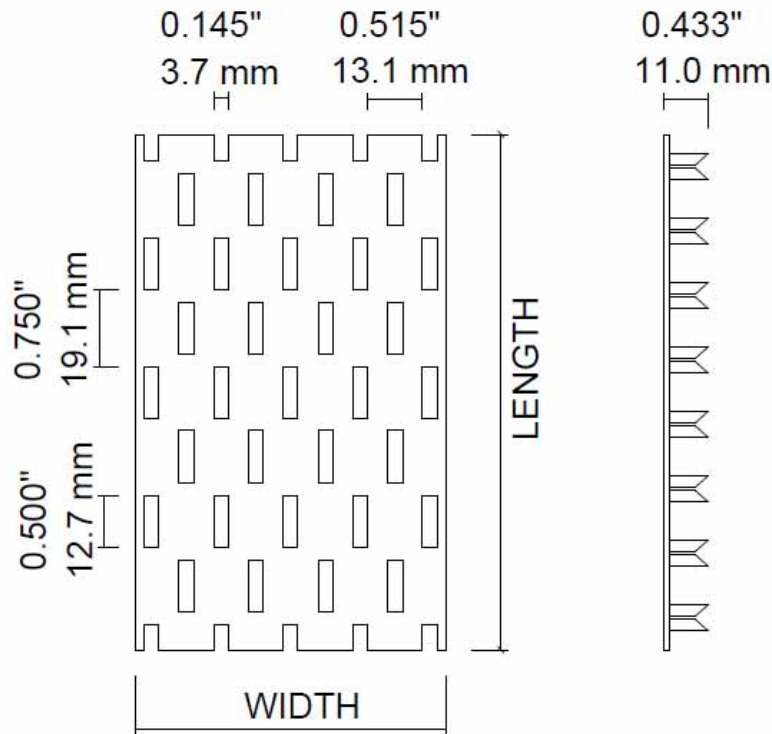
PROPERTY FORCE DIRECTION	TEE-LOK 16™ AND MT16™	
	Efficiency	Pounds/inch/Pair of Connector Plates
Tension values in accordance with Section 5.4.4.2 of TPI-1 (Minimum Net Section over the joint) ²		
Tension @ 0°	0.68	1929
Tension @ 90°	0.39	1106
Tension values in accordance with TPI-1 with a deviation (see Section 5.4.9 (e) 1) (Maximum Net Section occurs over the joint) ³		
Tension @ 0°	0.65	1868
Tension @ 90°	0.33	942
Shear Values		
Shear @ 0°	0.70	1,299
Shear @ 30°	0.67	1,244
Shear @ 60°	0.82	1,522
Shear @ 90°	0.68	1,262
Shear @ 120°	0.66	1,225
Shear @ 150°	0.56	1,039

For **SI**: 1 lb/inch = 0.175 N/mm, 1 inch = 25.4 mm.

¹Minimum coated thickness is 0.0575 inch (1.461 mm) for 16 gage in accordance with Section 4.3.4 of ANSI/TPI 1. Minimum coating thickness for G60 is 0.0010 inch (0.025 mm) total for both sides in accordance with Section 4.3.6 of ANSI/TPI 1.

²Minimum Net Section – A line through the plate's tooth pattern with the minimum amount of steel for a specified orientation. For these plates, this line passes through a line of holes.

³Maximum Net Section – A line through the plate's tooth pattern with the maximum amount of steel for a specified orientation. For these plates, this line passes through a section of the plate with no holes.



MiTek MT16

FIGURE 1—APPROXIMATE DIMENSIONS OF TEE-LOK 16™ AND MT 16™ CONNECTOR PLATES