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ICC-ES Evaluation Report

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ESR-1352

Reissued 06/2019

This report is subject to renewal 06/2021.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
SECTION: 06 17 53—SHOP-FABRICATED WOOD TRUSSES

REPORT HOLDER:

MITEK USA, INC.

**16023 SWINGLEY RIDGE ROAD
CHESTERFIELD, MISSOURI 63017**

EVALUATION SUBJECT:

MITEK® TRUSS CONNECTOR PLATES: TEE-LOK16™ AND MT16™



*"2014 Recipient of Prestigious Western States Seismic Policy Council
(WSSPC) Award in Excellence"*



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

REPORT HOLDER:

MITEK USA, INC.
16023 SWINGLEY RIDGE ROAD
CHESTERFIELD, MISSOURI 63017
(314) 434-1200
www.mitek-us.com

EVALUATION SUBJECT:

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

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015, 2012, 2009 and 2006 *International Building Code®* (IBC)
- 2018, 2015, 2012, 2009 and 2006 *International Residential Code®* (IRC)

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-Lok16™ and MT16™ plates are manufactured from minimum No. 16 gage [0.0575 inch total thickness (1.46 mm)], ASTM A653 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-Lok16™ 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 specified in ANSI/TPI 1, Chapter 3, Quality Criteria for the Manufacture of Metal-Plate-Connected Wood Trusses.

4.2 Allowable Design Values:

Allowable design values for MiTek® 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. Allowable design values are applicable when the connection is made with identical plates on opposite sides of the joint. This evaluation report is limited to the evaluation of connection capacity of the MiTek® metal truss connector plates listed in this report. The design, manufacture and installation of trusses employing the truss plates have not been evaluated.

Allowable values shown in Table 1 have not been adjusted for metal connector plates embedded in fire-retardant-treated or preservative-treated lumber. Proper adjustments must be made in accordance with the requirements indicated in a current ICC-ES evaluation report issued to the chemical treatment manufacturer. If the evaluation report does not contain information on the adjustments, the chemical manufacturer must be contacted for this information. Compliance with Section 2304.10.5 of the 2018 and 2015 IBC (Section 2304.9.5 of the 2012, 2009 and 2006 IBC) and Section R317.3 of the 2018, 2015, 2012 and 2009 IRC (Section R319.3 of the 2006 IRC) is also required.

5.0 CONDITIONS OF USE

The MiTek® metal truss connector 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 metal truss connector plates 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 the applicable version of ANSI/TPI 1, engineering drawings and the applicable code.
- 5.4** The design values (allowable lateral resistance values and effective tension and shear resistance allowable design values) used in the design of trusses, using MiTek® 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® 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 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 connector plates subject to corrosive environments must be protected in accordance with Section 6.5 of ANSI/TPI 1.
- 5.8** MiTek® metal truss connector plates are manufactured in Hazelwood, Missouri; Tampa, Florida; Edenton, North Carolina; and Bradford, Ontario, Canada, under a quality-control program with inspections by ICC-ES.

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, 2007 and 2014.
- 6.2** Manufacturer's descriptive literature.
- 6.3** A quality control manual.

7.0 IDENTIFICATION

Each Tee-Lok16™ 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® 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} (lb/in²/PLATE)

LUMBER SPECIES	SPECIFIC GRAVITY	ORIENTATION			
		AA	EA	AE	EE
Tee-Lok16™ 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 VALUES

PROPERTY AND FORCE DIRECTION ²	TEE-LOK16™ AND MT16™	
	Effective Ratio	Pounds per Linear Inch Per Pair of Connector Plates
Tension values in accordance with Section 5.4.4.2 of TPI-1 (Minimum Net Section over the joint) ¹		
Tension @ 0°	0.68	1,929
Tension @ 90°	0.39	1,106
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 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.

²Direction of load is with respect to the length of the plate.

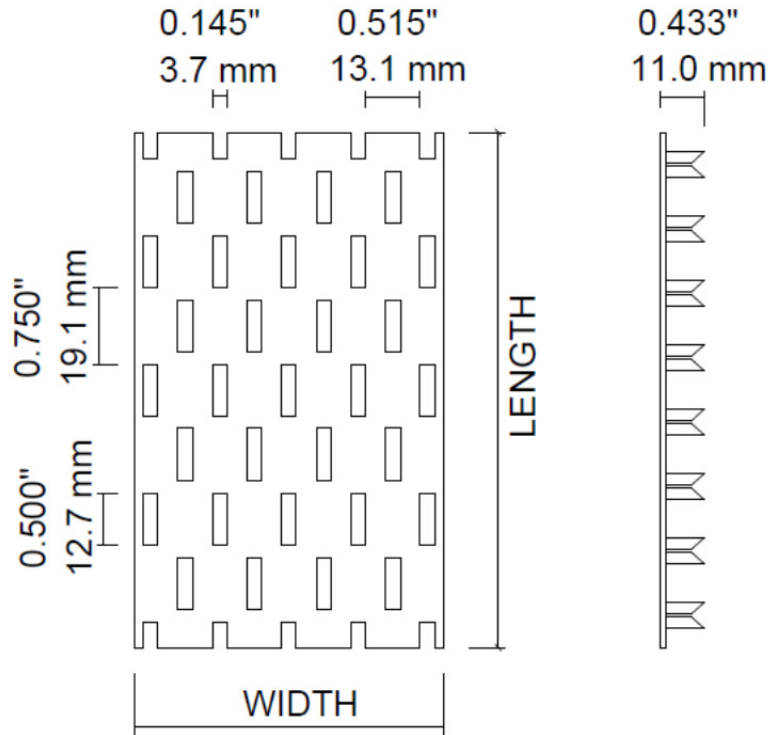


FIGURE 1—APPROXIMATE DIMENSIONS OF TEE-LOK16™ AND MT 16™ CONNECTOR PLATES

ICC-ES Evaluation Report

ESR-1352 CBC and CRC Supplement

Reissued June 2019

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EVALUATION SUBJECT:

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

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the MiTek® Truss connector plates Tee-Lok16™ and MT16™, recognized in ICC-ES master report ESR-1352, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2016 *California Building Code* (CBC)
- 2016 *California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The MiTek® Truss connector plates Tee-Lok16™ and MT16™, described in Sections 2.0 through 7.0 of the master evaluation report ESR-1352, comply with CBC Chapter 23, provided the design and installation are in accordance with the 2015 *International Building Code*® (2015 IBC) provisions noted in the master report, and the additional requirements of CBC Chapters 16, 16A, 17, 17A and 23, as applicable.

2.2 CRC:

The MiTek® Truss connector plates Tee-Lok16™ and MT16™, described in Sections 2.0 through 7.0 of the master evaluation report ESR-1352, comply with CRC Sections R502.11 and R802.10, provided the design and installation are in accordance with the 2015 *International Residential Code*® (2015 IRC) provisions noted in the master report.

This supplement expires concurrently with the master report, reissued June 2019.

ICC-ES Evaluation Report

ESR-1352 FBC Supplement

Reissued June 2019

This report is subject to renewal June 2021.

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Applicable code editions:

- 2017 *Florida Building Code—Building*
- 2017 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The MiTek® Truss Connector Plates Tee-Lok16™ and MT16™, described in Sections 2.0 through 7.0 of the master evaluation report ESR-1352, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the design and installation are in accordance with the 2015 *International Building Code*® (IBC) provisions noted in the master report.

Use of the MiTek® Truss Connector Plates Tee-Lok16™ and MT16™ has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*.

For products falling under Florida Rule 9N-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the master report, reissued June 2019.