

# ICC-ES Evaluation Report

## ESR-2529

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**DIVISION: 06—WOOD AND PLASTICS**  
**Section: 06175—Truss Plates**

**REPORT HOLDER:**

**COMPUTRUS, INC.**  
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LAKE ELSINORE, CALIFORNIA 92530  
(951) 245-9525

**EVALUATION SUBJECT:**

**COMPUTRUS C SERIES AND CN SERIES CONNECTOR  
PLATES FOR WOOD TRUSSES**

**1.0 EVALUATION SCOPE**

**Compliance with the following codes:**

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)
- Legacy Codes (see Section 8.0)

**Property evaluated:**

Structural

**2.0 USES**

The CompuTrus C Series and CN Series connector plates are metal truss plates used as joint connector components of wood frame trusses.

**3.0 DESCRIPTION**

**3.1 C Series:**

The CompuTrus truss plates are manufactured from No. 18 gage [0.0454 inch (1.15 mm) base-metal thickness] and No. 20 gage [0.0375 inch (0.95 mm) base metal thickness], ASTM A 653 SS Grade 33 or higher steel, with a G60 galvanization coating [0.0005 inch thick (0.013 mm) on each side]. The plates are manufactured in various lengths and widths, and have integral teeth that are designed to laterally transmit load between truss wood members.

Each plate has 9.4 teeth per square inch, and each tooth is approximately  $\frac{1}{3}$  inch (8.5 mm) long and approximately 0.106 inch (2.7 mm) wide. The teeth are punched in pairs, with each pair spaced  $\frac{1}{4}$  inch (6.4 mm) on center along the width of the plate, and 0.85 inch (21.6 mm) on center along the length. Alternating rows of teeth are staggered 0.10 inch (2.5 mm) from adjacent rows. Plates are 0.85 inch (21.6 mm) in length, and are available in widths of up to

12 inches (305 mm), in  $\frac{1}{2}$ -inch (12.7 mm) increments, as required by design. See Figure 1 for details of plate dimensions.

**3.2 CN Series:**

The CN series plates are similar to the C series plates, except that every third row of teeth is omitted.

**4.0 DESIGN AND INSTALLATION**

**4.1 General:**

All truss plates are pressed into the wood for the full depth of their teeth by hydraulic-platen or pneumatic 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 or, if the lateral load adjustment factors given in Table 4 are used, single-pass roller presses.

When truss fabricators use single-pass roller presses, the rollers must have minimum 18-inch (457 mm) diameters. Plates embedded with a single-pass, full-embedment roller press must be preset, before passing through the roller press, by striking at least two opposite corners of each plate with a hammer.

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 the CompuTrus truss plates to be used in the design of metal plate connected wood trusses are shown in Tables 1, 2 and 3. These values are based on ANSI/TPI 1. A copy of the ANSI/TPI 1 standard must be supplied to the building department when this is requested by the building official.

The allowable design values are applicable for metal plate connected wood trusses when connections are made with identical plates on opposite sides of the joint. The design, manufacture, and installation of the wood trusses employing the truss plates must comply with Section 2304.4 of the IBC.

**5.0 CONDITIONS OF USE**

The CompuTrus Truss Plates for Wood Trusses 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 report, the instructions in this report govern.
  - 5.2 Each application for a building permit, where these metal truss connector plates are to be used, 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 special inspection, refer to ANSI/TPI 1, engineering drawings and the applicable code.
  - 5.4 The design values (lateral resistance values, tension values, tension efficiency ratios, shear values and shear efficiency ratios) used in the design of trusses, using CompuTrus, Inc., metal truss connector plates, must not exceed those listed in Tables 1, 2 and 3 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 CompuTrus, Inc., 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 When a one-hour fire-resistive rating is required for trusses using CompuTrus plates, see evaluation report [ESR-1338](#).
  - 5.9 CompuTrus, Inc., metal truss connector plates are manufactured in Lake Elsinore, California.
- ## 6.0 EVIDENCE SUBMITTED
- 6.1 Data in accordance with National Design Standard for Metal Plate Connected Wood Truss Construction, ANSI/TPI 1-2002.
  - 6.2 Quality documentation.
- ## 7.0 IDENTIFICATION
- The CompuTrus C series plates are embossed, respectively, with the designation C-20 or C-18, for the No. 20 gage or No. 18 gage plates. For the CN series, the No. 20 gage plate is identified by the designation CN-20 embossed on the plate, while the No. 18 gage plate is identified by the designation CN-18 embossed on the plate. Additionally, boxes containing the connector plates are labeled with the report holder's name (CompuTrus, Inc.), the product name (C-18, C-20, CN-18 or CN-20), and the evaluation report number (ESR-2529).
- ## 8.0 LEGACY CODES
- The products described in Sections 2.0 through 7.0 of this report comply with the 1997 *Uniform Building Code*<sup>™</sup> (UBC), except that the National Design Standard for Metal Plate Connected Wood Truss Construction, ANSI/TPI 1-1995, must be used.

**TABLE 1—ALLOWABLE LATERAL RESISTANCE VALUES FOR THE COMPUTRUS TRUSS PLATES<sup>1,2</sup>**

PLATE MODEL	LUMBER		DIRECTION OF GRAIN AND LOAD WITH RESPECT TO LENGTH OF PLATE			
	Species	Specific Gravity	AA	EA	AE	EE
			Allowable Load per Plate <sup>3</sup> (pounds per square inch of plate contact area)			
C-20 and C-18	Southern yellow pine	0.55	206	151	113	108
	Douglas fir–larch	0.49	206	151	113	108
	Hem-fir	0.43	161	137	110	104
	Spruce-pine-fir	0.42	161	137	110	104
CN-20 and CN-18	Southern yellow pine	0.55	132	118	102	113
	Douglas fir–larch	0.49	132	118	102	113
	Hem-fir	0.43	106	109	114	114
	Spruce-pine-fir	0.42	106	109	114	114

For **SI**: 1 lb./inch<sup>2</sup> = 6.89 kPa.

<sup>1</sup>AA = 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.

<sup>2</sup>Values are determined using the gross area method.

<sup>3</sup>Truss plates are installed in pairs on opposite faces of truss members.

**TABLE 2—ALLOWABLE TENSION VALUES AND TENSION EFFICIENCY RATIOS FOR COMPUTRUS TRUSS PLATES**

PLATE MODEL	DIRECTION OF LOAD WITH RESPECT TO LENGTH OF PLATE <sup>1</sup>			
	0°	90°	0°	90°
	Allowable Tension Load (pounds per lineal inch per pair of plates)		Tension Load Efficiency Ratio	
C-20	1,310	942	0.63	0.46
CN-20	1,514	937	0.75	0.46
C-18	1,619	1,080	0.62	0.42
CN-18	1,859	1,220	0.73	0.48

For **SI**: 1 lbf/inch = 0.175 N/mm.

<sup>1</sup>The length of plate refers to the dimension of the longitudinal axis of the area of the plate from which the plate teeth were sheared during plate fabrication.

**TABLE 3—ALLOWABLE SHEAR VALUES AND SHEAR EFFICIENCY RATIOS FOR COMPUTRUS TRUSS PLATES**

PLATE MODEL	DIRECTION OF LOAD WITH RESPECT TO LENGTH OF PLATE											
	0°	30°	60°	90°	120°	150°	0°	30°	60°	90°	120°	150°
	Allowable Shear Load (pounds per lineal inch per pair of plates)						Shear Load Efficiency Ratio					
C-20	609	720	1,106	801	423	506	0.49	0.59	0.91	0.66	0.35	0.42
CN-20	610	696	1,045	738	587	486	0.50	0.57	0.86	0.61	0.48	0.40
C-18	702	732	1,241	1,041	565	578	0.45	0.46	0.79	0.66	0.36	0.37
CN-18	647	787	809	860	703	508	0.42	0.51	0.52	0.55	0.45	0.33

For **SI**: 1 lbf/inch = 0.175 N/mm.

**TABLE 4—ALLOWABLE LATERAL LOAD ADJUSTMENT FACTOR,  $Q_R$ , FOR COMPUTRUS TRUSS PLATES INSTALLED WITH MINIMUM 18-INCH-DIAMETER SINGLE-PASS ROLLER PRESSES**

PLATE MODEL	LUMBER SPECIES SPECIFIC GRAVITY <sup>1</sup>	$Q_R$
C-20 and C-18	0.49	0.96
	0.50	0.96
CN-20 and CN-18	0.49	0.87
	0.50	0.87

<sup>1</sup>The  $Q_R$  values corresponding to the value “0.49,” above, apply to all wood species combinations having an average published specific gravity of 0.49 or lower; the  $Q_R$  values corresponding to the value “0.50” apply to all wood species combinations having an average published specific gravity of 0.50 or higher. The  $Q_R$  values shall be applied to all plate/wood orientations described in Footnote 1 to Table 1.

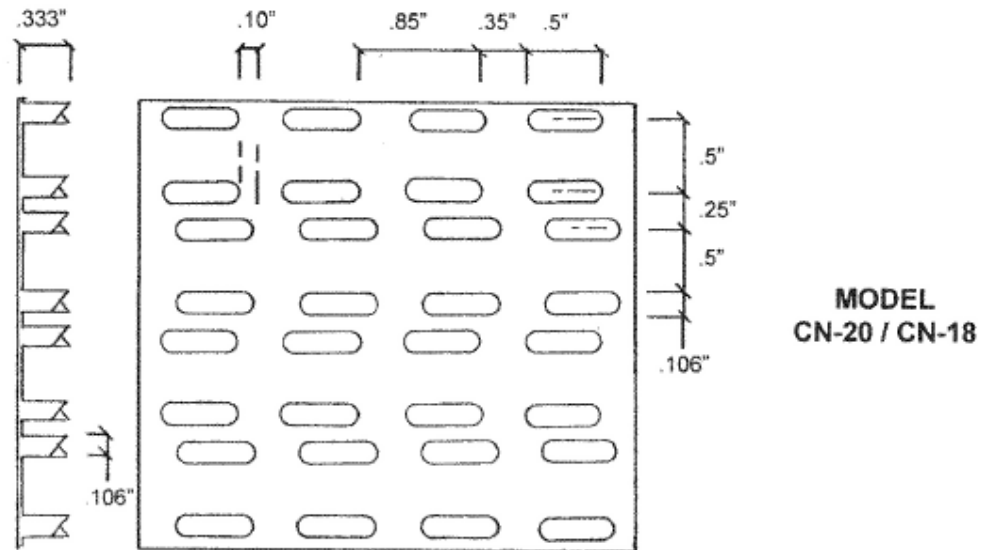
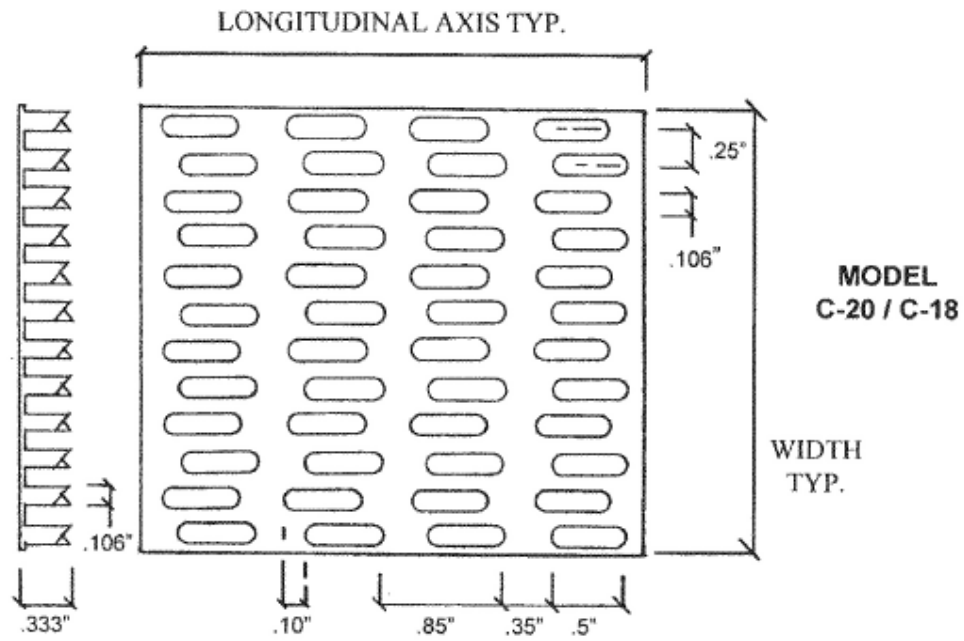


FIGURE 1—COMPUTRUS PLATE DIMENSIONS