



PFS TECO Research Report 0108

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TYPE OF ACCEPTANCE:

**Product Material – Metal Connector Plates for Wood Trusses
CSI Division 06 00 00 Wood, Plastics and Composites
CSI Section Shop-Fabricated Wood Trusses**

MANUFACTURER IDENTIFICATION:

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RESEARCH REPORT SUBJECT:

CH Machine CH20 Metal Connector Plates for Wood Trusses

DESCRIPTION OF BUILDING COMPONENTS:

This report covers light gauge galvanized steel plates known as truss connector plates. These connectors are used to join members of wood roof and floor trusses together. They resist tension, shear, and tooth withdrawal forces at the truss joints.

CH20 metal plate connectors are flat steel plates designed to connect wood members. The plates are manufactured from galvanized steel in various lengths and widths and have integral teeth that are designed to transmit lateral loads between the wood truss members

CH20 metal connector plates are manufactured from galvanized steel sheet complying with ASTM A653, SS, Grade 40 with a G60 galvanized coating, or 30Z30Z Electrolytic Zinc coating in accordance with ASTM A 879. The steel sheet has a minimum coated thickness of 0.035 inches.

Each CH20 metal plate connector has eight teeth per square inch. The teeth are 0.35 inches long and 0.125 inches wide. The teeth are punched perpendicular to the plane of the plate. Each punch creates two teeth of equal length leaving a slot in the plate. The slots are staggered 0.125 inches along the plate length from the adjacent rows and each row is 0.25 inches, center-to-center, from adjacent rows. Slots are spaced 1.00 inch, center-to-center, parallel to the plate length. See Figure 1 in this report.

All metal plate connectors must be pressed into wood for the full depth of the teeth by hydraulic-platen presses or single or multiple pass rollers of a minimum of 24 inches in diameter.

APPLICABLE CODES:

- 2009 *International Building Code*® (IBC)
- 2012 *International Building Code*® (IBC)
- 2015 *International Building Code*® (IBC)
- 2009 *International Residential Code*® (IRC)
- 2012 *International Residential Code*® (IRC)
- 2015 *International Residential Code*® (IRC)

APPLICABLE CHARACTERISTICS REVIEWED :

Structural Performance:

CH20 Truss Connector Plates have been evaluated for load capacity in shear, net section tension, and lateral resistance. Figure 1 in this report shows the CH20 Truss Connector Plate including its dimensions. Plates must be installed in identical pairs on opposite sides of the joint. The allowable design capacities shown in Tables 1 through 4 of this report are for a pair of identical plates installed one plate on each side of the joint.

APPLICABLE USES:

The CH Machine metal plate connectors described in this report are used for connecting wood truss members in accordance with the applicable paragraphs of Section 2304 of the IBC. They may also be used in structures regulated under the IRC when an engineered design is submitted in accordance with IRC Section R301.1.3.

LIMITATIONS OF ACCEPTANCE:

The CH Machine truss connector plates described in this report comply with or are suitable alternative to what is specified in those codes listed in the Applicable Codes Section of this report, subject to the following conditions:

Trusses using the connector plates described in this report must be assembled in accordance with Chapter 3 of TPI 1-2014 and IBC Section 2303.4 or IRC Section R502.11 or IRC Section R802.10.

Each application for a building permit using the CH Machine CH20 metal plate connectors must be accompanied by documentation showing that the design, manufacture and proposed truss installation conforms with the requirements of the applicable Sections of 2303.4 of the IBC or Sections R502.11 or R8902.10 of the IRC. The truss design drawings must be prepared by a registered design professional and must bear the seal and signature of the truss designer.

This report establishes allowable metal plate connector design values only. The design values (lateral resistance values, effective tension strength ratios, and effective shear resistance ratios) used in the design of trusses using CH Machine metal plate connectors must not exceed those listed in Tables 1 through 4 of this report. Building design load combination reductions must be in accordance with the applicable code.

All lumber used in the fabrication of trusses using CH Machine Metal plate connectors shall be graded in compliance with the applicable building code and shall have a moisture content not to exceed 19 percent at the time of truss assembly. The use of this report for metal plate connectors embedded in either fire-retardant-treated lumber or preservative-treated lumber or for use in corrosive environments has not been evaluated and is outside the scope of this report.

Metal plate connectors must be installed in pairs on opposite faces of the truss members.

DOCUMENTATION SUBMITTED:

Submitted data was provided in accordance with PFS TECO 1601 (quality control manual, specifications, manufacturer's installation instructions, test data, and description information).

PRODUCT IDENTIFICATION:

CH20 metal plate connectors must be identified by the "CH 20" mark embossed on the surface in accordance with ANSI/TPI 1-2014, Section 4.5.

Table 1 CH Machine CH 20 Hydraulic Platen Embedment Values (psi per pair of plates)^{1,2}

Method	Hydraulic Platen Embedment Values			
Orientation	AA	EA	AE	EE
Wide Face	232	196	176	205

¹ End and edge distances are zero. Use these values also for multiple pass roller embedment with rollers that are 24 inches in diameter minimum.

² Values are for Southern Yellow Pine (SG 0.55 or greater)

Table 2 CH Machine CH20 Single Pass 24" Diameter Roller Embedment Values (psi per pair of plates)¹

Method	Single Pass 24" Roller Embedment Values			
Orientation	AA	EA	AE	EE
Wide Face	219	199	184	195

¹ Values are for Southern Yellow Pine (SG 0.55 or greater)

Table 3 CH Machine CH20 Tension Force Design Values

Plate Orientation	Joint Location	Allowable Tension Load (Pounds per Linear Inch per Pair of Plates)	Tensile Effectiveness Ratio
Width Perpendicular To Grain	Metal Over Joint ¹	1331 ¹	0.688 ¹
Width Perpendicular To Grain	Slot Over Joint	994	0.514
Length Perpendicular To Grain	Slot Over Joint	997	0.515

¹ This plate orientation is a deviation from the test standard and is given for reference purposes only.

Table 4 CH Machine CH20 Shear Force Design Values

Shear Angle Orientation (Degrees)	Allowable Shear Load (Pounds per Linear Inch per Pair of Plates)	Shear Effectiveness Ratio
0	831	0.645
30	808	0.627
60	1054	0.818
90	650	0.505
120	604	0.469
150	618	0.480

Figure 1. CH20 Dimensions (Inches)

