

CCMC 13287-R

CCMC Canadian code compliance evaluation

CCMC number:	13287-R
Status:	Active
Issue date:	2007-09-10
Modified date:	2023-11-08
Evaluation holder:	<p>Credit Valley Steel Products Inc 6393 Yatton Side Road R.R. # 2 Wallenstein ON N0B 2S0 Canada Telephone: 519-669-0510 / 800-461-1142</p>
Product names:	<ul style="list-style-type: none"> • ALMCAN Hurricane Tie • ALMCAN Joist Hangers • ALMCAN Rafter Tie
Compliance:	NBC 2015
Criteria:	CCMC-TG-060523.06-15, "CCMC Technical Guide for Joist Hangers"

In most jurisdictions this document is sufficient evidence for approval by Canadian authorities.

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Compliance opinion

It is the opinion of the Canadian Construction Materials Centre that the evaluated products, when used as joist hangers or framing connectors in accordance with the conditions and limitations stated in this evaluation, comply with the following code:

National Building Code of Canada 2015

Code provision	Solution type
4.3.1.1. Design Basis for Wood	<u>Acceptable</u>
4.3.1.1. Design Basis for Wood	<u>Alternative</u>
9.23.3.4. Nailing of Framing	<u>Alternative</u>
9.23.9.2.(2)(a) Joist hangers or other acceptable connectors	<u>Acceptable</u>
9.23.9.2.(2)(b) Joists Supported by Beams	<u>Alternative</u>
9.23.9.7. Support of Tail and Header Joists	<u>Acceptable</u>

The above opinion(s) is/are based on the evaluation by the CCMC of technical evidence provided by the evaluation holder, and is bound by the stated conditions and limitations. For the benefit of the user, a summary of the technical information that forms the basis of this evaluation has been included.

Product information

Product names

- ALMCAN Hurricane Tie
- ALMCAN Joist Hangers
- ALMCAN Rafter Tie

Product description

The joist hangers identified in the [Results of testing of factored resistances of the hanger series](#) table are used to transfer the loads from the supported member to the supporting member. They are face-mount hangers that are fabricated in cold-form with light steel gauge. The steel gauge of the hangers is indicated in the [Results of testing of factored resistances of the hanger series](#) table. A typical drawing of the hanger model series is shown in [Figure 1](#).

The hurricane tie and rafter tie identified in the [Results of testing of factored resistances of the hurricane tie and rafter tie](#) table are used where additional protection is required against wind uplift from seismic and wind loads. They are fabricated in cold-form with light steel gauge. The steel gauge of the connectors is indicated in the [Results of testing of factored resistances of the hurricane tie and rafter tie](#) table. A typical drawing of the connector model is shown in [Figure 2](#).

The steel of the hangers with model No. 452 to 462 is coated with a corrosion protection of G153 designation from the standard ASTM A 653/A 653M-04, "Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process." The steel of the other hangers and connectors is coated with a corrosion protection of G60.

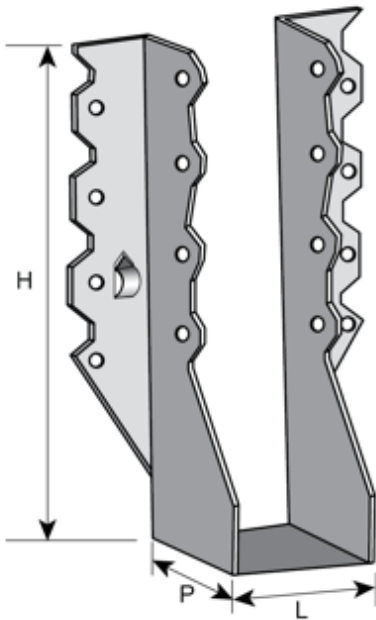


Figure 1. Joist hanger

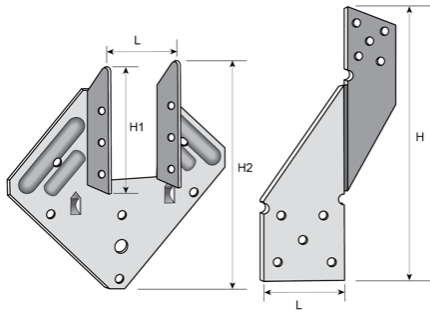


Figure 2. Hurricane tie-down and rafter tie

Manufacturing plant

This evaluation is valid only for products produced at the following plant:

Product names	Manufacturing plant
	Wallenstein, ON, CA
ALMCAN Hurricane Tie	☑
ALMCAN Joist Hangers	☑
ALMCAN Rafter Tie	☑

☑ Indicates that the product from this manufacturing facility has been evaluated by the CCMC

Conditions and limitations

The CCMC's compliance opinion is bound by this product being used in accordance with the conditions and limitations set out below.

- The pre-engineered wood members assembled with the evaluated joist hangers must be designed in accordance with Part 4 of Division B of the NBC 2015 by a professional engineer licensed to practise under a provincial or territorial legislation.
- The joist hangers are used to support joists consisting of lumber, wood trusses, glued-laminated timber, prefabricated wood I-joists or structural composite lumber. The pre-engineered wood members must conform to the manufacturer's specifications and instructions (e.g., web stiffeners, filler blocks and backer blocks for I-joists).
- The design values (factored resistances) for joist hangers provided in this Report are valid for the wood species and the hanger models shown in the [Results of testing of factored resistances of the hanger series](#) table. However, the design value (factored resistance) can be valid for other wood products provided that:
 - the relative density (or compressive strength perpendicular to grain, f_{cp}) of the proposed wood product is equal or superior to the actual wood product tested with the hanger; and
 - where structural composite lumber (SCL) products are intended to be used, only TimberStrand® (LSL), Parallam® (PSL) and laminated veneer lumber (LVL) of vertical veneer are acceptable. Southgate Manufacturing Inc. must confirm acceptance of the use of a SCL product with their hanger and provide installation instructions.
- Fastener specifications shown in the [Results of testing of factored resistances of the hanger series](#) and [Results of testing of factored resistances of the hurricane tie and rafter tie](#) tables must be used for the published values to be valid. The joist hanger must be fastened to both the supported member and supporting member. All fastener holes must be filled, or there must be a minimum number of nails as per the engineer's specifications.
- The hanger must not display any fracturing in either the protective coating or the base metal.
- When used in attics, at rim boards or in high humidity or corrosive environments, the user must consult the manufacturer to determine the appropriate level of corrosion protection for the intended use of the joist hanger and connector.
- The products must be installed by an informed and knowledgeable installer.
- The products listed in the [Results of testing of factored resistances of the hanger series](#) and [Results of testing of factored resistances of the hurricane tie and rafter tie](#) tables must be identified with the phrase "CCMC 13287-R."

Technical information

This evaluation is based on demonstrated conformance with the following criteria:

Criteria number	Criteria name
CCMC-TG-060523.06-15	CCMC Technical Guide for Joist Hangers

The evaluation holder has submitted technical documentation for the CCMC's evaluation. Testing was conducted at laboratories recognized by the CCMC. The corresponding technical evidence for this product is summarized below.

Performance requirements

Table 1. Results of testing of factored resistances ⁽¹⁾ of the hanger series

Model No.	Mat. (ga.)	Hanger dimensions (mm)			Wood members tested		Fastener schedule		Factored resistance (kN)
		W	H	D	Header	Joist	Header	Joist	
210	22	39.7	127	44.5	1 – 38 × 140 SPF	1 – 38 × 140 SPF	6 – 10d × 1.5 in.	4 – 10d × 1.5 in.	4.09
210	22	39.7	127	44.5	1 – 38 × 184 SPF	1 – 38 × 184 SPF	6 – 10d × 1.5 in.	4 – 10d × 1.5 in.	3.94
212	22	77.8	127	44.5	1 – 38 × 140 SPF	2 – 38 × 140 SPF	6 – 10d × 1.5 in.	6 – 10d × 1.5 in.	4.38
216	22	39.7	171.5	44.5	1 – 38 × 184 SPF	1 – 38 × 184 SPF	8 – 10d × 1.5 in.	8 – 10d × 1.5 in.	5.45
216	22	39.7	171.5	44.5	1 – 38 × 235 SPF	1 – 38 × 235 SPF	8 – 10d × 1.5 in.	8 – 10d × 1.5 in.	5.83
218	22	77.8	171.5	44.5	1 – 38 × 184 SPF	2 – 38 × 184 SPF	10 – 10d × 1.5 in.	10 – 10d × 1.5 in.	6.61
220	22	39.7	203.2	44.5	1 – 38 × 235 SPF	1 – 38 × 235 SPF	10 – 10d × 1.5 in.	10 – 10d × 1.5 in.	7.78
222	22	77.8	203.2	44.5	1 – 38 × 235 SPF	2 – 38 × 235 SPF	12 – 10d × 1.5 in.	10 – 10d × 1.5 in.	8.32
228	20	117.5	171.5	44.5	1 – 38 × 184 SPF	3 – 38 × 184 SPF	12 – 10d × 1.5 in.	12 – 10d × 1.5 in.	9.01
228	20	117.5	171.5	44.5	1 – 38 × 235 SPF	3 – 38 × 235 SPF	12 – 10d × 1.5 in.	12 – 10d × 1.5 in.	9.75
452-3	18	39.7	127	44.5	1 – 38 × 140 SPF	1 – 38 × 140 SPF	6 – 10d × 1.5 in.	4 – 10d × 1.5 in.	4.99
452-3	18	39.7	127	44.5	1 – 38 × 184 SPF	1 – 38 × 184 SPF	6 – 10d × 1.5 in.	4 – 10d × 1.5 in.	4.22

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Model No.	Mat. (ga.)	Hanger dimensions (mm)			Wood members tested		Fastener schedule		Factored resistance (kN)
		W	H	D	Header	Joist	Header	Joist	
454-3	18	77.8	127	44.5	1 – 38 × 140 SPF	2 – 38 × 140 SPF	6 – 10d × 1.5 in.	6 – 10d × 1.5 in.	5.42
456-3	18	39.7	171.5	44.5	1 – 38 × 184 SPF	1 – 38 × 184 SPF	8 – 10d × 1.5 in.	8 – 10d × 1.5 in.	5.91
456-3	18	39.7	171.5	44.5	1 – 38 × 235 SPF	1 – 38 × 235 SPF	8 – 10d × 1.5 in.	8 – 10d × 1.5 in.	6.99
458-3	18	77.8	171.5	44.5	1 – 38 × 184 SPF	2 – 38 × 184 SPF	10 – 10d × 1.5 in.	10 – 10d × 1.5 in.	6.84
460-3	18	39.7	203.2	44.5	1 – 38 × 235 SPF	1 – 38 × 235 SPF	10 – 10d × 1.5 in.	10 – 10d × 1.5 in.	7.47
462-3	18	77.8	203.2	44.5	1 – 38 × 235 SPF	2 – 38 × 235 SPF	12 – 10d × 1.5 in.	12 – 10d × 1.5 in.	10.98

Note:

- 1 Factored resistances of joist hangers are calculated in accordance with CSA O86-14, with standard load duration, dry service and no treatment.
- W = bearing width of the hanger, H = hanger height, and D = bearing depth of the hanger.
 - S-P-F = Spruce-Pine-Fir lumber (No. 2 or better).
 - S-P-F was tested and its density fell in the specified range of Table A.12.1 (Relative density values) of CSA O86-14.
 - Hot-dip galvanized common nails were used for testing.
 - A minimum specified ultimate tensile strength (Fu) of 369 MPa was used for Gauge 20 hanger calculations and 372 Mpa was used for Gauge 18 and 22 hanger.
 - Nail specifications in metric are:
 - 10d × 1.5 in. = 3.76 mm × 38.1 mm

Table 2. Results of testing of factored resistances ⁽¹⁾ of the hurricane tie and rafter tie

Model	Mat. (ga.)	Hanger dimensions (mm)			Wood members tested		Fastener schedule		Factored uplift resistance (kN)
		W	H (H1 for hurricane tie)	D (H2 for hurricane tie)	Header (connector)/plate (ties)	Joist (connector)/rafter (ties)	Header	Joist	
Hurricane tie No. 244	18	39.7	76.2	133.4	2 – 38 × 89 S-P-F	1 – 38 × 89 S-P-F	4 – 10d × 1.5 in.	6 – 10d × 1.5 in.	1.76
Rafter tie No. 245	18	38.1	136.5	–	2 – 38 × 89 S-P-F	1 – 38 × 89 S-P-F	5 – 8d × 1.5 in.	5 – 8d × 1.5 in.	3.94

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Note:

- 1 Factored resistances of joist hangers are calculated in accordance with CSA O86-14, with standard load duration, dry service and no treatment.
- W = bearing width of the hanger, H = hanger height, and D = bearing depth of the hanger.
 - S-P-F = Spruce-Pine-Fir lumber (No. 2 or better).
 - S-P-F was tested and its density fell in the specified range of Table A.12.1 (Relative density values) of CSA O86-14.
 - Hot-dip galvanized common nails were used for testing.
 - A minimum specified ultimate tensile strength (Fu) of 372 MPa was used for Gauge 18 hanger calculations.
 - Nail specifications in metric are:
 - 8d × 1.5 in. = 3.33 mm × 38.1 mm
 - 10d × 1.5 in. = 3.76 mm × 38.1 mm
-

Administrative information

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This assessment must be read in the context of the entire [CCMC Registry of Product Assessments](#), any applicable building code or by-law requirements, and/or any other regulatory requirements (for example, the [Canada Consumer Product Safety Act](#), the [Canadian Environmental Protection Act](#), etc.).

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CCMC recognition

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(Alliance of Canadian Building Official Associations (ACBOA))

First Nations National Building Officers Association (FNNBOA)



(First Nations National Building Officers Association (FNNBOA))

Canadian Home Builders' Association (CHBA)



(Canadian Home Builders' Association (CHBA))

Alberta Building Officials Association (ABOA)



(Alberta Building Officials Associations (ABOA))

Saskatchewan Building Officials Association (SBOA)



(Saskatchewan Building Officials Association (SBOA))

Manitoba Building Officials Association (MBOA)



(Manitoba Building Officials Association (MBOA))

Ontario Building Officials Association (OBOA)



(Ontario Building Officials Association (OBOA))

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(Nova Scotia Building Officials Association (NSBOA))

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For more information, contact the CCMC by phone at (613) 993-6189 or by email at ccmc@nrc-cnrc.gc.ca

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Code compliance as an acceptable solution

Code Compliance via Acceptable Solutions

If a building design (e.g. material, component, assembly or system) can be shown to meet all provisions of the applicable **acceptable solutions** in Division B (e.g. it complies with the applicable provisions of a referenced standard), it is deemed to have satisfied the objectives and functional statements linked to those provisions and thus to have complied with that part of the Code.

— National Building Code of Canada, Sentence A-1.2.1.1.(1)(a)

The CCMC has determined that compliance with this provision of the Code has been demonstrated as an **Acceptable Solution**. The evaluation report provides a summary of the basis of CCMC's compliance opinion.

CCMC's code compliance opinions

All CCMC evaluation reports are opinions of code compliance established in accordance with the National Building Code of Canada, Subsection 1.2.1. "Compliance with this Code," which requires compliance to be achieved by:

- complying with the applicable acceptable solutions in Division B, or
- using an alternative solution that will achieve at least the minimum level of performance required by Division B in the areas defined by the objective and functional statements attributed to the applicable acceptable solutions.

The CCMC assesses compliance with Canadian building, energy and safety codes, and is trusted by over 6,000 regulators across Canada.

Code compliance as an alternative solution

Code Compliance via Alternative Solutions

Where a design differs from the acceptable solutions in Division B, then it should be treated as an **"alternative solution."** A proponent of an alternative solution must demonstrate that the alternative solution addresses the same issues as the applicable acceptable solutions in Division B and their attributed objectives and functional statements. However, because the objectives and functional statements are entirely qualitative, demonstrating compliance with them in isolation is not possible. Therefore, Clause 1.2.1.1.(1)(b) identifies the principle that Division B establishes the quantitative performance targets that alternative solutions must meet. In many cases, these targets are not defined very precisely by the acceptable solutions [...] Nevertheless, Clause 1.2.1.1.(1)(b) makes it clear that an effort must be made to demonstrate that an alternative solution will perform as well as a design that would satisfy the applicable acceptable solutions in Division B—not “well enough” but “as well as.”

— National Building Code of Canada, Sentence A-1.2.1.1.(1)(b)

The CCMC has determined that compliance with this provision of the Code has been demonstrated as an **Alternative Solution**. The evaluation report provides a summary of the basis of CCMC's compliance opinion.

CCMC's code compliance opinions

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