



EVALUATION SUBJECT: EJOT FASTENING SYSTEMS LP EJOT SOLAR FLASHING SYSTEM

REPORT HOLDER:

EJOT Fastening Systems LP
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CSI Division: 06 WOOD AND PLASTICS
CSI Section: 06060 Connections and Fasteners

1.0 SCOPE OF EVALUATION

1.1 Compliance to the following codes & regulations:

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

1.2 Evaluated in accordance with:

- IAPMO UES Evaluation Criteria for Joist Hangers and Miscellaneous Connectors, EC 002, adopted January 2016
- UL 441 Standard for Gas Vents (2010 Section 27 Rain Test)

1.3 Properties assessed:

- Structural
- Water penetration

2.0 PRODUCT USE

EJOT Solar Flashing System is a structural flashing system used to attach solar mounting hardware to wood framed, asphalt shingled roofs. The system complies with IBC Section 2309 and is used with solar photovoltaic panels in accordance with IBC Sections 1509 and 1511 and IRC Section M2302.

3.0 PRODUCT DESCRIPTION

The EJOT Solar Flashing System is comprised of two basic components: the EJOT aluminum flashing with pre-installed conical-shaped EPDM washer and EPDM foam ring, and the EJOT Solar Fastening System JA3 screw-connector. The flashing is anodized aluminum, 1100 alloy H14d, 8 inches wide by 12 inches long (203 by 305 mm) by 0.04 inches thick (1 mm) with a ¼ inch high (6.3 mm) by approximately 1-inch (25.4 mm) diameter circular protrusion centered 3-inches (76 mm) from one end. The JA3 screw-connector is made from Type 304 stainless steel complying with ASTM A240, and is a continuous nominally 5/16 inch (8 mm actual) wood screw with a contiguous 3/16 inch (4.7 mm) diameter bolt connector. The JA3 screw-connector comes with two

washers, and a locknut. Figure 1 of this report illustrates the system.

4.0 DESIGN AND INSTALLATION

4.1 Design: The structural designer shall calculate the applicable design forces and relevant load combinations for the system from the applicable code and then compare the design forces against the allowable loads for the attachment as listed in this report. Where the attachments are exposed to in-service temperatures exceeding 100°F (37.8°C), uplift allowable loads shown in Table 1 of this report are adjusted by the temperature factor, C_t , in accordance with Section 10.3.4 of the ANSI/AWC National Design Specification for Wood Construction (NDS). When the products are attached to wood framing having an in-service moisture content greater than 19 percent (16 percent for engineered wood products), or where wet service is expected, the allowable loads are adjusted by the wet service factor, C_m , specified in Section 10.3.1 of the ANSI/AWC NDS. For the connection, the structural designer shall select a length of threaded lag screw that provides a minimum penetration of 2 inches (51 mm) into the wood framing member. The structural designer shall analyze the wood framing members for the applicable design forces and load combinations from the applicable code and then compare the load carrying capacity in accordance with the ANSI/AWC NDS. Installation of the EJOT Solar Flashing System is limited to roofs from 3 to 12 units vertical in 12 units horizontal (i.e. 3:12 to 12:12).

4.2 Installation: Installation shall be in accordance with the codes note in Section 1 of this report, this report and the manufacturer's installation instructions. The EJOT flashing is installed with the flashing under the course of asphalt shingles above in a weather-lap manner with the circular protrusion exposed. Connection of the flashing to the wood framing is provided by the JA3 screw-connector. Complete installation instructions for the EJOT Solar Flashing System for three tab asphalt shingle roofs is available at: www.ejot-usa.com. Wood screw installation into the wood framing shall comply with ANSI/AWC NDS Section 11.1.5.

5.0 LIMITATIONS

The EJOT Solar Flashing System described in this report is a suitable alternative to those codes listed in Section 1.0 of this report, and are subject to the following conditions:

5.1 EJOT Solar Flashing shall be installed in accordance with this evaluation report manufacturer's installation instructions, and the applicable code, and if there are any conflicts between the manufacturer's published installation instructions and this report, the more restrictive governs.

5.2 Calculations showing compliance with this report shall

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11.

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be submitted to the code official and conform to Section 4.0 of this report. Calculations shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.3 The lag screw portion of the JA3 screw-connector shall penetrate a minimum of 2 inches (51 mm) deep into the wood framing member.

5.4 Wood framing members shall be predrilled for installation of the lag screws in conformance with Section 11.1.13 of the (NDS) and the manufacturer's installation instructions (15/64 inch (6 mm) pilot hole). Edge and end distances of the lag screw in the wood framing member shall be sufficient to prevent unusual splitting and not less than the requirements of Table 11.5.1A through E of the ANSI/AWC NDS.

5.5 Allowable loads are based on allowable strength design and include load duration factors in accordance with the ANSI/AWC National Design Specification for Wood Construction (NDS) where applicable. No additional increased in capacity are allowed.

5.6 Specific gravity of the wood framing member shall meet or exceed 0.42, such as occurs for Spruce-Pine-Fir (0.42), Douglas Fir-Larch (0.50) or Southern Pine (0.55).

5.7 Upper edge of the flashing shall rest beneath two courses of asphalt shingles to prevent water penetration between the shingle and the flashing.

5.8 Manufacturer's installation instructions shall be provided to the code official upon request for inspection purposes.

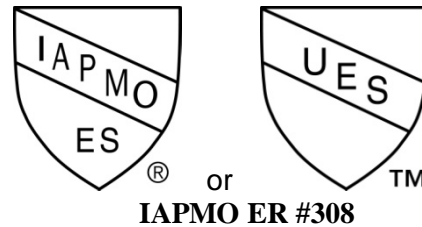
6.0 SUBSTANTIATING DATA

6.1 Data in accordance with the IAPMO UES Evaluation Criteria for Joist Hangers and Miscellaneous Connectors, EC 002, adopted January 2016.

6.2 Rain test data in accordance with Underwriters Laboratory Standard for Gas Vents UL 441 (Section 27) for roof slope of 2 units vertical to 12 units horizontal.

7.0 IDENTIFICATION

Packages of EJOT Solar Flashing System are labeled with the name (EJOT), model name (EJOT Solar Flashing Kit) the package quantity, the production batch number, and the IAPMO UES Uniform Evaluation Service mark of conformity and Uniform Evaluation Report number (ER-308).



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For additional information about this evaluation report please visit
www.uniform-es.org or email at info@uniform-es.org

TABLE 1: ALLOWABLE LOADS

Load Direction	Minimum Specific Gravity	Allowable Load at 1/8" deflection (lbs)	Allowable Load at 1/4" deflection (lbs)
Uplift	0.42	690 (4.4" embedment into wood framing required)	690 (4.4" embedment into wood framing required)
Uplift	0.54	532 (2" embedment into wood framing required)	778 (3" embedment into wood framing required)
Lateral	0.42	550	550
Lateral	0.54	1,118	1,118

Notes:

- Allowable load values are based on the least value from the ultimate load of three tests (strength limit), tested load at specified deflections (deflection limit), or calculated fastener capacity (withdrawal and lateral) for wood at the specified specific gravity or greater.
- Allowable load values are based on lumber with all of the following characteristics:
 - Located in dry service conditions where moisture content does not exceed 19% for an extended period of time such as in most covered structures.
 - Located where it does not experience sustained exposure to elevated temperatures that exceed 100°F.
 - For any other conditions, allowable table values shall be multiplied by the related adjustment factors (C_m and or C_t) in accordance the ANSI/AWC National Design Specification for Wood Construction (NDS).
- Allowable load values are based on lumber with a specific gravity 0.42 or greater.
- Allowable load values for withdrawal are based on the minimum required penetration as shown into the roof rafter by a single 5/16 inch diameter stainless steel JA3 screw-connector.
- Allowable values shall not be increased for load duration in accordance with Section 10.3.2 of the ANSI/AWC NDS.

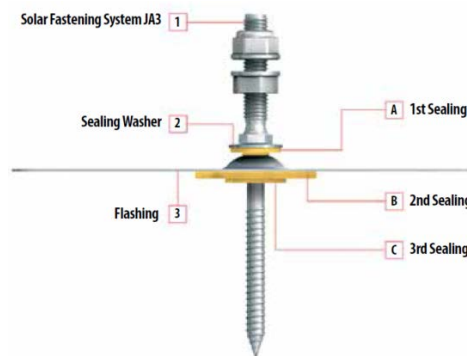


Figure 1 – JA3 Screw-Connector