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# ICC-ES Report

## ESR-3507

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**DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**

**SECTION: 06 05 23.13—NAILS**

**REPORT HOLDER:**

**ASTROTECH STEELS PRIVATE LIMITED**

1335 CANNON ROAD, SECTOR 36, SRI CITY SEZ  
SATYAVEDU MANDAL, CHITTOOR DISTRICT  
ANDHRA PRADESH 517588  
INDIA

**EVALUATION SUBJECT:**

**NAILS**



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**DIVISION: 06 00 00—WOOD, PLASTICS, AND  
COMPOSITES****Section: 06 05 23.13—Nails****REPORT HOLDER:****ASTROTECH STEELS PRIVATE LIMITED  
1335 CANNON ROAD, SECTOR 36, SRI CITY SEZ  
SATYAVEDU MANDAL, CHITTOOR DISTRICT  
ANDHRA PRADESH 517588  
INDIA  
+91 44 43009061  
[www.astrotechsteels.com](http://www.astrotechsteels.com)****EVALUATION SUBJECT:****NAILS****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2012 and 2009 *International Building Code*® (IBC)
- 2012 and 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)<sup>†</sup>

<sup>†</sup>The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

**Properties evaluated:**

- Bending yield strength
- Compliance with material requirements and tolerances of ASTM F1667.
- Compliance with prescriptive requirements of the IBC and IRC.

**2.0 USES**

The Astrotech nails are used for engineered and non-engineered (prescriptive) structural connections.

**3.0 DESCRIPTION**

The Astrotech nails are sold under the brand names of Astrotech, AstroMach and AJFast. The nails have full round heads, offset heads or clipped heads and diamond points. The nails are formed from carbon steel wire. Nails with coating designated as EG are electro-galvanized and comply with ASTM A641, Class 1. Nails with coating designated as HD are hot-dip galvanized and comply with ASTM A153, Class D. Both EG and HD nails comply with the requirements of Section 10.1 of ASTM F1667. See Table 1 for nail designations, dimensions and additional descriptive information, including bending yield strength. Dimensional tolerances conform to ASTM F1667. The nails

are available as individual (bulk) nails, or are collated as indicated in Table 1.

**4.0 DESIGN AND INSTALLATION****4.1 Design:**

**4.1.1 Engineered Structural Connections:** The Astrotech nails comply with the requirements of IBC Section 2303.6 and may be used in connections designed in accordance with the NDS, using the design bending yield strengths and the nail diameters shown in Table 1.

**4.1.2 Engineered Diaphragms and Shear Walls and Prescriptive Braced Walls:** The Astrotech nails listed in Table 2 comply with the requirements of IBC Section 2303.6 and Table 15 of ASTM F1667, and may be used where the listed size of nail is prescribed for use in engineered diaphragms and shear walls in accordance with the SDPWS, which is referenced in the IBC; and where the listed nail size is prescribed in the IBC or IRC for use in braced walls, as applicable.

**4.1.3 Prescriptive Framing Connections:** The Astrotech nails listed in Table 3 comply with the requirements of IBC Section 2303.6 and may be used in framing connections where the listed size of nail is prescribed in the IBC or IRC, as applicable.

**4.2 Installation:**

The nails must be installed in accordance with this report, the report holder's published installation instructions, the approved plans, if applicable, and the applicable prescriptions in the code.

The nails described in this report are packaged for use in power tools recommended by the report holder. Individual nails may be manually driven.

Edge distances, end distances, and spacing must be sufficient to prevent splitting of the wood. Installation must be in accordance with the applicable requirements of Section 11.1.6 of the NDS (Section 11.1.5 for the 2009 IBC).

**5.0 CONDITIONS OF USE**

The Astrotech nails 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** The nails must be installed in accordance with this report; the report holder's published installation instructions; the approved plans, if applicable; and the applicable provisions of the code. In the case of a conflict amongst these documents, the most restrictive requirements govern.

5.2 Use of the nails with a bright finish in chemically treated wood, such as pressure-, preservative-, or fire-retardant-treated wood, or in exterior or exposed conditions, is not permitted. Use of the electro-galvanized nails in chemically treated wood or in exterior or exposed conditions is outside the scope of this report.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Nails (AC116), dated February 2013 (editorially revised August 2013).

## 7.0 IDENTIFICATION

Packages of nails are identified by the brand name (Astrotech, AstroMach or AJFast), the nail description (shank type, diameter, length and finish/coating) and the evaluation report number (ESR-3507).

TABLE 1—ASTROTECH NAILS

| NOMINAL DIAMETER (inch) | RANGE OF LENGTHS (inches)                                     | HEAD STYLE <sup>1</sup> | NOMINAL HEAD DIAMETER (inch) | SHANK TYPE | COATING   | SPECIFIED BENDING YIELD STRENGTH $F_{yb}$ (psi) | PACKAGING                      |
|-------------------------|---|-------------------------|------------------------------|------------|-----------|---|--------------------------------|
| 0.099                   | 1 <sup>1</sup> / <sub>8</sub> - 2 <sup>1</sup> / <sub>2</sub> | Full round              | 0.238                        | Smooth     | X, HD, EG | 100,000   | Bulk, wire coil                |
| 0.099                   | 1 <sup>1</sup> / <sub>8</sub> - 2 <sup>1</sup> / <sub>2</sub> |                         | 0.238                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.099                   | 1 <sup>1</sup> / <sub>8</sub> - 2 <sup>1</sup> / <sub>2</sub> |                         | 0.238                        | Screw      | X, HD, EG | 100,000   |                                |
| 0.113                   | 1 <sup>1</sup> / <sub>4</sub> - 3                             | Full round              | 0.277                        | Smooth     | X, HD, EG | 100,000   | Bulk, plastic strip, wire coil |
| 0.113                   | 1 <sup>1</sup> / <sub>4</sub> - 3                             |                         | 0.277                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.113                   | 1 <sup>1</sup> / <sub>4</sub> - 3                             |                         | 0.277                        | Screw      | X, HD, EG | 100,000   |                                |
| 0.113                   | 2 - 2 <sup>1</sup> / <sub>2</sub>                             | Clipped                 | 0.269                        | Smooth     | X, HD, EG | 100,000   | Paper tape                     |
| 0.113                   | 2 - 2 <sup>1</sup> / <sub>2</sub>                             |                         | 0.269                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.113                   | 2 - 3 <sup>1</sup> / <sub>2</sub>                             | Offset                  | 0.258                        | Smooth     | X, HD, EG | 100,000   | Paper tape                     |
| 0.113                   | 2 - 3 <sup>1</sup> / <sub>2</sub>                             |                         | 0.258                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.120                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             | Full round              | 0.277                        | Smooth     | X, HD, EG | 100,000   | Bulk, plastic strip            |
| 0.120                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             |                         | 0.277                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.120                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             |                         | 0.277                        | Screw      | X, HD, EG | 100,000   |                                |
| 0.120                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             | Full round              | 0.280                        | Smooth     | X, HD, EG | 100,000   | Wire coil                      |
| 0.120                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             |                         | 0.280                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.120                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             |                         | 0.280                        | Screw      | X, HD, EG | 100,000   |                                |
| 0.120                   | 2 <sup>3</sup> / <sub>4</sub> - 3 <sup>1</sup> / <sub>2</sub> | Clipped                 | 0.277                        | Smooth     | X, HD, EG | 100,000   | Paper tape                     |
| 0.120                   | 2 <sup>3</sup> / <sub>4</sub> - 3 <sup>1</sup> / <sub>2</sub> |                         | 0.277                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.120                   | 2 - 3 <sup>1</sup> / <sub>2</sub>                             | Offset                  | 0.258                        | Smooth     | X, HD, EG | 100,000   | Paper tape                     |
| 0.120                   | 2 - 3 <sup>1</sup> / <sub>2</sub>                             |                         | 0.258                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.131                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             | Full round              | 0.280                        | Smooth     | X, HD, EG | 100,000   | Bulk                           |
| 0.131                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             |                         | 0.280                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.131                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             |                         | 0.280                        | Screw      | X, HD, EG | 100,000   |                                |
| 0.131                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             | Full round              | 0.277                        | Smooth     | X, HD, EG | 100,000   | Plastic strip, wire coil       |
| 0.131                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             |                         | 0.277                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.131                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             |                         | 0.277                        | Screw      | X, HD, EG | 100,000   |                                |
| 0.131                   | 3 - 3 <sup>1</sup> / <sub>2</sub>                             | Clipped                 | 0.277                        | Smooth     | X, HD, EG | 100,000   | Paper tape                     |
| 0.131                   | 3 - 3 <sup>1</sup> / <sub>2</sub>                             |                         | 0.277                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.131                   | 2 - 3 <sup>1</sup> / <sub>2</sub>                             | Offset                  | 0.258                        | Smooth     | X, HD, EG | 100,000   | Paper tape                     |
| 0.131                   | 2 - 3 <sup>1</sup> / <sub>2</sub>                             |                         | 0.258                        | Ring       | X, HD, EG | 100,000   |                                |
| 0.148                   | 2 - 4   | Full round              | 0.287                        | Smooth     | X, HD, EG | 90,000  | Bulk, plastic strip            |
| 0.148                   | 2 - 4   |                         | 0.287                        | Ring       | X, HD, EG | 90,000  |                                |
| 0.148                   | 2 - 4   |                         | 0.287                        | Screw      | X, HD, EG | 90,000  |                                |
| 0.162                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             | Full round              | 0.315                        | Smooth     | X, HD, EG | 90,000  | Bulk, plastic strip            |
| 0.162                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             |                         | 0.315                        | Ring       | X, HD, EG | 90,000  |                                |
| 0.162                   | 2 <sup>1</sup> / <sub>4</sub> - 4                             |                         | 0.315                        | Screw      | X, HD, EG | 90,000  |                                |

For SI: 1 inch = 25.4 mm, 1 psi = 6.89 kPa,

<sup>1</sup>See Figure 1 for a description of the head styles.

**TABLE 2—ASTROTECH NAILS FOR USE IN ENGINEERED DIAPHRAGMS AND SHEAR WALLS AND PRESCRIPTIVE BRACED WALLS UNDER THE IBC AND IRC**

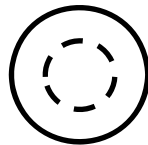
| NAIL TYPE AND SIZE PRESCRIBED IN THE CODE            | ASTROTECH NAIL DESCRIPTION   |
|--|--|
| 6d common (2" x 0.113")                              | 2 to 2 <sup>3</sup> / <sub>8</sub> " x 0.113"; full round head; smooth; X, HD or EG  |
| 8d common (2 <sup>1</sup> / <sub>2</sub> " x 0.131") | 2 <sup>1</sup> / <sub>2</sub> " to 3" x 0.131"; full round head; smooth; X, HD or EG |

For SI: 1 inch = 25.4 mm.

**TABLE 3—ASTROTECH NAILS FOR USE IN PRESCRIPTIVE FRAMING CONNECTIONS UNDER THE IBC AND IRC**

| NAIL TYPE AND SIZE PRESCRIBED IN THE CODE              | ASTROTECH NAIL SIZE AND TYPE  |
|--|---|
| 6d common (2" x 0.113")                                | 2 to 2 <sup>3</sup> / <sub>8</sub> " x 0.113"; smooth; X, HD or EG  |
| 6d deformed (2" x 0.113")                              | 2 to 2 <sup>3</sup> / <sub>8</sub> " x 0.113"; ring, screw; X, HD or EG                                       |
| 2 <sup>3</sup> / <sub>8</sub> " x 0.113"               | 2 <sup>3</sup> / <sub>8</sub> " to 2 <sup>1</sup> / <sub>2</sub> " x 0.113"; smooth, ring, screw; X, HD or EG |
| 8d common (2 <sup>1</sup> / <sub>2</sub> " x 0.131")   | 2 <sup>1</sup> / <sub>2</sub> " to 3" x 0.131"; smooth; X, HD or EG   |
| 8d deformed (2 <sup>1</sup> / <sub>2</sub> " x 0.131") | 2 <sup>1</sup> / <sub>2</sub> " to 3" x 0.131"; ring, screw; X, HD or EG                                      |
| 3" x 0.131", 3" x 0.128"                               | 3" to 3 <sup>1</sup> / <sub>2</sub> " x 0.131"; smooth, ring, screw; X, HD or EG                              |
| 10d common (3" x 0.148")                               | 3" to 3 <sup>1</sup> / <sub>2</sub> " x 0.148"; smooth; X, HD or EG   |
| 10d deformed (3" x 0.148")                             | 3" to 3 <sup>1</sup> / <sub>2</sub> " x 0.148"; ring, screw; X, HD or EG                                      |
| 16d common (3 <sup>1</sup> / <sub>2</sub> " x 0.162")  | 3 <sup>1</sup> / <sub>2</sub> " to 4" x 0.162"; smooth; X, HD or EG   |

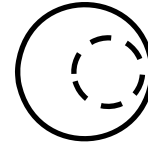
For SI: 1 inch = 25.4 mm.



Full Round



Clipped



Offset

**FIGURE 1—NAIL HEAD STYLES**

**ICC-ES Evaluation Report****ESR-3507 CBC and CRC Supplement**

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SATYAVEDU MANDAL, CHITTOOR DISTRICT  
ANDHRA PRADESH 517588  
INDIA  
+91 44 43009061  
[www.astrotechsteels.com](http://www.astrotechsteels.com)**EVALUATION SUBJECT:****NAILS****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that Astrotech nails, recognized in ICC-ES master evaluation report ESR-3507, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2013 *California Building Code* (CBC), Chapter 23
- 2013 *California Residential Code* (CRC), Chapters 5, 6, 7, 8 and 9

**2.0 CONCLUSIONS****2.1 CBC:**

The Astrotech nails, described in Sections 2.0 through 7.0 of the master evaluation report ESR-3507, comply with CBC Chapter 23, provided the design and installation are in accordance with the 2012 *International Building Code*® provisions noted in the master report and the additional requirements of CBC Chapter 23, as applicable.

**2.2 CRC:**

The Astrotech nails, described in Sections 2.0 through 7.0 of the master evaluation report ESR-3507, comply with CRC Chapters 5, 6, 7, 8 and 9, provided the design and installation are in accordance with the 2012 *International Residential Code*® provisions noted in the master report.

This supplement expires concurrently with the master report, reissued March 2016.

**ICC-ES Evaluation Report****ESR-3507 FBC Supplement**

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[www.astrotechsteels.com](http://www.astrotechsteels.com)**EVALUATION SUBJECT:****NAILS****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that Astrotech nails, recognized in ICC-ES master report ESR-3507, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2010 *Florida Building Code—Building*
- 2010 *Florida Building Code—Residential*

**2.0 CONCLUSIONS**

The Astrotech nails, described in Sections 2.0 through 7.0 of the master evaluation report ESR-3507, comply with the 2010 *Florida Building Code—Building* and the 2010 *Florida Building Code—Residential*, provided the design and installation are in accordance with the *International Building Code*® provisions noted in the master report.

Use of the Astrotech nails for compliance with the High-Velocity Hurricane Zone provisions of the 2010 *Florida Building Code—Building* and the 2010 *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this evaluation report.

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 March 2016.