DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES  
Section: 06 05 23—Wood, Plastic, and Composite Fastenings  

REPORT HOLDER:  
MITEK® INC.  
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CHESTERFIELD, MISSOURI  63017  
(951) 245-9525  
www.hardyframe.com  

EVALUATION SUBJECT:  
CINCH NUT™ SHRINKAGE COMPENSATION DEVICE:  
MODELS CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 AND CNX12  

1.0 EVALUATION SCOPE  
Compliance with the following codes:  

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see ESR-2190 LABC and LARC Supplement.  

Property evaluated:  
Structural  

2.0 USES  
The shrinkage compensation devices described in this report are used in conjunction with hold-down and tension-tie connectors, as part of a restraint system in wood-frame construction, to remove slack from the system by compensating for shrinkage and settlement of the wood framing.  

3.0 DESCRIPTION  
3.1 General:  
The Cinch Nut is a prefabricated assembly consisting of a housing, a housing top and bottom, four internally threaded ratcheting nut quadrants with springs in the top of each quadrant, and an internal C-ring. The housing is a hollow cylindrical piece containing the nut quadrants. The housing top and bottom are plates that are attached to the top and bottom of the housing with two screws. The nut quadrants are bound together by the spring-like internal C-ring within the housing. See Figures 1 and 2.  
The Cinch Nut is installed on a threaded anchor rod and fastened to the wood framing of the structure. As the wood framing members shrink or settle the Cinch Nut ratchets downward along the axis of the threaded anchor rod without transferring any appreciable force into the anchor rod. When an uplift force is applied, the Cinch Nut engages and transfers a tensile force to the anchor rod and a bearing force through a steel bearing plate into the wood framing. The CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11, and CNX12 models are designed, respectively, for 3/8-inch-, 1/2-inch-, 5/8-inch-, 3/4-inch-, 7/8-inch-, 1-inch-, 1 1/8-inch-, 1 1/4-inch-, 1 3/8-inch-, and 1 1/2-inch-diameter (9.5 mm, 12.7 mm, 15.9 mm, 19.1 mm, 22.2 mm, 25.4 mm, 28.6 mm, 31.7 mm, 34.9 mm, and 38.1 mm) threaded rods. See Figure 1 for dimensions of each model.  

3.2 Materials:  
3.2.1 Cinch Nut: The Cinch Nut housing is manufactured from Chinese standard GB3077-88, 35CrMo steel, with a hardness of Rockwell 25-38 C. The housing top and bottom are manufactured from Chinese standard GB-T700-2006, Q235 steel, with a minimum hardness of Rockwell 45 B. The internally threaded nut quadrants are manufactured from Chinese standard GB3077-88, 35CrMo steel, with a hardness of Rockwell 30-40 C. The internal C-ring is manufactured from Chinese standard GB700-88, 65Mn steel wire. The compression springs in the tops of the nut quarters are manufactured from Chinese standard GB3077-88, 35CrMo steel, with a hardness of Rockwell 25-38 C. Each of these parts has a zinc-plated finish, with the exception of the internal C-ring and compression springs.  

3.2.2 Threaded Rod: Threaded rod used with the Cinch Nut must comply with the applicable code and the thread specifications noted in Table 1.  

4.0 DESIGN AND INSTALLATION  
The Cinch Nut is installed by inserting it over, and sliding it downward along, the threaded anchor rod until it rests on top of the bearing plate or hold-down device. The Cinch Nut must be positioned on the threaded rod such that the threaded rod extends a minimum of two full-thread pitches above the plane formed by the top surface of the Cinch Nut. The Cinch Nut must then be attached to the wood framing such that it maintains tight contact with the bearing plate as the wood framing shrinks or settles. Cinch Nuts used in plated systems must be secured into position.
through the steel bearing plate to the top of the wood sill plate or top plate using two 1/4-inch-by-3-inch (6.4 mm by 76 mm) lag screws, as shown in Figure 2. Lag screws must be installed in accordance with applicable provisions of the ANSI/AWC National Design Specification® for Wood Construction (NDS). The threaded rod with which the Cinch Nut is used must be installed plumb, such that the offset angle between the top of the floor and the bottom of the top plates or bridge block above does not exceed 2.0 degrees from vertical. The Cinch Nut has an unlimited shrinkage and/or settling compensation capacity, provided there are no obstructions or discontinuities, such as couplers, located within the expected range of movement along the threaded rod.

Allowable loads, deflection at allowable loads, and average travel and seating increments, \( \Delta R \), for Cinch Nuts are given in Table 1. The design of other elements within the restraint system, including threaded rods, bearing plates, anchors, and wood framing members, must be performed by others to the satisfaction of the code official.

5.0 CONDITIONS OF USE

The Cinch Nut shrinkage compensation devices 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 devices must be manufactured and identified in accordance with this report.

5.2 The devices must be installed in accordance with this report, the manufacturer’s published installation instructions and the plans approved by the code official. In the event of a conflict between this report and the manufacturer’s published installation instructions, this report governs.

5.3 The design values given in this report are for the Cinch Nut device alone. Calculations, demonstrating that the design loads do not exceed the allowable loads, must be submitted to the code official for approval. The calculations must be prepared by a registered design professional when required by the statutes of the jurisdiction in which the project is to be constructed.

5.4 When using the basic allowable stress design load combinations in accordance with IBC Section 1605.3.2, allowable loads are not permitted to be increased for wind or earthquake loading. No increase in allowable loads or reduction of applied loads for wind or earthquake is allowed when design uses the IRC.

5.5 The devices are limited to installations in dry, interior locations.

5.6 Use of the devices in contact with preservative-treated wood is outside of the scope of this report.

5.7 The Cinch Nut must not be used to support any dead load other than its own weight.

5.8 When the devices are used in continuous rod systems that resist light-frame shear wall overturning forces, calculations shall be submitted to the code official confirming that the total vertical displacement, which would include steel rod elongation and the shrinkage compensating device deflection, is less than or equal to 0.200 inch (5 mm) for each story, or between restraints, whichever is more restrictive, using allowable stress design (ASD). Shear wall drift limit calculations shall consider the 0.200-inch (5 mm) vertical displacement limit. This 0.200-inch (5 mm) vertical displacement limit may be exceeded when it can be demonstrated that the shear wall story drift limit and the deformation compatibility requirements of IBC Section 1604.4 are met when all sources of vertical displacement are considered.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Shrinkage Compensating Devices (AC316), dated June 2013 (Editorially revised November 2017).

7.0 IDENTIFICATION

Cinch Nuts are packaged in boxes with labels identifying the report holder name (MiTek), the model number, and the evaluation report number (ESR-2190). Additionally, each individual component, other than the bottom, C-ring and compression ring, of the Cinch Nut bears a stamp identifying the lot number, and the housing top bears additional stamps identifying the model number and the evaluation report number (ESR-2190).
### TABLE 1—THREAD SPECIFICATIONS, ALLOWABLE LOADS, AND DEFLECTION AT ALLOWABLE LOADS FOR CINCH NUTS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>CINCH NUT MODEL DESIGNATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thread specification required for threaded rod used with Cinch Nut</td>
<td></td>
</tr>
<tr>
<td>(per ANSI/ASME B1.1)</td>
<td></td>
</tr>
<tr>
<td>Thread specification required for threaded rod used with Cinch Nut</td>
<td>CNX3-1/8 - 16 UNC-2A</td>
</tr>
<tr>
<td>(per ANSI/ASME B1.1)</td>
<td>CNX4-1/2 - 13 UNC-2A</td>
</tr>
<tr>
<td>Thread specification required for threaded rod used with Cinch Nut</td>
<td>CNX5-5/8 - 11 UNC-2A</td>
</tr>
<tr>
<td>(per ANSI/ASME B1.1)</td>
<td>CNX6-3/4 - 10 UNC-2A</td>
</tr>
<tr>
<td>Thread specification required for threaded rod used with Cinch Nut</td>
<td>CNX7-7/8 - 9 UNC-2A</td>
</tr>
<tr>
<td>(per ANSI/ASME B1.1)</td>
<td>CNX8-1 - 8 UNC-2A</td>
</tr>
<tr>
<td>Thread specification required for threaded rod used with Cinch Nut</td>
<td>CNX9-1 1/4 - 7 UNC-2A</td>
</tr>
<tr>
<td>(per ANSI/ASME B1.1)</td>
<td>CNX10-1 1/2 - 7 UNC-2A</td>
</tr>
<tr>
<td>Thread specification required for threaded rod used with Cinch Nut</td>
<td>CNX11-1 3/4 - 6 UNC-2A</td>
</tr>
<tr>
<td>(per ANSI/ASME B1.1)</td>
<td>CNX12-1 1 1/2 - 6 UNC-2A</td>
</tr>
</tbody>
</table>

Maximum permissible $F_u$ of the threaded rod used with the Cinch Nut $^1$

| Maximum permissible $F_u$ of the threaded rod used with the Cinch Nut $^1$ | 125,000 | 125,000 | 123,627 | 113,061 | 125,000 | 119,152 | 113,061 | 121,323 | 107,942 | 125,000 |
| Maximum allowable demand load on Cinch Nut $^2$ (pounds) where $F_u = 125,000$ psi | 5,177 | 9,204 | 14,067 | 16,942 | 28,187 | 29,283 | 42,337 | 54,190 | 51,093 | 82,835 |

Maximum allowable demand load on Cinch Nut $^2$ (pounds) where $F_u = 125,000$ psi

| Maximum allowable demand load on Cinch Nut $^2$ (pounds) where $F_u = 125,000$ psi | 5,177 | 9,204 | 14,223 | 18,731 | 28,187 | 32,834 | 44,415 | 55,832 | 60,106 | 82,835 |

Allowable load for Cinch Nut $^3$ (pounds)

| Allowable load for Cinch Nut $^3$ (pounds) | 5,177 | 9,204 | 14,223 | 18,731 | 28,187 | 32,834 | 44,415 | 55,832 | 60,106 | 82,835 |

Deflection at allowable load $^4, 6$, $\Delta A$ (inches)

| Deflection at allowable load $^4, 6$, $\Delta A$ (inches) | 0.0157 | 0.0217 | 0.0187 | 0.0224 | 0.0234 | 0.0241 | 0.0233 | 0.0287 | 0.0268 | 0.0361 |

Device average travel and seating increment $^5, 6$, $\Delta R$ (inches)

| Device average travel and seating increment $^5, 6$, $\Delta R$ (inches) | 0.029 | 0.048 | 0.0514 | 0.0578 | 0.0506 | 0.0549 | 0.0524 | 0.0754 | 0.0804 | 0.0717 |

For SI: 1 pound = 4.448 N, 1 inch = 25.4 mm, 1 lbf/in$^2$ = 6.895 kPa.

$^1$The specified minimum tensile strength, $F_u$, of the threaded rod used with the Cinch Nut must not exceed the tabulated $F_u$ values, except as noted in footnote 2.

$^2$When the demand load on the Cinch Nut does not exceed the tabulated loads in this row, the maximum permissible $F_u$ of the threaded rod is 125,000 (lbf/in$^2$).

$^3$Allowable load values are for Cinch Nuts only. The attached components (including anchors, tension rods, bearing plates, wood framing members, etc.) must be designed to resist design loads in accordance with the applicable code.

$^4$Values of deflection at allowable load are for the Cinch Nut devices only. They do not include movement due to bolt elongation, wood compression, etc.

$^5$The average travel and seating increment, $\Delta R$, is defined as the average of the movement required to cause incremental motion from a seated position and the opposite movement required to reseat the device after ratcheting.

$^6$The device average travel and seating increment, $\Delta R$, and deflection at allowable load, $\Delta A$, describe the total movement of the device at allowable load, $\Delta T$, and are additive. For design loads, $P_D$, less than the allowable load, $P_A$, the total movement of the device is calculated as follows: $\Delta T = \Delta R + \Delta A(P_D/P_A)$. 

For design loads, $P_D$, less than the allowable load, $P_A$, the total movement of the device is calculated as follows: $\Delta T = \Delta R + \Delta A(P_D/P_A)$. 

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### CINCH NUT DIMENSIONS (inches)

<table>
<thead>
<tr>
<th>DIMENSION DESIGNATION</th>
<th>CNX3</th>
<th>CNX4</th>
<th>CNX5</th>
<th>CNX6</th>
<th>CNX7</th>
<th>CNX8</th>
<th>CNX9</th>
<th>CNX10</th>
<th>CNX11</th>
<th>CNX12</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.551</td>
<td>1.695</td>
<td>1.861</td>
<td>2.016</td>
<td>2.164</td>
<td>2.325</td>
<td>2.498</td>
<td>2.666</td>
<td>2.805</td>
<td>3.092</td>
</tr>
<tr>
<td>B</td>
<td>0.854</td>
<td>0.868</td>
<td>0.881</td>
<td>1.015</td>
<td>1.150</td>
<td>1.288</td>
<td>1.430</td>
<td>1.555</td>
<td>1.703</td>
<td>1.828</td>
</tr>
<tr>
<td>D</td>
<td>0.625</td>
<td>0.625</td>
<td>0.625</td>
<td>0.625</td>
<td>0.625</td>
<td>0.625</td>
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<td>0.414</td>
</tr>
<tr>
<td>E</td>
<td>0.313</td>
<td>0.313</td>
<td>0.313</td>
<td>0.313</td>
<td>0.313</td>
<td>0.313</td>
<td>0.313</td>
<td>0.313</td>
<td>0.313</td>
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<tr>
<td>F</td>
<td>0.194</td>
<td>0.194</td>
<td>0.194</td>
<td>0.194</td>
<td>0.194</td>
<td>0.194</td>
<td>0.194</td>
<td>0.194</td>
<td>0.194</td>
<td>0.194</td>
</tr>
<tr>
<td>G</td>
<td>0.450</td>
<td>0.575</td>
<td>0.700</td>
<td>0.825</td>
<td>0.950</td>
<td>1.075</td>
<td>1.200</td>
<td>1.325</td>
<td>1.450</td>
<td>1.575</td>
</tr>
<tr>
<td>I</td>
<td>0.668</td>
<td>0.793</td>
<td>0.940</td>
<td>1.077</td>
<td>1.217</td>
<td>1.360</td>
<td>1.510</td>
<td>1.698</td>
<td>1.885</td>
<td>2.072</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm

**FIGURE 1—CINCH NUT DIMENSIONS**
FIGURE 2—CINCH NUT INSTALLATION DETAIL—PLATED SYSTEM
1.0 REPORT PURPOSE AND SCOPE

Purpose:
The purpose of this evaluation report supplement is to indicate that Cinch Nut™ Shrinkage Compensation Device: Models CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 and CNX12, described in ICC-ES evaluation report ESR-2190, has also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:
- 2020 City of Los Angeles Building Code (LABC)
- 2020 City of Los Angeles Residential Code (LARC)

2.0 CONCLUSIONS

The Cinch Nut™ Shrinkage Compensation Device: Models CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 and CNX12, described in Sections 2.0 through 7.0 of the evaluation report ESR-2190, complies with the LABC Chapter 23, and the LARC, and is subjected to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Cinch Nut™ Shrinkage Compensation Device: Models CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 and CNX12 described in this evaluation report supplement must comply with all the following conditions:

- All applicable sections in the evaluation report ESR-2190.
- The design, installation, conditions of use and identification of the Cinch Nut™ Shrinkage Compensation Devices are in accordance with the 2018 International Building Code® (IBC) provisions noted in the evaluation report ESR-2190.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued June 2020 and revised July 2020.
DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 05 23—Wood, Plastic, and Composite Fastenings

REPORT HOLDER:

MITEK® INC.

EVALUATION SUBJECT:

CINCH NUT™ SHRINKAGE COMPENSATION DEVICE: MODELS CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 AND CNX12

1.0 REPORT PURPOSE AND SCOPE

Purpose:
The purpose of this evaluation report supplement is to indicate that Cinch Nut™ Shrinkage Compensation Device: Models CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 and CNX12, described in ICC-ES evaluation report ESR-2190, has also been evaluated for compliance with Chapter 23 of the code noted below.

Applicable code edition:
- 2019 California Building Code (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 California Residential Code (CRC)

2.0 CONCLUSIONS

2.1 CBC:
The Cinch Nut™ Shrinkage Compensation Device: Models CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 and CNX12, described in Sections 2.0 through 7.0 of the evaluation report ESR-2190, complies with CBC Chapter 23, provided the design and installation are in accordance with the 2018 International Building Code® (IBC) provisions noted in the evaluation report and the additional requirements of the CBC Chapters 16, 17 and 23, as applicable.

Section 5.4 of the evaluation report must be revised to read as follows: When using the basic allowable stress design load combinations in accordance with CBC Section 1605.3.1, or the alternative allowable stress design load combinations in accordance with CBC Section 1605.3.2, allowable loads are not permitted to be increased for wind or earthquake loading.

2.1.1 OSHPD:
OSHPD requirements as indicated in the CBC are beyond the scope of this supplement.

2.1.2 DSA:
DSA requirements as indicated in the CBC are beyond the scope of this supplement.

2.2 CRC:
The Cinch Nut™ Shrinkage Compensation Device: Models CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 and CNX12, described in Sections 2.0 through 7.0 of the evaluation report ESR-2190, complies with the CRC Section R301.1.1.3, provided the design and installation are in accordance with the 2018 International Building Code® (IBC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued June 2020 and revised July 2020.
1.0 REPORT PURPOSE AND SCOPE

Purpose:
The purpose of this evaluation report supplement is to indicate that Cinch Nut™ Shrinkage Compensation Device: Models CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 and CNX12, described in ICC-ES evaluation report ESR-2190, has also been evaluated for compliance with the codes noted below.

Applicable code editions:
- 2020 and 2017 Florida Building Code—Building
- 2020 and 2017 Florida Building Code—Residential

2.0 CONCLUSIONS

The Cinch Nut™ Shrinkage Compensation Device: Models CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 and CNX12, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-2190, complies with the Florida Building Code—Building and the Florida Building Code—Residential, provided the design requirements are determined in accordance with the Florida Building Code—Building or the Florida Building Code—Residential, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-2190 for the 2018 and 2015 International Building Code® meet the requirements of the Florida Building Code—Building or the Florida Building Code—Residential, as applicable, with the following condition:

a) Use of the Cinch Nut™ in contact with preservative-treated and fire-retardant-treated wood is outside the scope of ESR-2190. Requirements for compliance with Section 2304.10.5 of the Florida Building Code—Building and Section R317.3 of the Florida Building Code—Residential must be as indicated in a current ICC-ES evaluation report issued to the chemical treatment manufacturer. If the evaluation report does not contain information on the adjustments, the chemical manufacturer must be contacted for this information.

Use of the Cinch Nut™ Shrinkage Compensation Device: Models CNX3, CNX4, CNX5, CNX6, CNX7, CNX8, CNX9, CNX10, CNX11 and CNX12 has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the Florida Building Code—Building and the Florida Building Code—Residential, with the following condition:

a) For connections subject to uplift, the connection must be designed for no less than 700 pounds (3114 N).

For products falling under Florida Rule 61G20-3, 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 evaluation report, reissued June 2020 and revised July 2020.