



Unlock the Path to ICC-ES Product Approval

Presented by

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Outline

- Intro – Justin Mann
- Overview
- Product Evaluation Process
 - Scope Development / Test Plan
 - Evaluation / Certification
 - Sampling / Testing
 - Follow-up / Inspection
- Closing Thoughts
- Q&A

Intro



Justin Mann

25 years in TIC industry

- * International Code Council (NTA, ES)
- * Intertek (Architectural Testing)

Industry Activities

- * ASTM (Standards Development)
- * Association engagement

Overview

What is product certification?

- Product certification is the process of evaluating and certifying that a certain product has passed qualification tests and quality assurance requirements, demonstrating conformance with governing regulations and/or specifications.
 - Certification / ISO 17065
 - Building code report / ESR
 - Listing / ESL
 - Testing / ISO 17025
 - Inspection / ISO 17020



Why go through the effort?

- Accredited third-party product certifications provide assurance to end-users that the product has been evaluated by an impartial organization for compliance with building codes, standards, and/or specifications.
- In the case of building codes, the Authority Having Jurisdiction (AHJ) is the building official, who decides whether or not to approve products for use in a building. A code report and/or listing helps them make this determination.

So many regulations and governing standards!

To name a few...

- IBC – International Building Code
- IRC – International Residential Code
- FBC and other state codes
- Miami-Dade County NOA
- ASTM specifications
- Job specifications

Who uses the certification?

- End Users
 - Building Officials
 - Building Departments
 - Architects
 - Engineers
 - Contractors
 - Specifiers
 - Homeowners
- Manufacturer
 - Marketing



Product Evaluation Process

Process

- Receive inquiry
- Develop scope of work
- Prepare test plan*
- Execute sampling / testing
- Conduct initial plant inspection
- Complete evaluation / certification
- Commence follow-up phase / inspections and renewals

Scope of Work

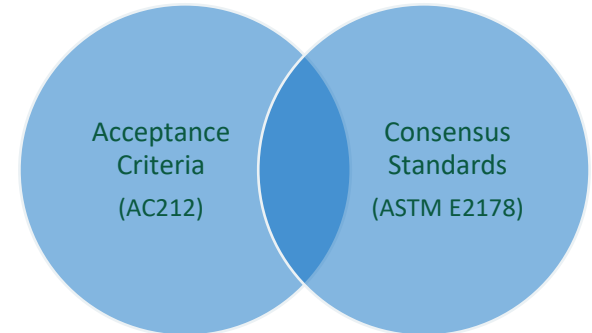
- Step 1 – Understand the product and manufacturing process
 - Material specifications
 - Physical specification
 - Manufacturing process
- Step 2 – Identify appropriate code provisions, based on where/how product is used
 - Combustible or noncombustible construction
 - Fire-resistance rated construction
 - Interior, exterior
 - Walls, roofs, floors
 - Below grade

Scope of Work (continued)

- Step 3 – Strategize the evaluation
 - It is more advantageous to start with a basic report and modify / increase scope later. Certifications can be revised at any time.
- Step 4 – Identify evaluation procedures
 - Existing Acceptance Criteria (AC)
 - New Acceptance Criteria (AC)
 - Standards / specifications

Acceptance Criteria vs. Consensus Standards

- Consensus standards (ASTM, UL, NFPA, ISO, etc.):
 - Developed through open, balanced, multi-stakeholder processes.
 - Define uniform test methods and performance metrics.
- ICC-ES Acceptance Criteria (AC):
 - Developed when no consensus standard fully covers a product or system.
 - Specify evaluation methods and pass/fail criteria tailored to that product.
 - Reviewed and approved through public hearings of the ICC-ES Evaluation Committee.
 - In many evaluations, both ACs and consensus standards are applied to demonstrate compliance.



Test Plan

- One of the most important steps – often skipped!
- Ensures that all parties are on board with the path forward, before spending time and money on testing that may not be needed or may not be able to be used.
- The test plan is a product-specific “roadmap to certification”, outlining steps A-Z.
- Considers worst-case scenarios to minimize testing while maximizing qualification.

Sampling

- Independent selection of products for testing.
- Must be representative of the standard manufactured product.
- Typically selected from manufacturing site / production line.
 - Sampling from warehouse may be permitted, if traceability exists.
- Sampled products are marked and shipped to lab for testing.
- A sampling report must be provided.
- Occasionally, an AC may allow the manufacturer to select products, which must still be representative of normal production.

Testing

- Structural performance / creep testing
- Impact resistance (hurricane, tornado)
- Air / Water / Structural
- Material properties
- Durability (weathering, freeze-thaw, salt spray, environmental)
- Fire (reaction to fire, fire resistance)
- Plumbing (fixtures and fittings)
- Field testing

Axial Compression

- ASTM E72



Racking Resistance

- ASTM E72
- ASTM E564



Creep Testing

- Decking / AC174, ASTM D7031
- Lumber / ASTM D6815
- Sandwich panels, SIPs /
ASTM C480
- Tensile creep of adhesives /
AC05, ASTM D2294



Air / Water / Structural – Test Wall

- ASTM E283 / E331 or E547 / E330
- AAMA 101 "NAFS" - fenestration
- AAMA 1701.2 / 1702.2 - doors
- ASTM D5206 - siding
- TAS 202 / 203

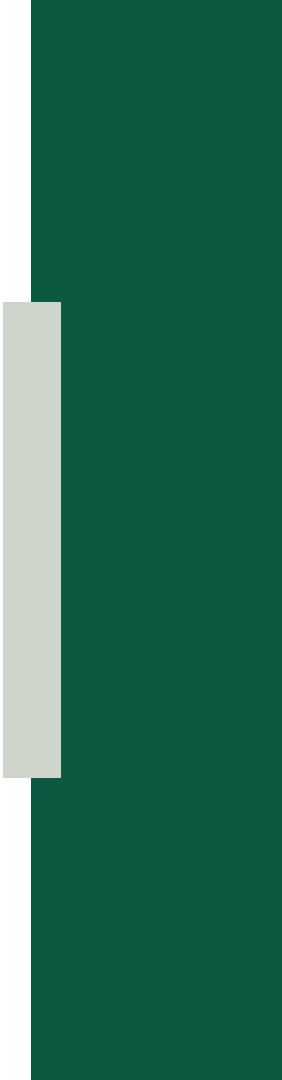


Air Cannon

for hurricane and tornado
impact resistance testing

- TAS 201
- ASTM E1886 / E1996
- ICC 500





Durability

- Accelerated weathering
 - Weatherometer for xenon arc / ASTM G155
 - QUV for UV resistance / ASTM G154
- UV box / ICC-ES AC38, AC48, AC71, AC382
- Salt spray corrosion testing / ASTM B117
- Environmental chambers for temperature and humidity exposure (as low as -95°F)
- Freeze/thaw cycles (e.g. ASTM C666)



Material Properties

- Instron universal test machine
 - Easily capable of 800+ standards
- Thermal resistance (R-value) / ASTM C518
- Water vapor transmission / ASTM E96
- Optical properties / color fade, haze, transmittance (using spectrophotometer)
- Slip Resistance / ASTM E303, F462, F1678, F1679; ANSI A137.1, A326.3, B101.3, etc.
- And much, much more!



Field Testing

ASTM E1105

ASTM E783

AAMA 501.2



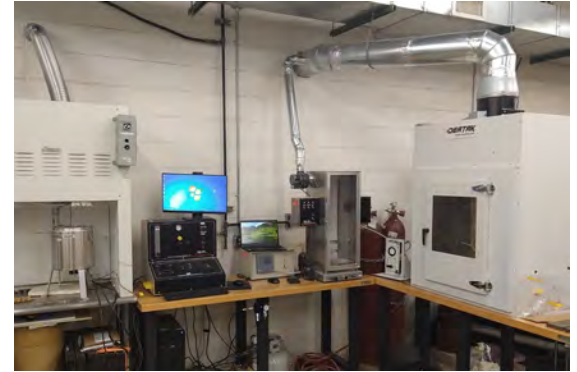
Benchtop Fire Tests

Rate of Burn / UL 94 (ASTM D635, D3801, D5048, D4804, D4986)

Smoke Development / ASTM D2843

Self- and Flash-Ignition / ASTM D1929

Noncombustibility / ASTM E136, ASTM E2652, ISO 1182, BS 476-4, AS 1530.1, IMO/FTP Code part 1



ISMA

Intermediate Scale Multistory
Apparatus

NFPA 285



Steiner Tunnel

ASTM E84

UL 723

Rate of Burn

Smoke Development



Roofing Classification

ASTM E108

UL 790

Class A, B, or C



Room Corner Burn

NFPA 286

UL 1715

CAN/ULC-S145

ISO 9705

AC377 Appendix X



Fire Resistance

ASTM E119

UL 263

ASTM E814

UL 1479

ULC-S101



Initial Plant Inspection

- Inspector visits manufacturing facility/ies to ensure that the manufacturer's quality system requirements are being followed.
- This ensures that products being produced on an ongoing basis are the same as the ones that were tested and evaluated.

Key Submittals for ICC-ES Evaluation

- Product Information
- Manufacturing Quality System
- Test Plan and Test Reports
- Sampling Documentation
- Installation Instructions
- Initial Plant Inspection Report
- Technical Evaluation Summary

Certification

- Assigned evaluator reviews all inputs to ensure that all certification requirements are addressed (sampling, testing, inspection, etc.).
- Once approved, the certification is listed publicly on ICC-ES's site.

- ESR – code report
 - IBC and IRC model codes
 - may include supplemental codes: states, WUI, energy, etc.
- ESL – listing
 - Published standards

Find Reports

Report Type

Report Number

Product Name

Product Type

Code Edition

Standard

Start typing and select a suggestion from the list to get accurate results.

10 entries per page

Report Number	Manufacturer	Product Name	Codes
ESR-1157	Sika Corporation – Roofing	SARNAFIL S327, G410, G410 SAM, SIKAPLAN FASTENED AND SIKAPLAN ADHERED SINGLE-PLY ROOFING SYSTEMS	<div style="display: flex; flex-wrap: wrap; gap: 5px;"> 06 09 12 15 18 21 24 CBC LABC </div>
ESR-1184	Carlisle Syntec Systems, A Division of Carlisle Construction Materials, LLC	CARLISLE BALLASTED SINGLE-PLY ROOFING SYSTEMS MEMBRANES— EPDM AND TPO	<div style="display: flex; flex-wrap: wrap; gap: 5px;"> 09 12 15 18 21 24 CBC OS </div>
ESR-1208	Star Lumber Canada Ltd.	Star Lumber, Black Hawk, and Green River Western Red Cedar Shakes and Shingles	<div style="display: flex; flex-wrap: wrap; gap: 5px;"> 06 09 12 15 18 21 </div>

ICC-ES Evaluation Report

ESR-5695

Issued June 2025

Revised September 2025

Subject to renewal June 2026.

This report also contains:

- [City of LA Supplement](#)

- [CA Supplement](#)

- [FL Supplement w/ HVHZ](#)

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DIVISION: 06 00 00— WOOD, PLASTICS AND COMPOSITES	REPORT HOLDER: MITEK® INC.	EVALUATION SUBJECT: MITEK CONCEALED CONNECTORS AND CONCEALED CONNECTOR WOOD SCREWS	
Section: 06 05 23— Wood, Plastic, and Composite Fastenings			

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018, 2015 and 2012 [International Building Code® \(IBC\)](#)
- 2024, 2021, 2018, 2015 and 2012 [International Residential Code® \(IRC\)](#)

Property evaluated:

- Structural

2.0 USES

The MiTek Concealed Connectors and Concealed Connector Wood Screws described in this report are used together for connecting wood framing members in accordance with Section 2304.10.4 of the 2024 and 2021 IBC (Section 2304.10.3 of the 2018 and 2015 IBC; Section 2304.9.3 of the 2012 IBC). The connectors and fasteners may also be used in structures regulated under the IRC when an engineered design is submitted to, and approved by, the code official in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 CCWS Concealed Connector Wood Screws:

MiTek CCWS Concealed Connector Wood Screws are manufactured using a cold-forming process and are heat-treated. The CCWS screws have a flat wafer head with a six-lobe recess that accepts a T25 bit, a self-drilling tip, and rolled threads spaced 10 threads per inch (0.393 thread per millimeter). MiTek CCWS screws are designed to be used exclusively with MiTek's CJHQ Concealed Joist Hanger and CPBQ Concealed Post Base described in this report and are packaged with the connectors. See [Table 1](#) for specifications and strengths of the CCWS screws and [Figure 1](#) for depictions of the CCWS screws.

3.2 CJHQ Concealed Joist Hanger:

The CJHQ Concealed Joist Hanger is designed as a face mount hanger for connecting wood joists to wood headers or posts. The hanger is cold-formed from No. 12 gage steel and the flanges are prepunched for installation of MiTek CCWS screws into the header or post. The body of the hanger is a knife plate prepunched in a mesh pattern for use with MiTek CCWS screws. See [Table 2](#) and [Figures 2](#) and [3](#) for product dimensions, fastener schedule, allowable loads, and typical installation details.

3.3 CPBQ Concealed Post Base:

The CPBQ Concealed Post Base is designed to secure wood posts to concrete or masonry foundations. The CPBQ consists of a knife plate cold-formed from No. 12 gage steel which is prepunched in a mesh pattern for use with MiTek CCWS screws and has two flanges for anchorage to concrete or masonry foundations. Depending upon the product size, the CPBQ Concealed Post Base may have one or two knife plates. The knife plate is supplied with a stand-off base which is cold-formed from No. 10 gage steel and two rectangular washers which are cold-formed from No. 7 gage steel. The CPBQ post base must be used with two 1/2-inch-diameter anchor bolts. See [Table 3](#) and [Figure 4](#) for product dimensions, fastener schedule, allowable loads, and typical installation details.

3.4 Materials:

3.4.1 Steel: CJHQ joist hangers are formed from ASTM A653 SS Grade 40 steel with a G185 zinc coating. CPBQ post bases are formed from ASTM A653 SS Grade 40 steel and consist of three parts: the knife plate, the stand-off, and two washers. The knife plate and stand-off have a G185 zinc coating complying with ASTM A653. In addition, the stand-off is powder-coated black. The CPBQ washers have a G90 zinc coating complying with ASTM A653. Minimum base metal thicknesses for the different material gages are shown below:

GAGE NO.	MINIMUM BASE METAL THICKNESS (in.)
12	0.090
10	0.129
7	0.171

For SI: 1 inch = 25.4 mm.

3.4.2 Wood: Wood members must be sawn lumber, structural glued laminated timber with a minimum assigned specific gravity, SG_{WOC} , of 0.50, or structural composite lumber (SCL) with a minimum equivalent specific gravity, SG_{EQ} , of 0.50, determined in accordance with the ICC-ES evaluation report on the SCL. Minimum reference strength requirements are shown in the footnotes to the tables in this report. Wood members must have a moisture content not exceeding 19 percent (16 percent for structural glued laminated timber and structural composite lumber products), except as noted in Section 4.1. Structural composite lumber must be addressed in, and used in accordance with, a current evaluation report.

3.4.3 Fasteners:

3.4.3.1 MiTek CCWS Concealed Connector Wood Screws: The wood screws used with the CJHQ and CPBQ connectors must be MiTek CCWS Concealed Connector Wood Screws, as described in this section and Section 3.1. The appropriate size of CCWS screws must be used, as indicated in the applicable tables of this report. CCWS screws are manufactured from carbon steel complying with the specifications in the manufacturer's quality documentation and are heat-treated. CCWS screws have a proprietary finish.

3.4.4 Anchor Bolts: At a minimum, anchor bolts must comply with ASTM A307 and must have a minimum bending yield strength of 45,000 psi (310 MPa). Anchor bolt diameters must be as specified in the applicable tables of this report.

3.4.5 Concrete and Masonry Construction: Materials and quality of concrete and masonry construction must comply with the applicable provisions of Chapter 19 and 21 of the IBC. The compressive strength of the concrete and masonry construction must be in accordance with the approved design and with applicable provisions of the building code.

4.0 DESIGN AND INSTALLATION

4.1 Design:

Allowable load capacities tabulated in this report apply exclusively to installation of the CJHQ and CPBQ concealed connectors with CCWS concealed connector wood screws. Design of other connections using CCWS screws and installation of CJHQ and CPBQ connectors with fasteners other than CCWS screws is outside the scope of this report. The tabulated loads are based on allowable stress design (ASD) and include load duration factors, C_p , corresponding with the applicable loads in accordance with Section 11.3.2 of the National Design Specification (NDS) for Wood Construction (Section 10.3.2 of the 2012 NDS for the 2012 IBC). No further increases are permitted for load durations other than those specified.

Tabulated allowable loads apply to connections in wood seasoned to a maximum moisture content of 19 percent (16 percent for engineered wood products) and where sustained temperatures are 100°F (37.8°C) or less. When connectors are installed in wood having a moisture content greater than 19 percent (16 percent for engineered wood products), or where the in-service moisture content is expected to exceed this value, the allowable loads must be adjusted by the applicable wet service factor, C_w , as specified in the NDS.

Follow-up Inspections and Renewals

- As required, follow-up inspections are conducted at the manufacturing facility/ies for the life of the certification.
- The inspector verifies conformance of the plant quality system with the quality system documentation on file with ICC-ES.
- Renewal fees are assessed for a one- or two-year renewal period, as determined by report holder.

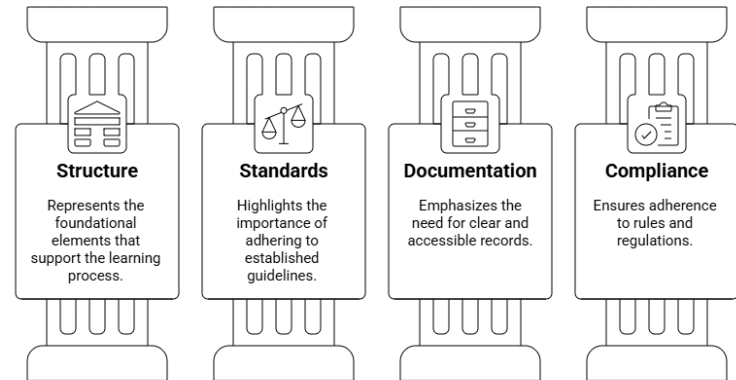
Closing Thoughts

Tips and Tricks

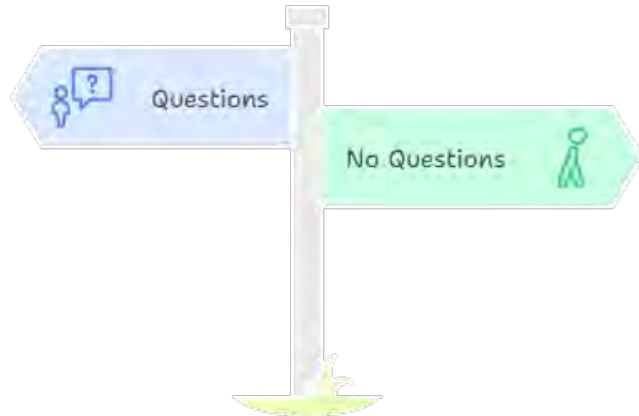
- Allow plenty of time
 - Engage certification body early
- Don't skip the test plan
 - Obtain buy-in from all parties
- Avoid product / process changes during project
- Don't go it alone
 - Partner with your certification body

Connecting the Dots

- ICC-ES's structure and role provide the compliance foundation.
- Acceptance Criteria and consensus standards form complementary evaluation tools.
- Comprehensive documentation ensures credible, reproducible evaluations.
- Resulting ESRs support reliable specification and code.



Q&A



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