

ICC-ES Evaluation Report

ESR-5278

Reissued October 2024


This report also contains:

- City of LA Supplement
- CA Supplement
- FL Supplement

Subject to renewal October 2026

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DIVISION: 03 00 00— CONCRETE Section: 03 16 00— Concrete Anchors DIVISION: 09 00 00— FINISHES Section: 09 22 16.23— Fasteners	REPORT HOLDER: INTERNATIONAL FASTENERS, INC.	EVALUATION SUBJECT: DAGGERZ™ PIN AND 90° CEILING CLIP ASSEMBLY	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

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

Property evaluated:

- Structural

2.0 USES

The Daggerz™ Pin and 90° Ceiling Clip Assembly is used to attach wire for suspended ceilings to the supporting normalweight-concrete or lightweight-concrete-filled-steel-deck structure above. The assembly is used as an alternative to cast-in-place concrete anchors described in IBC Section 1901.3 (2012 IBC Section 1908); and may also be used in structures regulated under the IRC where an engineered design is submitted in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 Ceiling Clip Assembly:

The Daggerz™ Pin and 90° Ceiling Clip Assembly consists of a Daggerz™ Pin power-actuated fastener (PAF) with a 90-degree steel clip assembled with the pin at the manufacturing facility. See [Table 1](#) for assembly description and [Figure 1](#) for a depiction of the assembly.

3.1.1 Daggerz™ Pin: The Daggerz™ Pin is manufactured from steel complying with ASTM A510, Grade 1060, and austempered to a Rockwell “C” core hardness of 52 to 56. The pin has a zinc-plated finish and includes a PVC detent flute. See [Table 1](#) for pin details and [Figure 1](#) for head marking.

3.1.2 Ceiling Clip: The clip has a 90-degree angle between the legs of the clips, with a 90-degree eyelet offset in the fastened leg. Each clip is manufactured from ³/₄-inch-wide (19 mm), No. 14 gage [0.071-inch (1.80 mm) base-metal thickness] steel strips conforming to cold-rolled low carbon steel SAE1010. The fastened leg of the clip is 1¹/₄ inches long (32 mm) and the opposite leg is ³/₄ inch long (19.1 mm). The ³/₄-inch-long (19 mm) leg has a hole with a nominal diameter of 0.275-inch (7.0 mm) through which the ceiling wire is attached.

3.2 Substrate Materials:

3.2.1 Concrete: Normalweight and sand-lightweight concrete must comply with IBC Chapter 19 or IRC Section R402.2, as applicable. The minimum concrete compressive strength at the time of fastener installation must be as noted in [Tables 2](#) and [3](#), as applicable.

3.2.2 Steel Deck Panels: Steel deck panels must conform to a code-referenced material standard, with the minimum thickness and minimum yield strength and specified tensile strength noted in [Table 3](#) and [Figure 2](#).

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 Allowable Loads: The allowable tension, shear and 45-degree-angle loads for the assembly installed in normalweight concrete are provided in [Table 2](#). The allowable tension, shear and 45-degree-angle loads for the assembly installed in concrete filled steel deck panels are provided in [Table 3](#).

The most critical applied loads, excluding seismic load effects, resulting from the load combinations in Section 2.4 of ASCE 7-16/S1 (referenced in IBC Section 1605.1) or 2021 IBC Section 1605.2 (Section 1605.3.1 or 1605.3.2 of the 2018, 2015, and 2012 IBC) must not exceed the allowable loads given in this section. When the assembly is subjected to seismic loads, see Section 4.1.4 for additional requirements. The stress increases and load reductions described in 2021 IBC Section 1605.2 (2018, 2015 and 2012 IBC Section 1605.3) are not allowed.

Allowable loads described in this report apply to the connection of the assembly to the base material only. Design of the connection of the attached material to the clip must comply with the applicable requirements of the IBC.

4.1.2 Seismic Considerations: When subjected to seismic loads, the Daggerz™ Pin and 90° Ceiling Clip Assembly may be used as follows:

1. The assembly may be used for attachment of nonstructural components listed in Section 13.1.4 of ASCE 7, which are exempt from the requirements of ASCE 7.
2. The assembly installed in concrete may be used to support acoustical tile or lay-in panel suspended ceiling systems, distributed systems and distribution systems where the service load on any individual assembly does not exceed the lesser of 90 lbf (400 N) or the published allowable load in [Tables 2](#) and [3](#), as applicable.

4.2 Installation:

4.2.1 General: The Daggerz™ Pin and 90° Ceiling Clip Assembly must be installed in accordance with this report and the International Fasteners, Inc. published installation instructions. A copy of these instructions must be available on the jobsite at all times during installation.

A low-velocity, powder-actuated fastening tool, recommended by International Fasteners, Inc.'s, must be used to install the fasteners.

4.2.2 Fastening to Concrete: The assemblies must not be installed until the concrete has reached the applicable compressive strength addressed in [Table 2](#). The spacing between the pins must be a minimum of 4 inches (100 mm) and the edge distance must be a minimum of 3.2 inches (80 mm).

4.2.3 Fastening to Concrete-filled Steel Deck Panels: The assemblies must not be installed until the concrete has reached the applicable compressive strength addressed in [Table 3](#). Minimum assembly spacing and distance to the deck panel flute edge are addressed in [Table 3](#) and [Figure 2](#).

5.0 CONDITIONS OF USE:

The Daggerz™ Pin and 90° Ceiling Clip Assembly described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** The Daggerz™ Pin and 90° Ceiling Clip Assembly is manufactured and identified in accordance with this report.
- 5.2** The Daggerz™ Pin and 90° Ceiling Clip Assembly installation must comply with this report and the International Fasteners, Inc.'s published installation instructions. In the event of a conflict between this report and the International Fasteners, Inc.'s published installation instructions, the more restrictive requirements govern.
- 5.3** Calculations must demonstrate that the actual loads are less than the allowable loads described in this report. The construction documents prepared or reviewed by a registered design professional, where required by the statutes of the jurisdiction in which the project is to be constructed specifying the Daggerz™ Pin and 90° Ceiling Clip Assembly, must indicate compliance with this evaluation report and applicable

codes and must be submitted to the code official for approval.

- 5.4 Refer to Section 4.1.2 for seismic considerations.
- 5.5 The use of the Daggerz™ Pin and 90° Ceiling Clip Assembly is limited to dry, interior locations, which include exterior walls which are protected by an exterior wall envelope.
- 5.6 The use of the Daggerz™ Pin and 90° Ceiling Clip Assembly is limited to installation in uncracked concrete. Cracking occurs when $f_t > f_r$ due to service loads or deformations.
- 5.7 The Daggerz™ Pin and 90° Ceiling Clip Assembly are manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Power-actuated Fasteners Driven into Concrete, Steel and Masonry Elements \(AC70\)](#) dated December 2019 (editorially revised January 2021).

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5278) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.
- 7.2 In addition, the pins are imprinted with “DZ” on the head as shown in [Figure 1](#). Packages of the Daggerz™ Pin and 90° Ceiling Clip Assembly are labeled with the product designation and pin description.
- 7.3 The report holder’s contact information is the following:

INTERNATIONAL FASTENERS, INC.
1341 MASSARO BOULEVARD
TAMPA, FLORIDA 33619
(888) 241-0203
www.daggerz.com

TABLE 1—DAGGERZ™ PIN AND 90° CEILING CLIP ASSEMBLY

PRODUCT DESIGNATION	CLIP DESCRIPTION	PIN SHANK STYLE	PIN SHANK DIAMETER (in.)	PIN HEAD DIAMETER (in.)	PIN MAXIMUM POINT LENGTH ¹ (inch)	PIN SHANK LENGTH (in.)	MIN. EFFECTIVE PIN SHANK LENGTH ² (inch)	PIN COATING
PTSC90P1104	0.074-inch thick, 90° clip angle with 0.275-inch diameter hole	Smooth	0.145	0.295	0.280	1 ¹ / ₄	1.259	Zinc

For **SI**: 1 inch = 25.4 mm.

¹Maximum point length is the maximum specified length from the tip of the fastener to the location where the diameter of the shank becomes constant.

²Minimum effective shank length is the minimum specified length from the underside of the fastener head to the tip of the fastener. The minimum effective shank length must equal or exceed the sum of the thickness of the attached material and the minimum embedment depth shown in [Table 2](#) or [Table 3](#), as applicable.

TABLE 2—ALLOWABLE LOADS FOR DAGGERZ™ PIN AND 90° CEILING CLIP ASSEMBLY INSTALLED IN NORMAL-WEIGHT CONCRETE^{1,2,3}

PRODUCT DESIGNATION	EMBEDMENT DEPTH (in.)	ALLOWABLE LOADS (lbf)		
Concrete Compression Strength:		4,000 psi		
Load Direction:		Tension	Shear	45-Degree
PTSC90P1104	1	92	208	130

For **SI**: 1 inch = 25.4 mm; 1 lbf = 4.45 N; 1 psi = 6.89 kPa.

¹Fasteners must not be driven until the concrete has reached the specified compressive strength.

²Concrete thickness at the point of penetration must be a minimum of three times the embedment depth.

³The fasteners listed in the table above may be used for static load conditions and for the seismic load conditions described in Section 4.1.2, as applicable. The tabulated allowable loads apply to static load conditions. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.2, Item 2.

TABLE 3—ALLOWABLE LOADS FOR DAGGERZ™ PIN AND 90° CEILING CLIP ASSEMBLY INSTALLED INTO STEEL DECK FILLED WITH SAND-LIGHTWEIGHT CONCRETE THAT HAS A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI^{1,2,3}

PRODUCT DESIGNATION	NOMINAL SHANK DIAMETER (inch)	SHANK DESCRIPTION	MINIMUM TOPPING THICKNESS (inches)	ALLOWABLE LOADS (lbf)				
Deck Type:				3-INCH DEEP W TYPE STEEL DECK ²				
Fastener Location:				Upper Flute		Lower Flute		
Load Direction:				Tension	Shear	Tension	Shear	45-Degree
PTSC90P1104	0.145	Smooth	2 ¹ / ₄	157	192	93	181	141

For **SI**: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 psi = 6.895 kPa.

¹Fasteners must not be driven until the concrete has reached the specified compressive strength.

²The W type steel deck must have a minimum base material thickness of 0.035 inch and must conform to the profile requirements as shown in [Figure 2](#). The steel deck must have a minimum yield strength, F_y , of 50 ksi and a minimum tensile strength of 65 ksi. For the upper flute, the fastener edge distance must be a minimum 1 inch; the fastener spacing along the length of the steel deck panel must be a minimum of 4 inches. For the lower flute, the fastener edge distance must be a minimum 1 inch to the adjacent long edge of the flute; the fastener spacing along the length of the steel deck panel must be a minimum 4 inches.

³The fasteners listed in the table above may be used for static load conditions and for the seismic load conditions described in Section 4.1.2, as applicable. The tabulated allowable loads apply to static load conditions. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.2, Item 2.



FIGURE 1—DAGGERZ[™] PIN AND 90° CEILING CLIP ASSEMBLY AND PIN HEAD MARKING

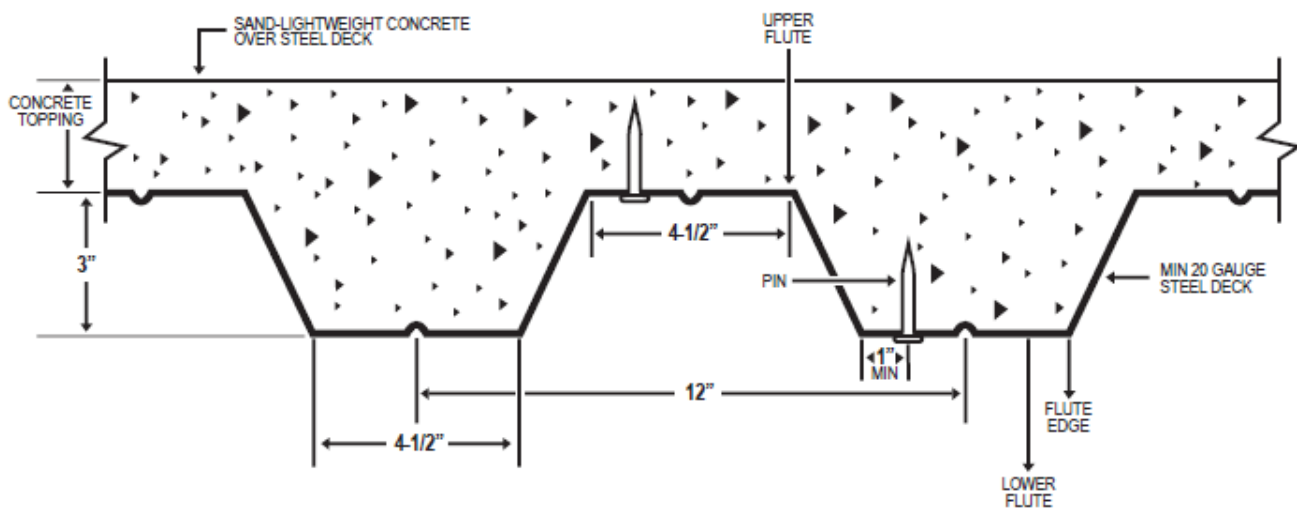


FIGURE 2—FASTENER INSTALLATION LOCATION IN 2 1/4 INCH TOPPING THICKNESS (SAND-LIGHTWEIGHT CONCRETE) WITH 3-INCH DEEP W DECK PROFILE

DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 09 00 00—FINISHES
Section: 09 22 16.23—Fasteners

REPORT HOLDER:

INTERNATIONAL FASTENERS, INC.

EVALUATION SUBJECT:

DAGGERZ™ PIN AND 90° CEILING CLIP ASSEMBLY

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the Daggerz™ Pin and 90° Ceiling Clip Assembly, described in ICC-ES evaluation report [ESR-5278](#), have 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:

- 2023 City of Los Angeles Building Code ([LABC](#))
- 2023 City of Los Angeles Residential Code ([LARC](#))

2.0 CONCLUSIONS

The Daggerz™ Pin and 90° Ceiling Clip Assembly, described in Sections 2.0 through 7.0 of the evaluation report [ESR-5278](#), comply with the LABC Chapter 19, 22 and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Daggerz™ Pin and 90° Ceiling Clip Assembly described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-5278](#).
- The design, installation, conditions of use and identification of the Daggerz™ Pin and 90° Ceiling Clip Assembly are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-5278](#).
- 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.
- The allowable load values listed in the evaluation report are for the connection of the Daggerz™ Pin and 90° Ceiling Clip Assembly to normal-weight concrete and lightweight concrete over metal decks only. The connection between the Daggerz™ Pin and 90° Ceiling Clip Assembly, as applicable, and the connected members must be checked for capacity (which may govern).

This supplement expires concurrently with the evaluation report, reissued October 2024.

ICC-ES Evaluation Report

ESR-5278 CA Supplement

Reissued October 2024

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DIVISION: 03 00 00—CONCRETE

Section: 03 16 00—Concrete Anchors

DIVISION: 09 00 00—FINISHES

Section: 09 22 16.23—Fasteners

REPORT HOLDER:

INTERNATIONAL FASTENERS, INC.

EVALUATION SUBJECT:

DAGGERZ™ PIN AND 90° CEILING CLIP ASSEMBLY

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Daggerz™ Pin and 90° Ceiling Clip Assembly, described in ICC-ES evaluation report ESR-5278, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2022 California Building Code (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2022 California Residential Code (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Daggerz™ Pin and 90° Ceiling Clip Assembly, described in Sections 2.0 through 7.0 of the evaluation report ESR-5278, comply with CBC Chapters 19 and 22, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional and inspection requirements of CBC Chapters 16 and 17, as applicable.

2.1.1 OSHPD:

The Daggerz™ Pin and 90° Ceiling Clip Assembly, described in Sections 2.0 through 7.0 of the evaluation report ESR-5278, comply with CBC Chapters 19 and 22 with applicable amendments [OSHPD 1R, 2, 3 and 5], and Chapters 19A and 22A [OSHPD 1 & 4], provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements in Sections 2.1.1.1 and 2.1.1.2 of this supplement:

2.1.1.1 Verification Test Requirements: The installation verification test loads, frequency, and acceptance criteria shall be in accordance with Section 1901.3.4 [OSHPD 1R, 2B and 5] or 1910A.5 [OSHPD 1 & 4] of the CBC, as applicable.

2.1.1.2 Conditions of Use:

1. Power-actuated fastener use in seismic shear applications shall be in accordance with Section 1901.3.1 [OSHPD 1R, 2 & 5] or 1617A.1.20 [OSHPD 1 & 4].

2.1.2 DSA:

The Daggerz™ Pin and 90° Ceiling Clip Assembly, described in Sections 2.0 through 7.0 of the evaluation report ESR-5278, comply with CBC Chapters 19 and 21 with applicable amendments [DSA-SS/CC], and Chapters 19A and 22A [DSA-SS],

provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements in Sections 2.1.2.1 and 2.1.2.2 of this supplement:

2.1.2.1 Verification Test Requirements: The installation verification test loads, frequency, and acceptance criteria shall be in accordance with Section 1909.2.7 [DSA-SS/CC] and 1910A.5 [DSA-SS] of the CBC, as applicable.

2.1.2.2 Conditions of Use:

1. Power-actuated fastener use in seismic shear applications shall be in accordance with Section 1617A.1.20 [DSA-SS].

2.2 CRC:

The Daggerz™ Pin and 90° Ceiling Clip Assembly, described in Sections 2.0 through 7.0 of the evaluation report ESR-5278, comply with CRC Section R301.1.3, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16 and 17.

This supplement expires concurrently with the evaluation report, reissued October 2024.

ICC-ES Evaluation Report

ESR-5278 FL Supplement

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DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 09 00 00—FINISHES
Section: 09 22 16.23—Fasteners

REPORT HOLDER:

INTERNATIONAL FASTENERS, INC.

EVALUATION SUBJECT:

DAGGERZ™ PIN AND 90° CEILING CLIP ASSEMBLY

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Daggerz™ Pin and 90° Ceiling Clip Assembly, described in ICC-ES evaluation report ESR-5278, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 Florida Building Code—Building
- 2023 Florida Building Code—Residential

2.0 CONCLUSIONS

The Daggerz™ Pin and 90° Ceiling Clip Assembly, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-5278, comply with the *Florida Building Code—Building* and *Florida Building Code—Residential*. The design requirements must be 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-5278 for the 2021 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Daggerz™ Pin and 90° Ceiling Clip Assembly has also been found in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, with the following conditions:

- The Daggerz™ Pin and 90° Ceiling Clip Assembly shall not be used in wood blocking attachment in accordance with *Florida Building Code—Building* Section 2330.1.10.
- The Daggerz™ Pin and 90° Ceiling Clip Assembly has not been evaluated for use as a cast-in-place anchor for compliance with the High-Velocity Hurricane Zone provisions, and this use is outside the scope of this evaluation report.

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).

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