ICC-ES Evaluation Report

ESR-3135

Reissued May 2024

This report also contains:

- LABC Supplement

Subject to renewal May 2025

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DIVISION: 05 00 00—METALS Section: 05 05 23—Metal Fastenings DIVISION: 09 00 00—FINISHES Section: 09 22 16.23—Fasteners	REPORT HOLDER: DOC'S INDUSTRIES, INC.	EVALUATION SUBJECT: I-LAG™ BRAND EYE LAG SCREWS	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015, 2012, and 2009 *International Building Code®* (IBC)
- 2018, 2015, 2012, and 2009 *International Residential Code®* (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

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

For evaluation for compliance with codes adopted by *Los Angeles Department of Building and Safety* (LADBS), see ESR-3135 LABC and LARC Supplement.

Property evaluated:

- Structural

2.0 USES

I-Lag Brand eye lag screws are used to provide a means of attaching steel wire to the underside of unfilled steel deck for installation of suspended ceiling systems complying with IBC Section 808.1. The fasteners may be used where an engineered design is submitted in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 General:

I-Lag Brand screws are self-drilling tapping screws. The screws have a self-drilling point and a self-tapping threaded shank below a washer-like collar. The threaded portion is nominally $^1/_4$ inch in diameter with 14 threads per inch. Above the collar, the smooth, straight shank transitions to a flattened portion with an eye for attaching the ceiling wire. See Figure 1. Recognized I-Lag Brand screws and their dimensions are listed in Table 1.

3.2 Screw Material:

The I-Lag Brand screws are manufactured from carbon steel wire complying with ASTM A510, Grade 1022, that is heat-treated to obtain a Rockwell C case hardness of 50 to 56 and a Rockwell C core hardness of 30 to 40. The screws are electro-galvanized in accordance with the report holder's specifications.

3.3 Base Material:

The I-Lag Brand screws are installed into cold-formed steel deck panels, which must have a minimum specified tensile strength of 45 ksi (310 MPa). The deck panels must have a minimum rib (flute) width of $1^1/_2$ inches (38 mm) and a thickness within the range addressed in Table 3.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The available tension loads shown in Table 3 are based on the screw strength and pull-out capacity of the screws. Minimum base-metal thickness and material strength requirements for the steel supports are also given in Table 3. Capacity of the ceiling wires used with the eye lag fasteners must be considered in the connection design.

4.2 Installation:

The I-Lag Brand screws must be installed in accordance with this report and the manufacturer's published installation instructions. A copy of these instructions must be available on the jobsite at all times during installation.

The screws and ceiling wire must be installed vertically to ensure that the tension load is applied along the axis of the screw. The screws must be installed perpendicular to the supporting steel deck material, through the upper or lower flute, using a screw driving tool. When using a screw-driving pole tool recommended by the manufacturer, the installation speed must not exceed 200 rpm. The I-Lag screws may also be installed with a variable-speed drill with a maximum speed of 1,900 rpm, by using a special driver provided by the report holder.

Screws must be spaced a minimum of $^3/_4$ inch (19.1 mm) on center along the length of the deck panel, and must be installed a minimum of $^3/_4$ inch (19.1 mm) from the deck web. After installation, a minimum of three threads must protrude through the steel deck panel.

Ceiling wire shall comply with and be installed in accordance with ASTM C636, referenced in IBC Section 808.1.1.1.

5.0 CONDITIONS OF USE:

The I-Lag Brand screws 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 fasteners are manufactured and identified in accordance with this report.

5.2 Fastener installation complies with this report and the manufacturer's published installation instructions. In the event of conflict between this report and the published instructions, this report governs.

5.3 Available tension loads are as noted in Table 3. The stress increases and load reductions described in Section 1605.3.2 of the IBC are not allowed. No adjustments for duration of load are allowed.

5.4 Use of the screws to attach bracing wire to the supports is outside the scope of this report.

5.5 The allowable loads noted in Section 4.1 apply to the fasteners and their connection to the steel only. Adequacy of the steel deck to support the suspended loads must be justified to the satisfaction of the code official.

5.6 Calculations demonstrating that the applied loads are less than the allowable loads described in this report must be submitted to the code official for approval. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.7 Use of the fasteners is limited to dry, interior locations.

5.8 The fasteners 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 Self-drilling Tapping Screws Used to Attach Miscellaneous Building Materials to Steel Base Material (AC500), dated December 2017.

7.0 IDENTIFICATION

7.1 The I-Lag Brand screws are embossed with four I's radiating from the shank on the top portion of the collar as shown in Figure 1. The packaging is labeled with the fastener type, part number, report holder name (Doc's Industries, Inc.) and evaluation report number (ESR-3135).

7.2 The report holder's contact information is the following:

DOC'S INDUSTRIES, INC.
4121 GUARDIAN STREET
SIMI VALLEY, CALIFORNIA 93063
(805) 583-9911
www.docsindustries.com

TABLE 1—I-LAG BRAND EYE LAG SCREWS

FASTENER TYPE	NOMINAL FASTENER SIZE (dia-tpi)	NOMINAL DIAMETER (in.)	LENGTH FROM UNDERSIDE OF COLLAR TO TIP (in.)	FASTENER "HEAD" LENGTH[1] (in.)	EYE DIAMETER (in.)	COLLAR DIAMETER AND THICKNESS (in.)
750 SD	1/4-14	0.250	3/4	1 1/4	0.18	0.5 by 0.07
175 SD	1/4-14	0.250	1 15/16	1 1/4	0.18	0.5 by 0.07

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

[1]Length from the underside of the collar to edge of the driving end of the fastener.

TABLE 2 — I-LAG™ BRAND EYE LAG SCREW FASTENER SHEAR AND TENSION STRENGTHS (lbf)

FASTENER TYPE	NOMINAL FASTENER SIZE	NOMINAL STRENGTH		ALLOWABLE STRENGTH (ASD)		DESIGN STRENGTH (LRFD)	
		Tension, P_{ts}	Shear, P_{ss}	Tension, (P_{ts}/Ω)	Shear, (P_{ss}/Ω)	Tension, (ΦP_{ts})	Shear, (ΦP_{ss})
750SD	1/4-14	1560	2527	520	872	780	1263
175SD	1/4-14	1560	2527	520	842	780	1263

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.4 N.

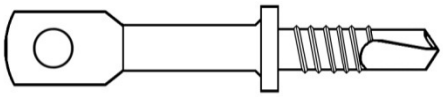
TABLE 3 —AVAILABLE TENSION LOADS FOR I-LAG™ BRAND EYE LAG SCREWS INSTALLED IN STEEL DECK PANELS (lbf)[1,2]

FASTENER TYPE	MINIMUM DESIGN BASE METAL THICKNESS (inch)			
	0.030	**0.036**	**0.047**	**0.062**
ALLOWABLE STRENGTH (ASD)				
750 SD 175 SD	82	125	176	229
DESIGN STRENGTH (LRFD)				
750 SD 175 SD	131	201	281	366

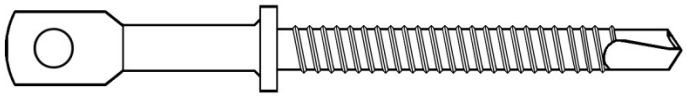
For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.4 N, 1 ksi = 6.895 MPa.

[1]The tabulated allowable load values are for the screws only, based on fastener strength and pullout capacity. Ceiling wire capacity is outside the scope of this report. Deck capacity is also outside the scope of this report.
[2]Values are based on installation into steel having a minimum tensile strength, F_u, of 45 ksi.

COLLAR MARKING



750 SD



175 SD

FIGURE 1—I-LAG BRAND EYE LAG SCREWS

DIVISION: 05 00 00—METALS
Section: 05 05 23—Metal Fastenings

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

REPORT HOLDER:

DOC'S INDUSTRIES, INC.

EVALUATION SUBJECT:

I-LAG™ BRAND EYE LAG SCREWS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that I-Lag Brand eye lag screws, described in ICC-ES evaluation report ESR-3135, 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:

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The I-Lag Brand eye lag screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-3135, comply with the LABC Chapters 8 and 22, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The I-Lag Brand eye lag screws described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-3135.
- The design, installation, conditions of use and identification of the I-Lag Brand eye lag screws are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report ESR-3135.
- 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 May 2024.

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