



DIVISION OF THE STATE ARCHITECT  
OFFICE OF REGULATION SERVICES

SPECIAL PROJECTS SECTION

**PRODUCT ACCEPTANCE NUMBER:** PA-079

**PRODUCT TYPE:** Connector for Suspended Ceiling System Hanger & Splay Wires

**ACCEPTANCE DATE:** March 12, 1998

**COMPANY NAME:** Doc's Marketing Corporation  
5158 Goldman Avenue, Unit A  
Moorpark, CA 93021

**PRODUCT NAME:** I-Lag™ Brand Eye Lag Screws

**CODE REFERENCES:** 1995 Title 24, Part 2, Section 1630A.2, Section 2501A,  
DSA IR 47-4

**DISCUSSION:**

I-Lag Brand Eye Lag Screws are intended for use as suspended ceiling fasteners. Three screw types, 750 SD, 150 SD and 150 WS, are fabricated from 1018 steel. The I-Lag fasteners are acceptable for use on public school, state-owned or state-leased essential services buildings and California Community College projects. The acceptance has been based on a review of test data, ICBO Evaluation Service, Inc. Evaluation Report ER-5367, and the manufacturer's quality control procedures and manual.

The fasteners shall be identified by one of two methods as shown on attached sheet.

The fasteners may be installed in wood, steel or light-gauge steel framing members. In steel framing, the fasteners shall protrude at least three threads beyond the face of the member, while in wood, the screws shall be fully embedded. See the ICBO ER-5367 for information pertaining to methods of installation.

The fasteners consist of a threaded portion below a 1/2 inch diameter washer and a flattened eyelet portion above the washer. The shank below the washer is 0.19 inch diameter and is increased to 0.21 inches above the washer. All threads are fabricated in accordance with the Society of Automobile Engineers, Inc. Standard SAE J78, Revised August 1996.

The 750 SD fastener is a 2" long self-tapping self-drilling screw intended for use into metal framing. The 150 SP fastener is a 2-3/4" long sharp point screw intended for installation into wood or metal framing. The 750 SD and 150 SP fasteners are heat treated for hardness and plated with zinc type-II yellow chromate.

The 150 WS is a sharp point wood screw with the same dimensions and threads as the 150 SP. The 150 WS is not heat treated and is either zinc-type I plated (silver) or is not plated (dull gray).

I-Lag Brand Eye Lag Screws are subject to the following limitations:

1. Installation of hanger and splay wires shall conform with Section 2501A.5, Part 2, Title 24, California Code of Regulations (CCR).

2. Allowable Tension Loads shall be as indicated in the following table:

Fastener	Direction of Applied Load on Fastener <sup>1</sup>	Allowable Tension Loads in Metal Framing, lbs. <sup>2,5</sup>				Allowable Tension and Shear Loads in Wood Framing, lbs. <sup>2,4</sup>
		16 ga.	18 ga.	20 ga.	22 ga. <sup>3</sup>	
750 SD	Tension	340	250	170	135	
	45°	340	250	170	135	
	Tension				180	245
150 SD	45°				180	155
	Shear					75
	Tension					270
150 WS	45°					140
	Shear					75

**Footnotes:**

- 1) See attached sheet for direction of load applied on fastener.
- 2) A factor of safety of 2-1/2 for steel and 4 for wood has been applied to allowable loads.
- 3) Use of metal deck lighter than 20 ga. requires compliance with Section 2204A.2, Title 24, Part 2, CCR.
- 4) Wood material values are based on a specific gravity of 0.46 and a minimum thickness of 1-1/2".
- 5) For metal deck 20 ga. or lighter, the maximum weight of ceiling system shall be limited to 2.5 psf. For 18 ga. metal deck, the maximum weight of ceiling system shall be limited to 4 psf. For 16 ga. metal deck, the maximum weight of ceiling system shall be limited to 6 psf.

**3. Quality Control Testing of Installation**

- a) For vertical hanger wires, one out of ten wires must be field tested for 200 lbs. tension.
- b) For diagonal splay wires, one out of two wires must be field tested to two times the allowable 45° tension value listed in Item 2 in the direction of the diagonal.
- c) All tension test shall be performed by an LEA approved testing agency and reports shall be sent to the Inspector of Record for the project. Test reports shall list testing method, metal deck gauge, number of tests performed, and physical condition of screws and metal deck after testing. Permanent set or displacement of screw after testing shall be considered failure.
- d) Alternative Testing Requirements for Plant Fabricated Relocatable Buildings:

Where suspended ceiling systems are installed into metal joist roof framing, the testing requirements may be relaxed due to the consistency in fabrication, quality control procedures and inspection services. These modified testing requirements are dependent upon the consistency of the test results obtained by the In-Plant Inspector of Record. This alternate procedure will need to be followed for each new Inspector as follows:

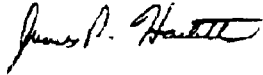
The inspection may be performed by the In-Plant Inspector of Record and need not be performed by an LEA testing agency. The first ten buildings shall be tested and reported in accordance with Items 3a) through 3c) above. As long as no failures occur, then the procedure may be modified as follows for all subsequent buildings inspected by that inspector:

- Tension test two randomly selected vertical hanger wires to 200 lbs. at each building module.
- Tension test two randomly selected diagonal splay wires at each building module to two times the allowable 45° tension value listed in Item 2 in the direction of the diagonal.
- If any fastener fails, all fasteners shall be tested for the entire building. Testing shall then revert back to the original procedure of items 3a) through 3c) for 10 consecutive buildings. If no additional failures occur, then the alternate procedure may resume. If additional failures do occur, then testing will be required on all anchors until authorized by DSA. Successful results shall be indicated on the Final Verified Report. Deficient test results shall be reported to DSA per Item 3c) above.

March 12, 1998

Changes to the product without DSA concurrence will void this acceptance. The acceptance of this product is contingent on continued acceptable performance and is subject to re-examination in two years.

If you have any questions regarding this product, please contact me at (916) 327-9699.



James P. Hackett  
District Structural Engineer

cc: Forrest Dockery, Doc's Marketing Corporation  
Alan Williams, Principal, Structural Safety Policy  
DSA Area Offices  
Terence Fong, Office of Statewide Health Planning and Development



# ICBO Evaluation Service, Inc.

5360 WORKMAN MILL ROAD • WHITTIER, CALIFORNIA 90601-2299

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## EVALUATION REPORT

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ER-5367

Reissued September 1, 1998

### Filing Category: FASTENERS—Screws (066)

**I-LAG™ BRAND EYE LAG SCREWS**  
**DOC'S MARKETING CORPORATION**  
**5158 GOLDMAN AVENUE, UNIT A**  
**MOORPARK, CALIFORNIA 93021**

#### 1.0 SUBJECT

I-LAG™ Brand Eye Lag Screws.

#### 2.0 DESCRIPTION

##### 2.1 General:

I-LAG brand screw fasteners, having part numbers 750 SD, 150 SP and 150 WS, are recognized for use as suspended ceiling fasteners. The I-LAG brand screws are eye lag type screws manufactured from 1018 steel. The 750 SD and 150 SP screws are manufactured from heat-treated steel and have an electroplated zinc Type II coating, giving them a yellowish or golden appearance. The 150 WS screw is manufactured from untreated steel and is either uncoated or has an electroplated zinc Type I coating.

**2.1.1 750 SD:** The 750 SD is a self-tapping screw fastener designed for use with metal framing. Each fastener is 2 inches (51 mm) long and consists of a 0.3-inch-long (7.6 mm) self-tapping portion, 0.5-inch-long (12.7 mm) threaded portion, 0.19-inch-diameter (4.8 mm) shank, and a 0.5-inch-diameter-by-0.08-inch-thick (12.7 mm by 2 mm) washer portion. The fastener portion above the washer consists of a 0.21-inch-diameter-by-0.6-inch-long (5.3 mm by 15 mm) shank portion and a 0.08-inch-thick-by-0.5-inch-long (2 mm by 12.7 mm) flattened eyelet portion having a 0.18-inch-diameter (4.6 mm) hole as shown in Figure 1.

**2.1.2 150 SP:** The 150 SP is a sharp-point screw fastener designed for use with metal or wood framing. Each fastener is 2<sup>3</sup>/<sub>4</sub> inches (70 mm) long and consists of a 1<sup>1</sup>/<sub>2</sub>-inch-long (38 mm) threaded portion, 0.19-inch-diameter (4.8 mm) shank, and a 0.5-inch-diameter-by-0.08-inch-thick (12.7 mm by 2 mm) washer portion. The fastener portion above the washer consists of a 0.21-inch-diameter-by-0.6-inch-long (5.3 mm by 15 mm) shank portion and 0.08-inch-thick-by-0.5-inch-long (2 mm by 12.7 mm) flattened eyelet portion having a 0.18-inch-diameter (4.6 mm) hole as shown in Figure 1.

**2.1.3 150 WS:** The 150 WS is a sharp-point screw fastener designed for use with wood framing. The 150 WS fastener dimensions are the same as the 150 SP screw fastener.

##### 2.2 Allowable Loads:

Allowable fastener loads are as shown in Table 1. The allowable loads for the 750 SD and 150 SP screw fasteners are

loads for screws fastened into steel sheets having minimum uncoated thicknesses of 0.030 inch, 0.036 inch, 0.047 inch and 0.062 inch (0.76 mm, 0.91 mm, 1.19 mm and 1.57 mm), and 36,000 psi (262 MPa) minimum yield strength.

Allowable loads for the 150 SP and 150 WS screw fasteners are based on fasteners attaching into lumber having minimum 0.46 specific gravity.

##### 2.3 Installation:

The self-tapping and sharp-point screws are installed without predrilling holes in the receiving material. Fasteners are installed with an eye lag jig pole, 1/4-inch (6.4 mm) hex driver and a variable speed drill having a minimum speed of 200 rpm. Installed fasteners must protrude through the attached steel members three full threads beyond the members and must be fully embedded into wood framing members. The distance from the center of a fastener to the edge and end of the steel and wood framing members shall not be less than 2 inches (51 mm).

##### 2.4 Identification:

Fasteners are embossed with four "I"s radiating from the shank on the top portion of the washer, or have the name "I-LAG" embossed on the flattened eyelet portion as shown in Figure 1. Each box of fasteners has a label bearing the I-LAG brand name, the manufacturer's name, the fastener type, the quantity and the ICBO ES evaluation report number (ER-5367) as noted in Figure 2.

#### 3.0 EVIDENCE SUBMITTED

Reports of shear and tension tests, installation instructions, and a quality control manual.

#### 4.0 FINDINGS

That the I-LAG brand screws described in this report comply with the 1997 *Uniform Building Code*™, subject to the following conditions:

- 4.1 Fasteners are installed in accordance with the manufacturer's instructions and this report.
- 4.2 Allowable tension values comply with Table 1.
- 4.3 Allowable loads shall not be increased due to duration of load such as wind or earthquake forces.
- 4.4 Calculations shall be submitted to the building official, proving that applied loads are less than the allowable loads in this report.

This report is subject to re-examination in one year.

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TABLE 1—ALLOWABLE SCREW LOADS (pounds)

I-LAG PART NUMBER	FRAMING MATERIAL									
	Steel (Thickness) <sup>1</sup>								Wood <sup>2,3</sup>	
	22 Gage (0.030 inch)		20 Gage (0.035 inch)		18 Gage (0.047 inch)		16 Gage (0.062 inch)		0.46 Specific Gravity	
	Tension	45 Degrees <sup>4</sup>	Tension	45 Degrees <sup>4</sup>	Tension	45 Degrees <sup>4</sup>	Tension	45 Degrees <sup>4</sup>	Tension	45 Degrees <sup>4</sup>
750 SD	135	170	170	190	245	280	340	375	NA	NA
150 SP	180	205	NA	NA	NA	NA	NA	NA	245	155
150 WS	NA	NA	NA	NA	NA	NA	NA	NA	270	140

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 psi = 6.9 kPa.

NA = Not applicable

<sup>1</sup>Values are based on steel sheets having a minimum yield strength of 38,000 psi.

<sup>2</sup>Based on a minimum 1 1/2-inch screw penetration into wood member.

<sup>3</sup>Wood specific gravity of 0.46 or greater.

<sup>4</sup>Load applied 45 degrees from the vertical and horizontal<sup>1</sup> direction.

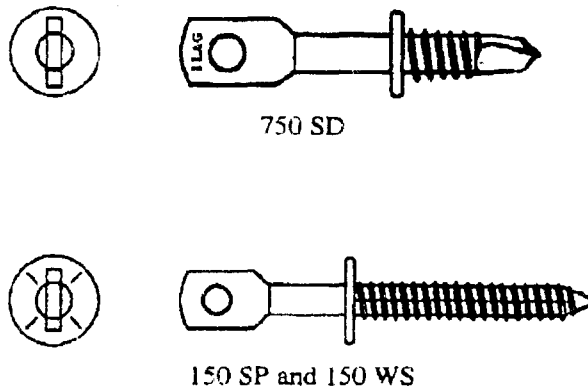
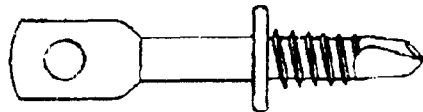


FIGURE 1—FASTENER TYPE AND IDENTIFICATION



**1000 PCS**  
**PART# 750 SD**

**I-LAG™ SELF DRILLING SHEET METAL SCREWS**

**ER-5367**

**FOR SUSPENDED CEILING APPLICATIONS ONLY**  
**SOLD BY WEIGHT 17 LB±**

DISTRIBUTED BY DOC'S MARKETING

MOORPARK, CA



**MADE IN USA**

FIGURE 2—IDENTIFICATION LABEL



SGS U.S. Testing Company Inc.

5555 Telegraph Road  
Los Angeles, CA 90040  
Tel: 213 838-1600  
Fax: 213 722-8251

REPORT NUMBER: 720210-1  
DATE: 12/24/96  
PAGE 1 OF 8

REPORT OF TEST

**CLIENT:** DOC'S MARKETING CORPORATION  
2343 Calle Alucema  
Thousand Oaks, CA 91360

**SUBJECT:** METAL SCREW

**REFERENCE:** Conferences and correspondence with Mr. Forrest Dockery commencing September 18, 1995.

**SAMPLE ID:** The following specimens were randomly sampled at Doc's Marketing Corporation, 5158 Goldman Ave. Unit A, Moorpark, CA 93021, by an SGS United States Testing Co. representative on October 7, 1996:

- 250 ea, 2-inch long, nominal, self-tapping, heat-treated, plated, steel, ceiling suspension fasteners Part Number -750SD. Each fastener consisted of a 0.3-inch long self-tapping portion, a 0.5-inch long threaded portion (0.19-inch shank diameter; 0.25-inch thread diameter), a 0.5-inch diameter by 0.08-inch thick washer portion, a 0.21-inch diameter by 0.6-inch long shank portion and a 0.08-inch thick by 0.5-inch long flattened, eyelet portion with a 0.18-inch diameter hole. The underside of the washer portion had a fan blade appearance.

The Rockwell C hardness of the sampled fasteners was 24, as determined by Metal Control Laboratories, Inc. in Montebello, CA on November 26, 1996.

SIGNED FOR THE COMPANY:

Marco Tachiquin  
Test Engineer

David Pereg  
Manager, Engr. Dept

Member of the SGS Group

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CLIENT: DOC'S MARKETING CORPORATION

REPORT OF TEST

**SUMMARY OF RESULTS:**

Steel	Orientation	Average Maximum Load (lbs)	Average Deflection (in)
16-gauge	Tensile	850	0.574
	Shear	1,020	1.493
	45 degrees	940	0.753
18-gauge	Tensile	615	0.472
	Shear	940	1.735
	45 degrees	700	0.763
20-gauge	Tensile	430	0.498
	Shear	780	1.695
	45 degrees	480	0.689
22-gauge	Tensile	340	0.433
	Shear	610	1.395
	45 degrees	430	0.802

**PROCEDURE:**

Fifteen tests were performed in tensile, shear and 45-degree orientations in 16, 18, 20 and 22-gage steel. Fifteen fasteners were drilled into corrugated, galvanized steel sections and tested in each orientation. The steel was secured to the fixed plate of an Instron machine and the eyelet of the fastener was secured to the moveable crosshead. Each fastener was then individually pulled out of the steel at a crosshead separation rate of 0.5-inch per minute until failure. The maximum load and deflection at maximum load were recorded.

**TEST DATES:**

Between October 29 and December 6, 1996