

APPROVAL REPORT

MODEL X-HS EXPLOSIVE-DRIVEN FASTENER PIPE HANGER COMPONENT, FOR AUTOMATIC SPRINKLER SYSTEMS

Prepared For:

**Hilti, Inc.
5400 South 122nd East Ave
Tulsa, OK 74147**

**Project Identifier: 3031301
Class 1956
Date of Approval: February 29, 2008**

Authorized by: 
Richard B. Dunne, Group Manager-Hydraulics

**MODEL X-HS
EXPLOSIVE-DRIVEN FASTENER
PIPE HANGER COMPONENT
FOR AUTOMATIC SPRINKLER SYSTEMS**

from

HLTI, INC.

5400 SOUTH 122nd EAST AVE

TULSA, OK 74147

I INTRODUCTION

- 1.1 Hilti, Inc. requested an Approval examination of their Model X-HS explosive driven fastener for use in steel.
- 1.2 This Report may be freely reproduced only in its entirety and without modification.
- 1.3 **Standards:**

Title	Class Number	Date
Approval Standard for Explosive-Driven Fasteners	1956	July 1970

- 1.4 **Listings:** These products will appear in the Automatic Sprinkler Systems' section of the FM Approval Guide under the heading, "FASTENERS, Explosive-Driven Fasteners" listed below.

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Fastener, Cat. No.	Rod Size, in.	For Use In	Max Pipe Size, in. (mm)
X-HS W6 U19 P8 S15	1/4	Steel	3-1/2 (89)
X-HS W10 U19 P8 S15	3/8	Steel	5 (127)

II DESCRIPTION

2.1 The explosive-driven fastener examined as part of this Approval examination is identified as a Model X-HS. The Fastener, Catalog Number identification, appears in the Approval Guide as follows:

- Model X-HS W6 U19 P8 S15 (For use with 1/4 in. rod size)
- Model X-HS W10 U19 P8 S15 (For use with 3/8 in. rod size)

2.2 The complete identification describing the letter designations of this fastener is below:

Identification	Description
X-HS	Hanger Designation
W6	1/4 in. threaded rod
W10	3/8 in. threaded rod
U19	Pin
P8	P – Plastic washer, 8 - For use in an 8 mm guidance tool
S15	S – Steel washer, 15 - Washer diameter in mm

2.3 Examination of this product is limited to the items identified in Section VIII, Documentation.

2.4 Refer to the Approval Report listed below for further information regarding currently Approved items.

Project ID	Report Date	Project Description
21514	May 15, 1972	Sprinkler Hanger Components
21514.1	July 25, 1972	Sprinkler Hanger Components
23804	August 8, 1973	Sprinkler Hanger Components
OK1H0.AH	April 19, 1984	Explosive-Driven Fasteners (Re-Examination)
3026695	October 31, 2006	Explosive-Driven Fasteners Models X-EW6H (1/4 in.) and X-EW10H (3/8 in.) power driven studs

III EXAMINATION AND TESTS

3.1 Samples, as detailed below, were submitted for examination and testing. The samples were considered to be representative of the product line and were examined, tested, and compared to the manufacturer's drawings. All data remains on file at FM Approvals along with other documents and correspondence applicable to this program.

3.2 The following tests were conducted in steel. Bending, tensile and shear tests were conducted to determine the holding power of the Model X-HS fasteners. A Hilti Model DX-460 tool was used to drive the samples into the steel.

3.3 TENSILE TEST

The Model X-HS samples, installed in steel as discussed in Section 3.1 of this report, were tested to determine their holding power. Each test sample met the minimum load requirement and the results were deemed satisfactory. These results are indicated in Table 3.3.

Table 3.3		
Size	Required Tensile Test Load lb. (N)	Maximum Load lb. (N)
1/4" rod, 1/4" steel	1250 (5560)	1510 (6715)
1/4" rod, 1/4" steel	1250 (5560)	1600 (7120)
1/4" rod, 1/4" steel	1250 (5560)	1580 (7030)
3/8" rod, 1/4" steel	1250 (5560)	2060 (9160)
3/8" rod, 1/4" steel	1250 (5560)	2175 (9670)
3/8" rod, 1/4" steel	1250 (5560)	2150 (9560)
1/4" rod, 3/8" steel	1250 (5560)	1500 (6670)
1/4" rod, 3/8" steel	1250 (5560)	1570 (6980)
1/4" rod, 3/8" steel	1250 (5560)	1570 (6980)
3/8" rod, 3/8" steel	1250 (5560)	2050 (9120)
3/8" rod, 3/8" steel	1250 (5560)	2080 (9250)
3/8" rod, 3/8" steel	1250 (5560)	2140 (9520)

3.4 BENDING TEST-FASTENERS IN A VERTICAL POSITION

The Model X-HS samples, installed in steel as discussed in Section 3.1 of this report, were tested to determine their holding power. A load of 20 lbs (90 N) at an angle of 90° to the hanger rod and at a distance of 15 in. (380 mm) from the steel was applied to each test sample. The test samples did not break or pull out as a result of these loads. The results were deemed satisfactory. These results are listed in Table 3.4 below.

Table 3.4		
Size	Required Load	Bending Load Test
1/4" rod, 1/4" steel	20 lb. (90 N)	Passed
1/4" rod, 1/4" steel	20 lb. (90 N)	Passed
1/4" rod, 1/4" steel	20 lb. (90 N)	Passed

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3.5 SHEAR TEST

Samples installed in steel as discussed in Section 3.1 of this report, were tested to determine their holding power. These samples met the minimum load requirement and the results were deemed satisfactory. These results are listed in Table 3.5.

Table 3.5		
Size	Required Tensile Test Load lb. (N)	Maximum Load lb. (N)
1/4" rod, 1/4" steel	1250 (5560)	1735 (7715)
1/4" rod, 1/4" steel	1250 (5560)	1670 (7430)
1/4" rod, 1/4" steel	1250 (5560)	1810 (8050)
3/8" rod, 1/4" steel	1250 (5560)	2075 (9230)
3/8" rod, 1/4" steel	1250 (5560)	2195 (9760)
3/8" rod, 1/4" steel	1250 (5560)	2120 (9430)
1/4" rod, 3/8" steel	1250 (5560)	1355 (6025)
1/4" rod, 3/8" steel	1250 (5560)	1430 (6360)
1/4" rod, 3/8" steel	1250 (5560)	1255 (5580)
3/8" rod, 3/8" steel	1250 (5560)	2135 (9495)
3/8" rod, 3/8" steel	1250 (5560)	2245 (9985)
3/8" rod, 3/8" steel	1250 (5560)	2170 (9650)

3.6 The models submitted for Approval were examined and found to represent the design adequately.

3.7 No other tests on the explosive driven fastener were deemed necessary.

IV MARKING

4.1 The product model number information is as follows:

- Model X-HS W6 U19 P8 S15 (1/4 in. rod size)
- Model X-HS W10 U19 P8 S15 (3/8 in. rod size)

4.2 The following information appears on the label of each box for the fastener for use with the 1/4 inch rod size:

- X-HS W6 U19 P8 S15 (Fastener)
- # 386216 (Item Number/Catalog Number)
- FM Approved
- Made in Austria

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4.3 The following information appears on the label of each box for the fastener for use with the 3/8 inch rod size:

- X-HS W10 U19 P8 S15 (Fastener)
- # 386217 (Item Number/Catalog Number)
- FM Approved
- Made in Austria

V REMARKS

- 5.1 This model fastener must be installed in accordance with the manufacturer's installation instructions.
- 5.2 Fasteners should not be used for support of pipe hangers to structural members in Earthquake Zones 150 or less as defined by FM Global Property Loss Prevention Data Sheet 1-2S.

VI FACILITIES AND PROCEDURES AUDIT

The Model X-HS described in this Report is Approved when manufactured at the following facility:

WP Woergartner Produktions GmbH
Bahnhofstrasse 21
A-6372 Oberndorf
Tirol, Austria

This manufacturing site is subject to follow-up audit inspections. The facilities and quality control procedures in place have been found to be satisfactory to manufacture product identical to that examined and tested as described in this report.

VII Manufacturer's Responsibilities

- 7.1 Documentation considered critical to this Approval is on file at FM Approvals and listed in the Documentation Section of this Report. No changes of any nature shall be implemented unless notice of the proposed change has been given and written authorization obtained from FM Approvals. The Approved Product Revision Report, Form 797, shall be forwarded to FM Approvals as notice of proposed changes.
- 7.2 These explosive driven fasteners are Approved when installed according to the manufacturer's installation instructions.

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VIII DOCUMENTATION

The following drawings describe the models and are filed under Project ID: 3031301:

Description	Part Number	Revision
Abhaenger X-HS	321368	E
Hilti-Rondelle R120	321797	B
Universalnagel X-U	381182	F
Deckenabhaenger X-HS U P8S15	386328	B

IX CONCLUSION

The model X-HS explosive-driven fastener described in Section 2.1 meets FM Approval requirements. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective the date of this Report.

TESTS BY: Hilti, Inc. personnel

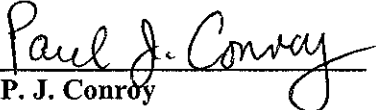
TESTS WITNESSED BY: G. Salvati

EXAMINATION BY: G. Salvati

PROJECT DATA RECORD: Project ID: 3031301

ORIGINAL PROJECT DATA RECORD: Project ID: 21514

REPORT BY: **REVIEWED BY:**


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