ES REPORT™

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Filing Category: FASTENERS—Concrete and Masonry Anchors (066)

KWIK CON II CONCRETE AND MASONRY SCREW ANCHORS

HILTI, INC.
5400 SOUTH 122nd EAST AVENUE
TULSA, OKLAHOMA 74147

1.0 SUBJECT

Kwik Con II Concrete and Masonry Screw Anchors.

2.0 DESCRIPTION

2.1 General:

The Kwik Con II concrete screw anchors are manufactured from AISI 1022 steel and are for installation in concrete and masonry substrates. They are heat-treated and have zinc plate, clear chromate finish. The screw anchors are available in $^3/_{16}$-, $^1/_4$-, and $^3/_8$-inch (4.8, 6.4 and 9.5 mm) diameter sizes with various lengths. Three head styles are available for the Kwik Con II screw: slotted hex washer head, Phillips flat head, and Torx flat head.

2.2 Installation:

A pilot hole is drilled using a carbide-tipped drill bit supplied with each box of Kwik Con II screw anchors. Pilot holes are 0.17 inch (4.3 mm) in diameter for the $^3/_{16}$-inch (4.8 mm) anchor, 0.20 inch (5.1 mm) in diameter for the $^1/_4$-inch (6.4 mm) anchor, and 0.3 inch (7.6 mm) in diameter for the $^3/_8$-inch (9.5 mm) anchor. Pilot holes are drilled a minimum of $^1/_4$ inch (6.4 mm) longer than the necessary embedment specified in this report.

After the pilot hole is drilled, dust is removed and the Kwik Con II screw anchors are installed to the specified depth of embedment.

The anchors are installed a minimum of 12 diameters on center with a minimum edge distance of six diameters for 100 percent anchor efficiency. Spacing and edge distance may be reduced to six diameter spacing and three diameter edge distance providing values are reduced 50 percent. Linear interpolation may be used for intermediate spacing and edge margins.

2.3 Design:

The allowable tension and shear loads are indicated in Table 1. Allowable loads for Kwik Con II screw anchors subjected to combined shear and tension loads is determined by the following equation.

$$(P_s/P_t) + (V_s/V_t) \leq 1$$

where:

P_s = Applied tension load.

P_t = Allowable tension load in Table 1.

V_s = Applied shear load.

V_t = Allowable shear load in Table 1.

The screw anchors are not permitted to be subjected to vibratory loads such as reciprocating engines, crane loads and moving loads due to vehicles. Anchors are limited to static load applications. Use of anchors in resisting earthquake or wind loads is beyond the scope of this report.

2.4 Special Inspection:

Where special inspection, in accordance with the code, is required in Table 1, the special inspector must be on the jobsite continuously to verify anchor type and dimensions, concrete or masonry type, concrete compressive strength, mortar type, drill bit size, hole dimensions, anchor spacing and edge distance, slab thickness and anchor embedment.

2.5 Identification:

Kwik Con II screw anchors are packaged in containers that indicate the manufacturer's name and address, the diameter, the length and the fastener type.

3.0 EVIDENCE SUBMITTED

Reports of load tests and installation instructions.

4.0 FINDINGS

That the Kwik Con II Concrete Screw Anchors described in this report comply with the 1997 *Uniform Building Code*™, the 2000 *International Building Code*® and the 2000 *International Residental Code*™, subject to the following conditions:

4.1 Anchor size, installation and dimensions are as set forth in this report.

4.2 Allowable shear and tension loads are as set forth in Table 1.

4.3 Calculations demonstrating that the applied loads comply with this report must be submitted to the building official for approval.

4.4 Anchors are limited to nonfire-resistive construction unless appropriate data is submitted to demonstrate that screw performance is maintained in fire-resistive situations.

4.5 Special inspection, when required by Table 1, is provided according to Section 2.5 of this report.

4.6 When the anchors are placed without special inspection, the installer must certify to the building official that screws were installed according to the manufacturer's instructions and this report.

This report is subject to re-examination in two years.

TABLE 1—ALLOWABLE SHEAR AND TENSION VALUES FOR KWIK CON II CONCRETE SCREW ANCHORS, IN POUNDS[1]

ANCHOR DIAMETER (inch)	MINIMUM DEPTH OF EMBEDMENT (inches)	f'_c = 2,000-PSI CONCRETE[1]			GROUTED MASONRY[2, 3]			HOLLOW MASONRY[2]		
		Tension			Tension			Tension		
		With Special Inspection[4]	Without Special Inspection[5]	Shear	With Special Inspection[4]	Without Special Inspection[5]	Shear	With Special Inspection[4]	Without Special Inspection[5]	Shear
3/16	1	155	75	195	215	105	225	215	105	225
	1 3/4	450	225	215	435	215	275	335	165	275
1/4	1	155	175	325	215	105	460	215	105	490
	1 3/4	460	230	455	585	290	500	375	185	490
3/8	1 3/4	540	270	900	715	355	1,085	NR[6]	NR[6]	NR[6]

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

[1]The tabulated shear and tensile values are for anchors installed in stone-aggregate concrete of normal weight and having the designated compressive strength at time of installation.

[2]The tabulated shear and tensile values are for anchors installed in masonry conforming to ASTM C 90, Grade N, Type I, or better, with mortar conforming to Section 2103.3 and Table 21-A of the code.

[3]Grout material shall have a minimum compressive strength of 2,000 psi at time of installation and shall conform to Section 2103.4 of the code.

[4]These tension values are applicable only when the anchors are installed with special inspection as set forth in the code.

[5]These tension values are applicable when the anchors are installed without special inspection as set forth in the code.

[6]NR = Not recognized.