SBCCI PUBLIC SAFETY TESTING AND EVALUATION SERVICES INC.
900 Montclair Road, Suite A; Birmingham, Alabama 35213-1206
a Participating Member of the NES, Inc.

Evaluation Reports are the opinion of the Committee on Evaluation, based on the findings, and do not constitute or imply an approval or acceptance by any local community. The Committee, in review of the data submitted, finds that in their opinion the product, material, system, or method of construction specifically identified in this report conforms with or is a suitable alternate to that specified in the Standard Codes, SUBJECT TO THE LIMITATIONS IN THIS REPORT.

The Committee on Evaluation has reviewed the data submitted for compliance with the *Standard Building Code®, the SBCCI Standard for Hurricane Resistant Residential Construction® SSTD10-97,* and the CABO One and Two Family Dwelling Code and submits to the building official or other authority having jurisdiction the following report. The Committee on Evaluation, SBCCI PST & ESI and its staff are not responsible for any errors or omissions to any documents, calculations, drawings, specifications, tests or summaries prepared and submitted by the design professional or preparer of record that are listed in the Substantiating Data Section of this report.

REPORT NO.: 9759

EXPIRES: See current SBCCI PST & ESI EVALUATION REPORT LISTING

CATEGORY: FASTENERS FINAL REPORT

SUBMITTED BY:

ILLINOIS TOOL WORKS - BUILDEX DIVISION
1349 WEST BRYN MAWR AVENUE
ITASCA, ILLINOIS 60143

1. PRODUCT TRADE NAME

Tapcon® Anchors:

1.1 Tapcon (HWH and PFH)
1.2 Maxiset Tapcon
1.3 Scots Tapcon

Licensees:

Illinois Tool Works, Inc.
Brands Division
226 Gerry Drive
Wood Dale, Illinois 60197

Illinois Tool Works, Inc.
Ramset/Red Head Division
1300 North Michael Drive
Wood Dale, Illinois 60191

2. SCOPE OF EVALUATION

Structural

3. USES

Tapcon Anchors are used for fastening into concrete or masonry for anchorage of wood sill plates, steel stud plates, tracks for suspended ceilings and general fastening applications.

4. DESCRIPTION

4.1 General

Tapcon Anchors are screw anchors that are manufactured from AISI SAE 1022 carbon steel. The screw anchors are heat treated with alternating high low thread form and are available in 3/16 inch and 1/4 inch (4.8 and 6.4 mm) diameter sizes and various lengths. The fasteners are available in different head styles and noted in Section 4.2 below.

4.2 Fastener Types

Tapcon Slotted HWH - Hex Washer Head
Tapcon PFH - Phillips FlatHead
Maxiset Tapcon
Scots Tapcon (supplied with EPDM washer)

The top of all screw heads are marked with the initials "BX".

4.3 Allowable Loads

The fasteners were load tested for shear and tension and allowable loads with minimum edge distance, embedment, spacings, and concrete strength as listed in Table 1 of this report.

5. INSTALLATION

5.1 General

Tapcon Anchors are installed in accordance with the manufacturer's published installation instructions and this report.

The size, type, minimum spacing, minimum edge distance, minimum embedment, and installation methods shall be in accordance with this report and the manufacturer's recommendations. Loads shall not exceed the allowable loads listed in this report. The allowable loads shall be compared to the materials used in actual installations and shall always be equal to or less than the allowable loads for the materials used.

Anchors shall be installed in holes predrilled with a carbide-tipped masonry drill manufactured within the range of the maximum and minimum drill tip dimensions of ANSI Standard B94.12-1977 and supplied with by ITW Buildex with the Tapcon Anchors. Pilot holes 0.17 inch (4.3 mm) in diameter for the 3/16 inch (4.8 mm) diameter anchor and 0.20 inch (5.1 mm) in diameter for the 1/4 inch (6.4 mm) anchor are drilled 1/4 inch (6.4 mm) longer than the required anchor embedment. The dust in the pilot hole is cleaned out before installation of the screw anchor.

Anchors shall not be installed before the concrete has developed its design strength.

The anchors are installed a minimum of 12 diameters on center with a minimum edge distance of 10 diameters for 100% anchor efficiency. Spacing and edge distance may be reduced to 6 diameter spacing and 5 diameter edge distance providing allowable loads are reduced 50%. Linear interpolation may be used for intermediate spacing and edge margins.

The manufacturer's published installation instructions and this report shall be strictly adhered to and a copy of these instructions shall be available at all times on the job site during installation.

The instructions within this report govern if there are any conflicts between the manufacturer's instructions and this report.

5.2 Special Inspection

When Special Inspection is required as noted in the design tables, the construction shall be inspected by a registered engineer or architect, preferably the one responsible for the design, or by a competent representative responsible to the registered engineer or architect.

Such inspection shall be of a nature as to determine that the construction and quality of work are in accordance with the contract drawings and specifications and the manufacturer's installation instructions.

Items to be verified by the special inspector include tightening torque, screw type, hole diameter, screw diameter, screw embedment, screw spacing, edge distances, concrete type, concrete compressive strength, slab thickness, grade of steel, and other requirements specified in this report and the manufacturer's instructions.

TABLE 1 - ALLOWABLE SHEAR AND TENSION VALUES FOR TAPCON ANCHORS, IN POUNDS (LBS)

Anchor Dia. (In)	Minimum Depth of Embedment (Inches)	CMU			f'_c = 2000 psi			f'_c = 3000 psi			f'_c = 4000 psi		
		Tension		V	Tension		V	Tension		V	Tension		V
		wsi	wosi		wsi	wosi		wsi	wosi		wsi	wosi	
3/16	1	69	34	104	69	34	104	108	54	133	125	62	134
	1-1/4	105	53	113	105	53	113	182	91	133	199	99	133
	1-1/2	-	-	-	140	70	174	274	137	167	280	140	193
	2	-	-	-	283	141	277	372	186	183	408	204	194
1/4	1	104	52	160	104	52	160	153	76	275	243	122	304
	1-1/4	128	64	202	128	64	202	201	100	283	280	140	307
	1-1/2	-	-	-	196	98	239	349	174	313	410	205	349
	2	-	-	-	364	182	320	487	243	376	528	264	416

Table 1 Notes:

1. SI Units conversion: 1 in = 25.4 mm, 1 lbf = 4.5 N, 1 psi = 6.9 kPa
2. WOSI = With Out Special Inspection see 5.2.
3. WSI = With Special Inspection see 5.2.
4. CMU is Hollow Concrete Masonry Unit with a minimum f' of 1200 psi.

6. SUBSTANTIATING DATA

6.1 Manufacturer's descriptive literature, specifications, and installation instructions.

6.2 Engineering drawings of Tapcon Anchors, ITW Buildex.

6.3 Test report on shear and tension load tests under ASTM E 488, Hurricane Engineering & Testing Inc., HETI-96-3013a, November 27, 1996, signed by Dr. Walker Ali, and signed and sealed by Hector M. Medina, P.E.

6.4 Test report on compressive strength of concrete under ASTM C 39 used in shear and tension testing, All State Engineering & Testing Consultants, Inc., March 7, 1996, signed by Alberto Ramirez, P.E.

6.5 Engineering calculations evaluating the load tests, Hurricane Engineering & Testing, Inc., HETI-97-3028, July 25, 1997, signed and sealed by Hector M. Medina, P.E.

FINAL REPORT

7. CODE REFERENCES

Standard Building Code® - 1997 Edition

Section 103.7	Alternate Materials and Methods
Chapter 16	Structural Loads
Chapter 17	Structural Tests and Inspections
Chapter 19	Concrete
Chapter 22	Steel
Chapter 23	Wood
Section 2306	Fastenings
Section 2307.1	Sill on Foundation

SBCCI Standard for Hurricane Resistant Residential Construction® SSTD10-97

Section 101.4	Alternate Materials and Methods
Section 104	Design Criteria
Section 202.1.8	Fasteners and Connectors
Figure 203D	Stemwall Foundation with Wood-Framed Floor
Section 204.3.8	Connections
Section 302.1	Fasteners and Connectors
Section 303.2.3	Sill Plate to Foundation Anchorage

CABO One and Two Family Dwelling Code - 1995 Edition with 1996/1997 Amendments

Section 108	Alternate Materials and Systems
Section 301	Design Criteria
Section 402.1	Fasteners
Section 402.2	Concrete
Table 402.2	Minimum Specified Compressive Strength of Concrete
Figure 403	Footings
Chapter 5	Floors
Chapter 6	Wall Construction

8. COMMITTEE FINDINGS

The Committee on Evaluation in review of the data submitted finds that, in their opinion, the Tapcon® Anchors as described in this report conform with or are suitable alternates to that specified in the *Standard Building Code®, the SBCCI Standard for Hurricane Resistant Residential Construction® SSTD10-97*, and the CABO One and Two Family Dwelling Code or Supplements thereto.

9. LIMITATIONS

9.1 This Evaluation Report and the installation instructions, when required by the building official, shall be submitted at the time of permit application.

9.2 Design loads shall not exceed those specified in Table 1. These loads are for the fastener. Wood and steel members connected must be investigated with accepted design criteria. Calculations and details showing that the anchors comply with this report shall be submitted to the building official for approval.

9.3 All fasteners shall be installed according to manufacturer's directions using Buildex components, Tapcon Anchors, Condrive Tools, and Tapcon Drill Bits for the specific use, application, or installation encountered.

9.4 Anchor installation which requires special inspection as noted in the tables shall be subjected to Special Inspection as defined in Section 5.2 of this report.

9.5 Maximum allowable shear and tension loads, minimum embedment depths, minimum spacing, edge and end distances for concrete installations shall be in accordance with the Table in this report.

9.6 Allowable loads for anchors in concrete subjected to combined shear and tension forces are determined by the ratio of the actual shear to the allowable shear plus the ratio of the actual tension to the allowable tension not exceeding 1.00.

9.7 The allowable loads listed in this report apply to static loading conditions only. Anchors shall not be subjected to dynamic vibratory or shock loads, such as supports for reciprocating engines or crane rails unless adequacy is determined by tests with results approved by the building official. This report does not include an evaluation for seismic performance in applications where seismic analysis is required by the *Code* and the fasteners shall not be used to provide lateral support for concrete or masonry walls through withdrawal strength.

9.8 The allowable loads shown in the tables are maximum values and they shall not be increased for wind or seismic loads.

9.8 The anchors shall not be used to support fire resistive construction.

9.9 Anchors that are exposed directly to weather or subject to salt corrosion in coastal areas, shall be stainless steel or hot dipped galvanized in accordance with 202.1.8.3 and 302.1.3 of SSTD 10-97.

10. IDENTIFICATION

Each package of Tapcon Anchors covered by this report shall be labeled with the manufacturer's name and/or trademark, the SBCCI Public Safety Testing and Evaluation Services Inc. Seal or initials (SBCCI PST & ESI), and the number of this report for field identification.

The phrase **"Refer to this Evaluation Report for Code compliance"** shall be printed in the manufacturer's literature and installation instructions referencing this Evaluation Report number.

11. PERIOD OF ISSUANCE

SEE CURRENT SBCCI PST & ESI EVALUATION REPORTS LISTING FOR STATUS OF THIS EVALUATION REPORT. FINAL REPORT

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