Code Compliance Research Report
CCRR-0350

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DIVISION: 06 00 00 – Wood, Plastics, and Composites
Section: 06 05 23 Wood, Plastic, and Composite Fastenings

REPORT HOLDER:
American Fastening Systems
2055 White Bear Avenue North
Maplewood, MN 55109
651-482-1234
http://www.woodprofasteners.com

REPORT SUBJECT:
WoodPro Premium Washer Head Screws

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2024, 2021, 2018 *International Building Code®* (IBC)
- 2024, 2021, 2018 *International Residential Code®* (IRC)

NOTE: This report references the most current Code editions noted. Section numbers in earlier editions may differ.

1.2 WoodPro Premium Washer Head Screws have been evaluated for the following properties:

- Structural
- Corrosion resistance

1.3 WoodPro Premium Washer Head Screws have been evaluated for the following uses:

- Connections in wood construction for wood-to-wood fastening designed in accordance with the IBC and IRC including the 2024 ANSI/AWC National Design Specification (NDS) for Wood Construction.
- Exterior applications including use in alkaline copper quaternary (ACQ-D) preservative treated wood.

2.0 STATEMENT OF COMPLIANCE

WoodPro Premium Washer Head Screws comply with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when used as described in this report, including the Conditions of Use stated in Section 6.

2.1 2024 IBC and IRC Evaluation Reports

The Intertek CCRR is an *Evaluation Report* for approval of an alternate material, design, or method of construction in accordance with Section 104.2.3.6.1 of the 2024 IBC and Section R104.2.2.6.1 of the 2024 IRC.

3.0 DESCRIPTION

WoodPro Premium Washer Head Screws are coated, heat-treated steel wood screws with a Type 17 point, patented ASTER thread and a Torx drive head; manufactured in 1/4", 5/16" and 3/8" diameters and lengths from 1-1/2" to 10". See Table 2 for additional description. The WoodPro screws have either a golden or black colored coating.

4.0 PERFORMANCE CHARACTERISTICS

4.1 Fastener Design Strength: Allowable shear and tension strength are provided in Table 1.

4.2 Withdrawal Design Value: Reference withdrawal design values (*W*) for loading parallel and perpendicular to grain are provided in Table 2.

4.3 Pull-Through Design Value: Reference withdrawal design values (*P*) for loading parallel and perpendicular to grain are provided in Table 2. Pull-Through design values apply to wood side members with a minimum 3/4" thickness.

4.4 Lateral Design Value: Reference lateral design values (*Z*) for loading parallel and perpendicular to grain are provided in Table 3.

4.5 Corrosion resistance: WoodPro Premium Washer Head Screws have corrosion resistance equivalent to ASTM A153, Class D hot-dip zinc coating and are evaluated for exposure condition 3 in accordance with ICC-ES AC257 including use in alkaline copper quaternary (ACQ-D) preservative treated wood.
AC257 Exposure condition 3 - General construction. Limited to freshwater and chemically treated wood exposure, e.q. no saltwater exposure.

5.0 INSTALLATION

5.1 General:
WoodPro Premium Washer Head Screws must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

5.2 Minimum spacing, end distance and edge distance shall be sufficient to prevent splitting of the wood, or no less than the NDS minimums specified in NDS chapter 12 or no less than SCL manufacturer instructions, whichever is the more restrictive.

6.0 CONDITIONS OF USE

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 Design and installation of connections shall be in accordance with the ANSI/AWC National Design Specification (NDS) for Wood Construction by a qualified design professional.

6.3 The allowable load for a single-screw connection in which the screw is subject to tension is the least of: (a) the reference withdrawal design value given in Table 2, adjusted by all applicable adjustment factors; (b) the reference head pull-through design value give in Table 2, adjusted by all applicable adjustment factors; and (c) the allowable screw tension strength give in Table 1.

6.4 Th allowable lateral load for a single-screw connection is the lesser of: (a) the reference lateral design value given in Table 3, adjusted by all applicable adjustment factors, and (b) the allowable screw shear strength given in Table 1.

6.5 WoodPro Premium Washer Head Screws are manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Data in accordance with the ICC-ES Acceptance Criteria for Alternative Dowel-Type Fasteners, AC233 October 2020.

7.2 Data in accordance with the ICC-ES Acceptance Criteria for Corrosion-Resistant Fasteners, AC257 June approved 2023, editorially revised May 2024.

8.0 IDENTIFICATION

WoodPro Premium Washer Head Screws are identified with the manufacturer's name (American Fastening Systems), address and telephone number, the product name, the Intertek Mark as shown below, and the Code Compliance Research Report number (CCRR-0350).

CODE COMPLIANCE
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9.0 OTHER CODES

This section is not applicable.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the https://bpdirectory.intertek.com is recommended to ascertain the current version and status of this report.

TABLE 1 – FASTENER DIMENSIONS AND STRENGTHS

FASTENER DESIGNATION	OVERALL LENGTH[1] (inches)	THREAD LENGTH[2] (inches)	ROOT DIAMETER (inch)	SHANK DIAMETER (inch)	OUTSIDE THREAD DIAMETER (inch)	HEAD DIAMETER, D_H (inch)	BENDING YEILD STRENGTH[3] F_{yb} (psi)	ALLOWABLE FASTENER STRENGTH	
								Tension (lbf)	Shear (lbf)
ST14X112	1 - 1/2	1.024	0.153	0.175	0.244	0.522	214,286	1,291	821
ST14X2	2	1.299							
ST14X212	2 – 1/2	1.575							
ST14X318	3 – 1/8	2.087							
ST14X312	3 – 1/2	2.362							
ST516X212	2 – 1/2	1.575	0.169	0.197	0.280	0.640	264,719	1,558	990
ST516X318	3 – 1/8	2.087							
ST516X312	3 – 1/2	2.362							
ST516X4	4	2.598							
ST516X518	5 – 1/8	3.150							
ST516X6	6	3.543							
ST38X714	7 – 1/4	3.937	0.200	0.230	0.308	0.695	229,646	2,331	1,490
ST38X8	8	3.937							
ST38X10	10	3.937							

For SI: 1 inch = 25.4 mm; 1 lbf = 4.4 N; 1 psi = 6.9 kPa.

1. For fasteners with washer heads, overall length is measure from underside of head to bottom of tip.
2. Length of thread incudes tip
3. Bending yield strength determined in accordance with ASTM F1575 using the root diameter



General (for illustration)

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TABLE 2 – REFERENCE WITHDRAWAL DESIGN VALUES (*W*)[1] AND PULL-THROUGH DESIGN VALUES (*P*)[1]

FASTENER DESIGNATION	THREAD LENGTH[2], L (inches)	*W* (lbf/in.) FOR SPECIFIC GRAVITY[3] OF:		*P* (lbf) FOR SPECIFIC GRAVITIY[3, 4] OF:	
		0.42	0.55	0.42	0.55
ST14X112	1.024	122	253	177	255
ST14X2	1.299				
ST14X212	1.575				
ST14X318	2.087				
ST14X312	2.362				
ST516X212	1.575	133	307	209	259
ST516X318	2.087				
ST516X312	2.362				
ST516X4	2.598				
ST516X518	3.150				
ST516X6	3.543				
ST38X714	3.937	149	252	216	260
ST38X8	3.937				
ST38X10	3.937				

For **SI:** 1 inch = 25.4 mm; 1 lbf/in = 175N/m

1. Values shall be multiplied by all applicable adjustment factors (see NDS).
2. Reference withdrawal design values must be multiplied by the length of thread penetration in the main member. Length includes tapered tip.
3. Specific gravity must be the assigned specific gravity for sawn lumber or wood structural panels per NDS table 12.3.3A or 12.3.3B respectively or structural composite lumber (SCL) equivalent specific gravity in accordance with ASTM D5456.
4. Pull-through design values in Table 3 apply to connections having a minimum wood side member thickness of 3/4".
5. For wood species specific gravities that are between 0.42 and 0.55, use the design values in Table 3 with specific gravity of 0.42.

TABLE 3 – REFERENCE LATERAL DESING VALUES (*Z*) FOR SINGLE SHEAR (TWO-MEMBER) CONNECTIONS[1]

FASTENER DESIGNATION	SIDE MEMBER THICKNESS, t_s (inch)	FASTENER PENETRATION, p (inch)	REFERENCE LATERAL DESIGN VALUE (Z) FOR SPECIFIC GRAVITIES[3] OF: (lbf)[3]							
			0.42				0.55			
			$Z_{\parallel}$	$Z_{\perp s}$	$Z_{\perp m}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp s}$	$Z_{\perp m}$	$Z_{\perp}$
ST14X112	3/4	3/4	90	34	43	20	64	56	62	42
ST14X2	3/4	1 – 1/4	137	55	53	44	182	79	160	70
ST14X212	3/4	1 – 3/4	163	69	59	54	163	176	88	80
ST14X318	1 – 1/2	1 – 5/8	158	77	86	79	223	104	112	97
ST14X312	1 – 1/2	2	175	92	76	78	276	205	224	123
ST516X212	3/4	1 – 3/4	79	79	68	45	216	90	92	65
ST516X318	1 – 1/2	1 – 5/8	66	77	67	60	115	74	98	97
ST516X312	1 – 1/2	2	76	82	81	81	140	120	126	115
ST516X4	1 – 1/2	2 – ½	91	178	91	78	160	252	135	110
ST516X518	1 – 1/2	3 – 5/8	88	108	76	102	138	135	117	120
ST516X6	3	3	206	121	114	116	259	130	125	132
ST38X714	3	4 – 1/4	265	137	143	114	321	323	147	154
ST38X8	3 – 1/2	4 – 1/2	273	147	139	149	194	172	153	123
ST38X10	3 – 1/2	6 – 1/2	284	264	279	140	334	190	183	134

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

1. Values must be multiplied by all applicable adjustment factors (see NDS).
2. Specific gravity must be assigned specific gravity for sawn lumber or wood structural panels per NDS Table 12.3.3A or 12.3.3B, respectively, or structural composite lumber (SCL) equivalent specific gravity in accordance with ASTM D5456.
3. For wood species specific gravities that are between 0.42 and 0.55, use the design values in Table 3 with specific gravity of 0.42.