



Most Widely Accepted and Trusted

ICC-ES Evaluation Report

ESR-3201

ICC-ES | (800) 423-6587 | (562) 699-0543 | www.icc-es.org

Reissued 07/2017
This report is subject to renewal 07/2018.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
SECTION: 06 05 23—WOOD, PLASTIC, AND COMPOSITE FASTENINGS

REPORT HOLDER:

GRK FASTENERS, A DIVISION OF ILLINOIS TOOL WORKS, INC.

**1452 BREWSTER CREEK BOULEVARD
BARTLETT, ILLINOIS 60103**

EVALUATION SUBJECT:

**R4™ MULTI PURPOSE SCREW, FIN/TRIM™ SCREW, KAMELEON™ SCREW,
RT COMPOSITE™ SCREW AND CLIMATEK™ COATING**



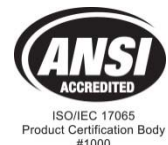
Look for the trusted marks of Conformity!

“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”



A Subsidiary of  **INTERNATIONAL CODE COUNCIL™**

ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.



ICC-ES Evaluation Report

ESR-3201

Reissued July 2017

This report is subject to renewal July 2018.

www.icc-es.org | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 05 23—Wood, Plastic and Composite Fastenings

REPORT HOLDER:

GRK FASTENERS, A DIVISION OF ILLINOIS TOOL WORKS, INC.
1452 BREWSTER CREEK BOULEVARD
BARTLETT, ILLINOIS 60103
(877) 489-2726
www.grkfasteners.com
grk@grkfasteners.com

EVALUATION SUBJECT:

R4™ MULTI PURPOSE SCREW, FIN/TRIM™ SCREW, KAMELEON™ SCREW, RT COMPOSITE™ SCREW AND CLIMATEK™ COATING

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Structural
- Corrosion resistance

2.0 USES

The R4™ Multi Purpose Screw, Fin/Trim™ Screw, Kameleon™ Screw and RT Composite™ Screw fasteners are alternate dowel-type, multipurpose screws, less than 1/4 inch (6.4 mm) in shank diameter, used in wood-to-wood connection applications. Climatek™ coated screws are used where carbon steel screws must exhibit corrosion resistance when exposed to adverse environmental conditions and/or preservative-treated wood, and are alternates to stainless steel or hot-dip-zinc galvanized fasteners with a coating weight in compliance with ASTM A153, Class D. The Climatek™ coated screws have been evaluated for use with wood chemically treated with

waterborne alkaline copper quaternary (ACQ-D) preservative and copper azole (CA-B) preservative.

3.0 DESCRIPTION

3.1 General:

Carbon steel fasteners are made from steel wire, hardened after forming and then coated with Climatek™. The proprietary Climatek™ coating consists of multiple layers of various materials, including layers of zinc and polymer.

PHEinox™ fasteners are formed from Grade 305 stainless steel wire.

The fasteners are self-tapping screws which have star shaped driving recesses in the heads.

See Tables 1A and 1B for all fastener dimensions and Figure 1 for details.

3.2 R4™ Multi Purpose Screw:

The R4™ Multi Purpose Screw fasteners have a countersunk head with cutting pockets and teeth, CEE-Thread™ rolled threads, rolled W-Cut™ threads and a Type 17 point (Zip-Tip™). Carbon steel and PHEinox™ versions of the R4 screws have been evaluated.

3.3 Trim™ Screw:

3.3.1 Fin/Trim™ Screw: The Fin/Trim™ Screw fasteners have a finish head, rolled threads, rolled W-Cut™ threads and a Type 17 point (Zip-Tip™). Carbon steel and PHEinox™ versions of the Fin/Trim™ screws have been evaluated.

3.3.2 RT Composite™ Screw: The RT Composite™ screws are the same as the Fin/Trim™ screws described in Section 3.3.1, except they have a reversed thread beneath the head. Only the PHEinox™ version of the RT Composite screw has been evaluated.

3.4 Kameleon™ Screw:

The Kameleon™ fasteners have a pan framer head with saw-blade-like cutting teeth, rolled rings with three indented fiber traps on each ring, CEE-Thread™ rolled threads, rolled W-Cut™ threads and a Type 17 point (Zip-Tip™). Only the carbon steel version of the Kameleon™ screw has been evaluated.

4.0 DESIGN AND INSTALLATION

4.1 Design:

Allowable fastener tension and shear strengths are given in Table 1. Wood main and side members must be solid-

sawn lumber having an assigned specific gravity of 0.67 or greater, as specified in Table 12.3.3A of the 2015 ANSI/AWC National Design Specification (NDS) for Wood Construction (Table 11.3.3A of NDS-12 for the 2012 IBC; Table 11.3.2A of NDS-05 for the 2009 and 2006 IBC). Reference withdrawal design values are given in Tables 2A and 2B. Reference pull-through design values are given in Tables 3A and 3B. Reference lateral design values for wood-to-wood connections loaded parallel to the grain are given in Tables 4A and 4B.

For the carbon steel fasteners, 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 2A, adjusted by all applicable adjustment factors; (b) the reference head pull-through design value given in Table 3A, adjusted by all applicable adjustment factors; and (c) the allowable screw tension strength given in Table 1. For the stainless steel fasteners (PHEinox™), 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 2B; (b) the reference head pull-through design value given in Table 3B, adjusted by all applicable adjustment factors; and (c) the allowable screw tension strength given in Table 1.

The allowable lateral load for a single-screw connection is the lesser of: (a) the reference lateral design value given in Tables 4A and 4B, adjusted by all applicable adjustment factors; and (b) the allowable screw shear strength given in Table 1.

Connections containing multiple screws must be designed in accordance with Sections 11.2.2 and 12.6 of the NDS-15 (Sections 10.2.2 and 11.6 of the NDS-12 and NDS-05 for the 2012, 2009 and 2006 IBC).

Due to differing pilot hole requirements, fasteners are recognized for use in resisting tension loads only or shear loads only.

When designing a connection, the structural members must be checked for load-carrying capacity in accordance with Section 11.1.2 of NDS-15 (Section 10.1.2 of the NDS-12 for the 2012 IBC and NDS-05 for the 2009 and 2006 IBC), and local stresses within the connection must be checked against Appendix E of the NDS to ensure the capacity of the connection and fastener group.

Use of the Climatek™ coated screws must be limited to typical applications and limitations defined in Table 6. The Climatek™ coated screws are recognized for use in wood treated with waterborne alkaline copper quaternary (ACQ-D) preservatives with a maximum retention of 0.40 pcf (6.4kg/m³) or in wood treated with copper azole (CA-B) preservatives with a maximum retention of 0.40 pcf (6.4kg/m³).

The PHEinox™ stainless steel screws may be used in the applications described in 2015 IBC Section 2304.10.5; 2012, 2009 and 2006 IBC Section 2304.9.5 and IRC Section R317.3 (2006 IRC Section R319.3) where stainless steel fasteners are prescribed.

4.2 Installation:

Screws must be installed in accordance with GRK Canada's published installation instructions and this report. Screws must be installed with the minimum spacing, end distances, and edge distances needed to prevent splitting of the wood or as noted in Table 5, whichever is more restrictive. The screws must be installed with pilot holes that meet the requirements shown in the applicable load tables. The screws must be installed by turning with Star drive bits, not by driving with a hammer.

5.0 CONDITIONS OF USE

The R4™ Multi Purpose Screw, Fin/Trim™ Screw, Kameleon™ Screw and RT Composite™ Screw fasteners described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Installation must comply with this report, the report holder's published instructions and the applicable code. A copy of the report holder's published installation instructions must be available at the jobsite at all times during installation. In the event of a conflict between the published installation instructions and this report, this report governs.
- 5.2 When the capacity of the connection is controlled by the fastener metal strength, rather than wood strength, the metal strength must not be multiplied by the adjustment factors specified in the NDS.
- 5.3 Installation must be limited to connections between wood members used in dry service conditions where the wood moisture content does not exceed 19 percent.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Alternate Dowel-type Threaded Fasteners (AC233), dated April 2015 (editorially revised August 2015).
- 6.2 Data in accordance with the ICC-ES Acceptance Criteria for Corrosion-resistant Fasteners and Evaluation of Corrosion Effects of Wood Treatment Chemicals (AC257), dated October 2009 (editorially revised May 2015).

7.0 IDENTIFICATION

Individual fasteners are identified with a mark indicating the manufacturer. Package labels for these screws include the report holder name (GRK) and address, evaluation report number (ESR-3201), fastener designation (R4™ Multi Purpose Screw, Fin/Trim™ Screw, Kameleon™ Screw or RT Composite™ Screw), fastener size and length, material/coating designation (PHEinox™ or Climatek™), production date and lot number and the compatible treated wood types (0.40 pcf ACQ-D and 0.40 pcf CA-B), where applicable.

TABLE 1B—PHEINOX™ FASTENER SPECIFICATIONS

FASTENER DESIGNATION		OVERALL LENGTH ¹ (inches)	THREAD LENGTH ² (inches)	HEAD DIAMETER (inch)	DRIVER SIZE	ROOT DIAMETER (inch)	SHANK DIAMETER (inch)	OUTSIDE THREAD DIAMETER (inch)	SPECIFIED BENDING YIELD STRENGTH ³ F _{yb} (psi)	ALLOWABLE STEEL STRENGTH	
										Tensile (lbf)	Shear (lbf)
R4	9x2"	2	1 ¹ / ₄	0.329	Star drive T-25	0.112	0.128	0.173	113340	467	334
	10x2 ¹ / ₂ "	2 ¹ / ₂	1 ⁵ / ₈	0.368	Star drive T-25	0.124	0.142	0.193	170220	490	424
	10x2 ³ / ₄ "	2 ³ / ₄	1 ⁷ / ₈								
	10x3 ¹ / ₈ "	3 ¹ / ₈	2 ¹ / ₈								
	10x4"	3 ⁷ / ₈	2 ⁵ / ₈								
	12x2 ¹ / ₂ "	2 ¹ / ₂	1 ⁵ / ₈	0.439	Star drive T-25	0.148	0.171	0.234	159920	681	507
	12x3 ¹ / ₈ "	3 ¹ / ₈	2 ¹ / ₈								
	12x4"	3 ⁷ / ₈	2 ⁵ / ₈								
12x4 ³ / ₄ "	4 ⁵ / ₈	3									
TRIM	8x2 ¹ / ₂ "	2 ¹ / ₂	1 ⁵ / ₈	0.197	Star drive T-10	0.100	0.111	0.156	117540	350	267
	8x2 ³ / ₄ "	2 ³ / ₄	1 ⁷ / ₈								
	8x3 ¹ / ₈ "	3 ¹ / ₈	2 ¹ / ₈								
	9x2 ¹ / ₂ "	2 ¹ / ₂	1 ⁵ / ₈	0.230	Star drive T-15	0.112	0.128	0.175	66340	394	319
	9x2 ³ / ₄ "	2 ³ / ₄	1 ⁷ / ₈								
9x3 ¹ / ₈ "	3 ¹ / ₈	2 ¹ / ₈									

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

¹Overall length of fastener is measured from the top of the head to bottom of the tip. See Figure 1.

²Length of thread includes tip. See detailed illustrations in Figure 1.

³Bending yield strength determined in accordance with ASTM F1575 using the root diameter.

TABLE 2A—CLIMATEK™ COATED FASTENER REFERENCE WITHDRAWAL DESIGN VALUES (W)^{1,2}

[Tabulated Withdrawal Design Values (W) Are in Pounds per Inch of Thread Penetration into Side Grain of Main Member]

FASTENER DESIGNATION	THREAD LENGTH ³ , (inches)	WITHDRAWAL, W (lbs./in.) ³ FOR SPECIFIC GRAVITY =0.67
R4	9x2"	179
	9x2 ¹ / ₂ "	
	9x2 ³ / ₄ "	
	9x3 ¹ / ₈ "	
	10x2 ¹ / ₂ "	249
	10x2 ³ / ₄ "	
	10x3 ¹ / ₈ "	
	10x3 ¹ / ₂ "	
	10x4"	255
	10x4 ³ / ₄ "	
	12x2 ¹ / ₂ "	
	12x2 ³ / ₄ "	
	12x3 ¹ / ₈ "	221
	12x3 ¹ / ₂ "	
	12x4"	
	12x4 ³ / ₄ "	
	12x5 ⁵ / ₈ "	186
	12x6 ³ / ₈ "	
	12x7 ¹ / ₄ "	
	12x8"	
12x10"	175	
12x12"		
TRIM	8x2 ¹ / ₂ "	175
	8x2 ³ / ₄ "	
	8x3 ¹ / ₈ "	
	9x2 ¹ / ₂ "	221
	9x2 ³ / ₄ "	
9x3 ¹ / ₈ "	186	
9x2 ¹ / ₂ "		
9x2 ³ / ₄ "		
KAMELEON	9x2 ¹ / ₂ "	186
	9x2 ³ / ₄ "	
	9x3"	
Pilot hole requirements: 70% of the root diameter of the screw		

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

¹Values must not be multiplied by any adjustment factors.

²Fastener withdrawal was tested in accordance with ASTM D1761.

³Reference withdrawal design values (W) shall be multiplied by the length of thread penetration in the main member (including tip).

TABLE 2B—PHEINOX™ STAINLESS STEEL FASTENER REFERENCE WITHDRAWAL DESIGN VALUES (W)^{1,2}

[Tabulated Withdrawal Design Values (W) Are in Pounds per Inch of Thread Penetration into Side Grain of Main Member]

FASTENER DESIGNATION	THREAD LENGTH ³ , (inches)	WITHDRAWAL, W (lbs./in.) ³ FOR SPECIFIC GRAVITY =0.67
R4	9x2"	213
	10x2 ¹ / ₂ "	123
	10x2 ³ / ₄ "	
	10x3 ¹ / ₈ "	
	10x4"	
	12x2 ¹ / ₂ "	146
	12x3 ¹ / ₈ "	
	12x4"	
	12x4 ³ / ₄ "	
	TRIM	8x2 ¹ / ₂ "
8x2 ³ / ₄ "		
8x3 ¹ / ₈ "		
9x2 ¹ / ₂ "		115
9x2 ³ / ₄ "		
9x3 ¹ / ₈ "		
Pilot hole requirements: 80% of the root diameter of the screw		

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

¹Values must not be multiplied by any adjustment factors.

²Fastener withdrawal was tested in accordance with ASTM D1761.

³Reference withdrawal design values (W) shall be multiplied by the length of thread penetration in the main member (including tip).

**TABLE 3A—CLIMATEK™ COATED FASTENER
REFERENCE PULL-THROUGH
DESIGN VALUES (P)¹**

[Tabulated Pull-Through Design Values (P) are in Pounds]

FASTENER DESIGNATION	MINIMUM SIDE MEMBER THICKNESS (inch)	PULL-THROUGH, P (lbf) FOR SPECIFIC GRAVITY = 0.67
R4	9x2"	162
	9x2 ¹ / ₂ "	
	9x2 ³ / ₄ "	
	9x3 ¹ / ₈ "	
	10x2 ¹ / ₂ "	275
	10x2 ³ / ₄ "	
	10x3 ¹ / ₈ "	
	10x3 ¹ / ₂ "	
	10x4"	
	10x4 ³ / ₄ "	
	12x2 ¹ / ₂ "	407
	12x2 ³ / ₄ "	
	12x3 ¹ / ₈ "	
	12x3 ¹ / ₂ "	
	12x4"	
	12x4 ³ / ₄ "	
	12x5 ⁵ / ₈ "	
	12x6 ³ / ₈ "	
12x7 ¹ / ₄ "		
12x8"		
12x10"		
12x12"		
TRIM	8x2 ¹ / ₂ "	61
	8x2 ³ / ₄ "	
	8x3 ¹ / ₈ "	
	9x2 ¹ / ₂ "	94
	9x2 ³ / ₄ "	
9x3 ¹ / ₈ "		
KAMELEON	9x2 ¹ / ₂ "	143
	9x2 ³ / ₄ "	
	9x3"	
Pilot hole requirements: 90% of the root diameter of the screw		

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

¹Values shall be multiplied by all applicable adjustment factors (see 2015 NDS Table 11.3.1 or 2012 and 2005 NDS Table 10.3.1) as applicable to withdrawal.

**TABLE 3B—PHEINOX™ STAINLESS STEEL FASTENER
REFERENCE PULL-THROUGH
DESIGN VALUES (P)¹**

[Tabulated Pull-Through Design Values (P) are in Pounds]

FASTENER DESIGNATION	MINIMUM SIDE MEMBER THICKNESS (inch)	PULL-THROUGH, P (lbf) FOR SPECIFIC GRAVITY = 0.67
R4	9x2"	184
	10x2 ¹ / ₂ "	220
	10x2 ³ / ₄ "	
	10x3 ¹ / ₈ "	
	10x4"	
	12x2 ¹ / ₂ "	336
	12x3 ¹ / ₈ "	
	12x4"	
12x4 ³ / ₄ "		
TRIM	8x2 ¹ / ₂ "	70
	8x2 ³ / ₄ "	
	8x3 ¹ / ₈ "	
	9x2 ¹ / ₂ "	124
	9x2 ³ / ₄ "	
	9x3 ¹ / ₈ "	
Pilot hole requirements: 90% of the root diameter of the screw		

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

¹Values shall be multiplied by all applicable adjustment factors (see 2015 NDS Table 11.3.1 or 2012 and 2005 NDS Table 10.3.1) as applicable to withdrawal.

**TABLE 4A—CLIMATEK™ COATED FASTENER
REFERENCE LATERAL DESIGN VALUES (Z) FOR SINGLE
SHEAR (TWO-MEMBER) CONNECTIONS^{1,2}**
[For Sawn Lumber with Both Members of Identical Specific Gravity]

FASTENER DESIGNATION	SIDE MEMBER THICKNESS, t_s (inch)	FASTENER PENETRATION, P (inches)	REFERENCE LATERAL DESIGN VALUE, Z (pounds) FOR SPECIFIC GRAVITY OF:	
			0.67 Parallel to Grain, $Z_{ }$	
R4	9x2"	$\frac{3}{4}$	$1\frac{1}{8}$	175
	9x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{1}{2}$	
	9x2 $\frac{3}{4}$ "	$\frac{3}{4}$	2	
	9x3 $\frac{1}{8}$ "	$\frac{3}{4}$	$2\frac{3}{8}$	
	10x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{1}{2}$	203
	10x2 $\frac{3}{4}$ "	$\frac{3}{4}$	2	
	10x3 $\frac{1}{8}$ "	$\frac{3}{4}$	$2\frac{3}{8}$	
	10x3 $\frac{1}{2}$ "	$\frac{3}{4}$	$2\frac{3}{4}$	
	10x4"	$\frac{3}{4}$	$3\frac{1}{8}$	
	10x4 $\frac{3}{4}$ "	$\frac{3}{4}$	$3\frac{7}{8}$	
	12x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{1}{2}$	242
	12x2 $\frac{3}{4}$ "	$\frac{3}{4}$	2	
	12x3 $\frac{1}{8}$ "	$\frac{3}{4}$	$2\frac{3}{8}$	
	12x3 $\frac{1}{2}$ "	$\frac{3}{4}$	$2\frac{3}{4}$	
	12x4"	$\frac{3}{4}$	$3\frac{1}{8}$	
	12x4 $\frac{3}{4}$ "	$\frac{3}{4}$	$3\frac{7}{8}$	
	12x5 $\frac{5}{8}$ "	$\frac{3}{4}$	$4\frac{3}{4}$	
	12x6 $\frac{3}{8}$ "	$\frac{3}{4}$	$5\frac{1}{2}$	
	12x7 $\frac{1}{4}$ "	$\frac{3}{4}$	$6\frac{1}{4}$	
	12x8"	$\frac{3}{4}$	7	
12x10"	$\frac{3}{4}$	9		
12x12"	$\frac{3}{4}$	11		
TRIM	8x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{1}{2}$	84
	8x2 $\frac{3}{4}$ "	$\frac{3}{4}$	2	
	8x3 $\frac{1}{8}$ "	$\frac{3}{4}$	$2\frac{1}{2}$	
	9x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{1}{2}$	104
	9x2 $\frac{3}{4}$ "	$\frac{3}{4}$	2	
	9x3 $\frac{1}{8}$ "	$\frac{3}{4}$	$2\frac{3}{8}$	
KAMELEON	9x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{5}{8}$	159
	9x2 $\frac{3}{4}$ "	$\frac{3}{4}$	$1\frac{7}{8}$	
	9x3"	$\frac{3}{4}$	$1\frac{7}{8}$	
Pilot hole requirements: 90% of the root diameter of the screw				

For **SI**: 1 inch = 25.4 mm.

¹Values shall be multiplied by all applicable adjustment factors (see 2015 NDS Table 11.3.1 or 2012 and 2005 NDS Table 10.3.1).

²Lateral load testing was performed in accordance with ASTM D1761.

**TABLE 4B—PHEINOX™ STAINLESS STEEL FASTENER
REFERENCE LATERAL DESIGN VALUES (Z) FOR SINGLE
SHEAR (TWO-MEMBER) CONNECTIONS^{1,2}**
[For Sawn Lumber with Both Members of Identical Specific Gravity]

FASTENER DESIGNATION	SIDE MEMBER THICKNESS, t_s (inch)	FASTENER PENETRATION, P (inches)	REFERENCE LATERAL DESIGN VALUE, Z (pounds) FOR SPECIFIC GRAVITY OF:		
			0.67 Parallel to Grain, $Z_{ }$		
R4	9x2"	$\frac{3}{4}$	$1\frac{1}{8}$	212	
	10x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{1}{2}$	235	
	10x2 $\frac{3}{4}$ "	$\frac{3}{4}$	2		
	10x3 $\frac{1}{8}$ "	$\frac{3}{4}$	$2\frac{3}{8}$		
	10x4"	$\frac{3}{4}$	$3\frac{1}{8}$	328	
	12x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{5}{8}$		
	12x3 $\frac{1}{8}$ "	$\frac{3}{4}$	$2\frac{3}{8}$		
	12x4"	$\frac{3}{4}$	$3\frac{1}{8}$		
	TRIM	12x4 $\frac{3}{4}$ "	$\frac{3}{4}$	$3\frac{7}{8}$	78
		8x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{5}{8}$	
8x2 $\frac{3}{4}$ "		$\frac{3}{4}$	2		
8x3 $\frac{1}{8}$ "		$\frac{3}{4}$	$2\frac{3}{8}$	108	
9x2 $\frac{1}{2}$ "		$\frac{3}{4}$	$1\frac{5}{8}$		
9x2 $\frac{3}{4}$ "		$\frac{3}{4}$	2		
RT COMPOSITE	9x3 $\frac{1}{8}$ "	$\frac{3}{4}$	$2\frac{3}{8}$	107	
	8x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{1}{2}$		
	8x2 $\frac{3}{4}$ "	$\frac{3}{4}$	2		
	8x3 $\frac{1}{8}$ "	$\frac{3}{4}$	$2\frac{3}{8}$	151	
	9x2 $\frac{1}{2}$ "	$\frac{3}{4}$	$1\frac{1}{2}$		
	9x2 $\frac{3}{4}$ "	$\frac{3}{4}$	2		
9x3 $\frac{1}{8}$ "	$\frac{3}{4}$	$2\frac{3}{8}$			
Pilot hole requirements: 90% of the root diameter of the screw					

For **SI**: 1 inch = 25.4 mm.

¹Values shall be multiplied by all applicable adjustment factors (see 2015 NDS Table 11.3.1 or 2012 and 2005NDS Table 10.3.1).

²Lateral load testing was performed in accordance with ASTM D1761.

TABLE 5—CONNECTION GEOMETRY REQUIREMENTS^{1,2}

CONDITION		MINIMUM DISTANCE OR SPACING (inches)			
		D = 0.111"	D = 0.128-0.134"	D = 0.142"	D = 0.171"
End distance	Loading toward end	2	2	2 ¹ / ₈	2 ⁵ / ₈
	Loading away from end	1 ¹ / ₈	1 ¹ / ₄	1 ³ / ₈	1 ³ / ₄
	Loading perpendicular to grain	NA ³	NA ³	NA ³	NA ³
Edge distance	Loading parallel to grain	1	1	1 ¹ / ₈	1 ³ / ₈
	Loading perpendicular to grain	NA ³	NA ³	NA ³	NA ³
Spacing between fasteners in a row	Loading parallel to grain	1 ³ / ₄	2	2 ¹ / ₈	2 ⁵ / ₈
	Loading perpendicular to grain	NA ³	NA ³	NA ³	NA ³
Spacing between rows	In-line rows	⁵ / ₈	⁵ / ₈	³ / ₄	⁷ / ₈
	Staggered rows ⁴	¹ / ₄	³ / ₈	³ / ₈	³ / ₈

For SI: 1 inch = 25.4 mm.

¹ End distances, edge distances and screw spacing must be sufficient to prevent splitting of the wood, or as required by this table, whichever is the more restrictive. See Section 4.2.

² The term *D* is the shank diameter, as specified in Table 1.

³ Loading perpendicular to grain is outside the scope of this evaluation report.

⁴ Values for spacing between staggered rows apply where screws in adjacent rows are offset by half of the spacing between screws in a row.

TABLE 6—EXPOSURE CONDITIONS FOR FASTENERS WITH INTENDED USE AND LIMITATIONS OF RECOGNITION

EXPOSURE CONDITION	TYPICAL APPLICATIONS	RECOGNITION LIMITATIONS
Corrosion Resistance of Fasteners		
1	Treated wood in dry use applications	Limited to use where equilibrium moisture content of the chemically treated wood meets the dry service conditions as described in the NDS.
3	General construction	Limited to freshwater and chemically treated wood exposure, i.e., no saltwater exposure.

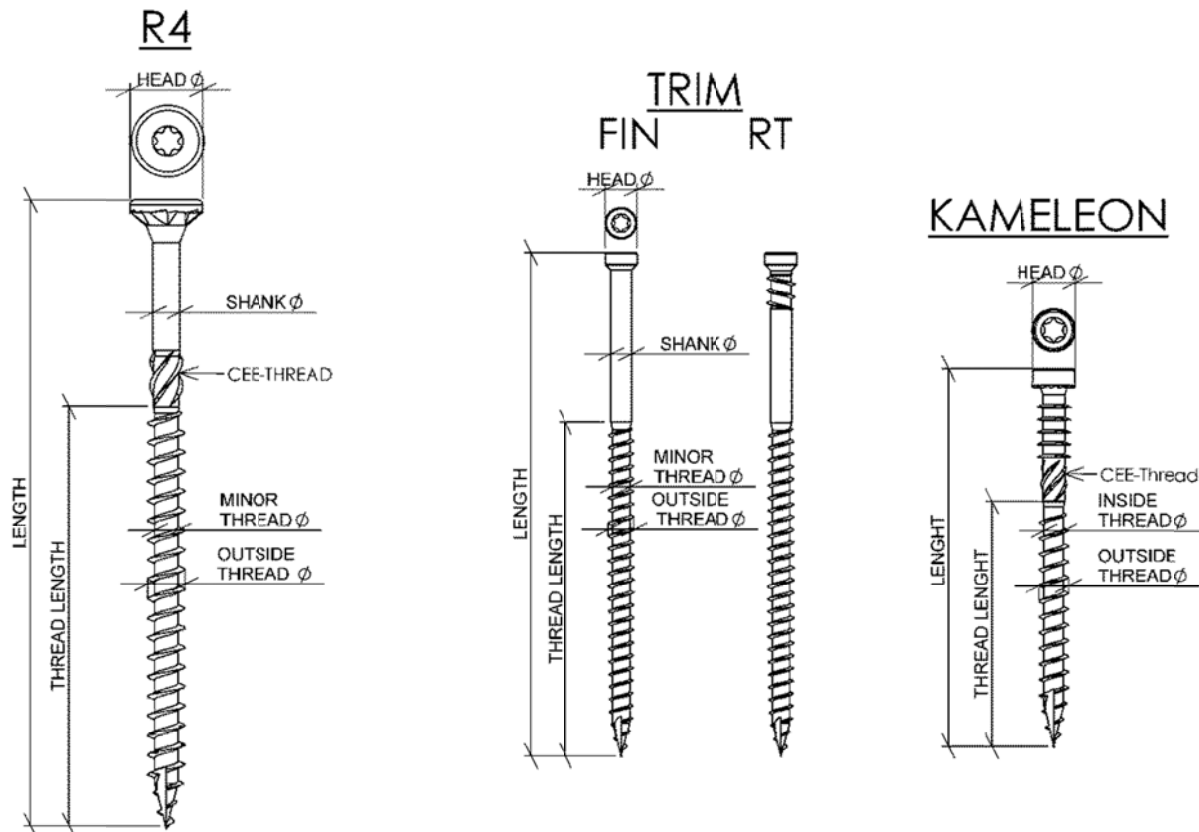


FIGURE 1—GRK SCREWS