



### AutoTight<sup>®</sup> Rod

AutoTight uses a continuous threaded rod. Typical lengths are 2', 3', 6', 10', and 12'. Field cut if needed. Rod may be ordered custom cut with sufficient lead time.

#### Material Identification: R (Rod) + Dia. (1/8's of an inch) + Alloy

**Examples:** R5-A307 = 5/8"-11 NC threaded rod, ASTM A307 Steel (Standard Strength)  
R9-B7 = 1-1/8"-7 NC threaded rod, ASTM A193-B7 Steel (High Strength)

**Finish:** **Standard** Black or zinc plated. **Optional** Hot Dip Galvanized (HDG)

**Note: HDG rod must be chased to fit standard nuts & couplers.** Or use special nuts and couplers.

**Diameter and Thread:** Rod is available from 1/2" (R4) to 2" (R16) diameter. Thread is Unified National Coarse (NC or UNC). Other sizes, material and lengths are available.

**Strength:** Rod Strength is per AISC 360 and ICC AC 391-3.2.1.1. Rod strength and elongation are identical for all suppliers (per AISC 360). **Some suppliers overstate strength and understate elongation. Please check!**

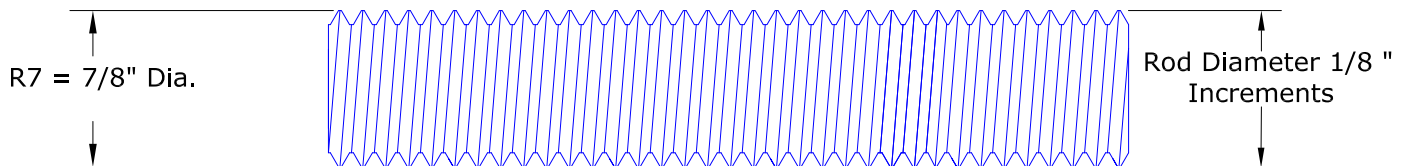
**Elongation:** Elongation for each (10') rod is shown at the maximum allowable tension load per ICC AC 391-3.2.1.1, Eq. 1. Adjust elongation based: on design load and distance between reaction points.

**Code Acceptance:** Tensile Values per IBC 2012, IBC 2009, IBC 2006 And AISC 360 13th edition.

### Rod Basics

**Rod** is specified by grade, diameter and length.

**Rod diameter** is specified by the diameter in 1/8" increments. A 7/8" diameter rod is specified as R7.



### Calculating Elongation

Both rod strength and elongation are critical to shear wall performance. Lower rod elongation results in lower shear wall drift and better performance. Rod is a major contributor to total system elongation. The fastest manual method of determining rod strength and elongation is to use a rod table and adjust to actual conditions.

When using a rod table: 1. select the rod for strength; 2. calculate rod elongation at the required load and rod length. 3. compare the elongation to requirements. 4. increase rod diameter to reduce elongation.

**Example:** Required Strength 11 kips. Floor Height (carpet-to-carpet) 11' - 4" (136").

**Solution: #1 A307 Rod.** Select an R7-A307 Rod from the AutoTight Rod table. This is a 7/8"Ø A307 rod with a Strength Capacity = 13,530 pounds, Elongation = 0.121" (for a 10' (120") length).  
Calculated adjusted elongation: =  $11,000/13,530 * 136"/120" * 0.121" = \mathbf{0.1115"}$

**Solution: #2 B7 Rod.** Select an R5-B7 Rod from the AutoTight Rod table. This rod is 5/8"Ø- B7 rod with a Strength Capacity = 14,380 pounds, Elongation = 0.263" for a 10' (120") length.  
Calculate adjusted elongation =  $11,000/14,380 * 136"/120" * 0.263" = \mathbf{0.2280"}$



### AutoTight Rod (ASD Allowable Load per AISC 360)

**Standard Strength**

Diameter & Thread	Rod Size & Alloy	A307		Rod Size & Alloy	F1554 Grade 55	
	Model	Allowable Tension (lb)	Elong in per 10'	Model	Allowable Tension (lb)	Elong in per 10'
1/2"-13 UNC	R4-A307	4,418	0.129	R4-G55	5,522	0.161
5/8"-11 UNC	R5-A307	6,903	0.126	R5-G55	8,629	0.158
3/4"-10 UNC	R6-A307	9,940	0.123	R6-G55	12,425	0.154
7/8"-9 UNC	R7-A307	13,530	0.121	R7-G55	16,912	0.152
1"-8 UNC	R8-A307	17,672	0.121	R8-G55	22,089	0.151
1-1/8"-7 UNC	R9-A307	22,365	0.121	R9-G55	27,957	0.152
1-1/4"-7 UNC	R10-A307	27,612	0.118	R10-G55	34,515	0.147
1-3/8"-6 UNC	R11-A307	33,410	0.120	R11-G55	41,763	0.150
1-1/2"-6 UNC	R12-A307	39,761	0.117	R12-G55	49,701	0.146
1-3/4"-5 UNC	R14-A307	54,119	0.118	R14-G55	67,649	0.147
2"-4.5 UNC	R16-A307	70,686	0.117	R16-G55	88,357	0.146

**High Strength**

Diameter & Thread	Rod Size & Alloy	C1045		Rod Size & Alloy	A193-B7, F1554 Gr 105	
	Model	Allowable Tension (lb)	Elong in per 10'	Model	Allowable Tension (lb)	Elong in per 10'
1/2"-13 UNC	R4-C1045	8,836	0.258	R4-B7	9,204	0.268
5/8"-11 UNC	R5-C1045	13,806	0.253	R5-B7	14,381	0.263
3/4"-10 UNC	R6-C1045	19,880	0.246	R6-B7	20,709	0.256
7/8"-9 UNC	R7-C1045	27,059	0.242	R7-B7	28,187	0.253
1"-8 UNC	R8-C1045	35,343	0.241	R8-B7	36,816	0.251
1-1/8"-7 UNC	R9-C1045	44,731	0.242	R9-B7	46,595	0.253
1-1/4"-7 UNC	R10-C1045	55,223	0.236	R10-B7	57,524	0.246
1-3/8"-6 UNC	R11-C1045	66,820	0.239	R11-B7	69,604	0.249
1-1/2"-6 UNC	R12-C1045	79,522	0.234	R12-B7	82,835	0.244
1-3/4"-5 UNC	R14-C1045	108,238	0.236	R14-B7	112,748	0.246
2"-4.5 UNC	R16-C1045	141,372	0.234	R16-B7	147,262	0.244

**Super Strength**

Diameter & Thread	Rod Size & Alloy	A354 BD	
	Model	Allowable Tension (lb)	Elong in per 10'
1-1/8"-7 UNC	R9-A654BD	55,910	0.303
1-1/4"-7 UNC	R10-A654BD	69,030	0.295



High strength rod is typically identified with a high strength mark. The actual identification varies by specific supplier. Consult factory for more information.

**Notes:**

- Material Properties: (Other grades available, consult factory)  
 ASTM A307 Fu = 60, Fy = 43 ksi.    ASTM F1554 Gr. 55, Fu=75, Fy =55 ksi.    ASTM A108-C1045 Fu = 120, Fy = 92  
 ASTM A193-B7, Fu=125, Fy=105 ksi.    ASTM F1554 Gr. 105, Fu=125, Fy=105 ksi.    ASTM A354-BD Fu = 150, Fy = 130 ksi.
- Strength P = 0.75 x Fu x nominal area / 2 Per AISC 360 13th ed Table 7.2, pg. 7-2, P16.1-108 Eqn J3-1
- Stress increase not allowed with AISC 13th Ed capacities. (IBC 2006 & later)
- Rod stretch calculated per AC391 3.2.1.1 as follows:  
 $\Delta Rod = PL/AnE$  where: P=Load, L=length, An=0.7854 (D-0.9743/n)<sup>2</sup>,  
 D = nominal rod dia, n = threads per inch, E = elastic modulus = 29,000,000.  
 Table elongation is 10' rod at allowable load. Depending on jurisdiction stretch limit may be 1/8", 0.179", 0.200", or not specified.  
 Elongation of other length rods may be calculated from this table by length ratio.
- Large Ø rod (1-3/8" to 2" Ø) used for stretch reduction. Consult factory for advice before using.
- Tabulated allowable loads are ASD for IBC 2006, 2009 & 2012, CBC 2007 & 2010, OSSC 2007 & 2010, LABC 2008 & 2011.
- LRFD Strengths are 1.5 x ASD Allowable Loads.