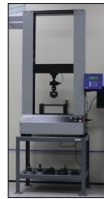


**PULLOUT**

Because the tensile strength of the substrate dramatically affects the pullout of the fastener, TFC provides published pullout results based on a calculation developed by AISI and **The Aluminum Association Aluminum Design Manual**

The following pullout loads were calculated per AISI S100 | Section 4 of the Supplement No. 2 to the American Specification for the Design of Cold-Form Steel Structural members (S100-07/S2-10).

Many tests were conducted with compressible fiberglass insulation placed between steel sheet samples. It was determined by the results that the equations are valid for steel connections including applications that use compressible insulation. Refer to AISI S100 for more details.



- The pullout calculation requires the use of the nominal diameter of the screw and the tensile strength of the substrate.
- Because substrate tensile and specific fastener details like point diameter affects pullout loads, these pullout loads are conservative.

**For tested values, contact Triangle Fastener to conduct actual pullout tests based on a specific fastener style and the tensile strength requirement of the substrate.**

**PULLOUT LOADS | ULTIMATE IN POUNDS** (Carbon Steel, 304 Stainless Steel & 410 Stainless Steel Screws)

The tensile strength of the substrate that is used in the chart below is typical for metal building and roofing applications. Contact TFC if other substrate tensile strengths are required.

**STEEL**

Fastener Information		PULLOUT   ULTIMATE LOAD IN POUNDS Calculated Values In Accordance to AISI S100   Section E4										
Screw Size	Nom Dia. (in.)	Grade 50 per ASTM A1011 60Ksi Min. Steel		Grade 50 per ASTM A792/A653/A572/A529 65Ksi Min. Steel								
		22 Ga. (.030")	20 Ga. (.036")	18 Ga. (.048")	16 Ga. (.060")	14 Ga. (.075")	12 Ga. (.105")	1/8" (.125")	10 ga (.135")	1/4" (.250")	3/8" (.375")	1/2" (.500")
#10-16	.190"	291	349	504	627	786	1,101	1,311				
#12-14	.216"	330	397	573	716	895	1,253	1,492	1,611	2,984	*4,475	*5,967
1/4-14	.250"	383	459	633	829	1,036	1,450	1,727	1,865	3,453		
1/4-20	.250"							1,727	1,865	3,453	*5,180	*6,906

\* Denotes load exceeds tensile strength of screw.

**ALUMINUM | 6063-T5**

Fastener Information			PULLOUT   ULTIMATE LOAD IN POUNDS Calculated per The Aluminum Association Aluminum Design Manual					
Screw Size	Nom Dia. (in.)	Tensile	Grade 6063 - T5 (27Ksi Tensile - 21Ksi Yield)					
			.030"	.040"	.050"	.125"	.250"	.375"
#10-16	.190"	950 <sup>1</sup>	161	201	242	599	2090	3582*
#12-14	.216"	1135 <sup>1</sup>	183	229	275	680	2231	3928*
1/4-14	.250"	2138 <sup>2</sup>	212	265	318	788		
1/4-20	.250"	2413 <sup>2</sup>					2583	4546*

\* Denotes load exceeds tensile strength of screw.

<sup>1</sup> Per ICCES ESR-4009 (Ejot)  
<sup>2</sup> Per CCRR-0387 (SFS)

Fastener Information		Screw Strengths (Ultimate)	
Screw Size	Nom Dia. (in.)		
		Tension	Shear
#10-16	.190"	950 <sup>1</sup>	695 <sup>1</sup>
#12-14	.216"	1135 <sup>1</sup>	875 <sup>1</sup>
1/4-14	.250"	2138 <sup>2</sup>	1703 <sup>2</sup>
1/4-20	.250"	2413 <sup>2</sup>	1803 <sup>2</sup>

<sup>1</sup> Per ICCES ESR-4009 (Ejot)  
<sup>2</sup> Per CCRR-0387 (SFS)

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**REPORTS**

ICCES ESR-4009 (Ejot)  
CCRR-0387 (SFS)

**MATERIAL**

Body: 304 Stainless Steel  
Drill Tip: Carbon Steel

**PLATING**

#10 & #12 Dia.: Zinc and Wax  
1/4" Dia.: Zinc with TRI-SEAL Topcoat  
Salt Spray Per ASTM B117 - > 2,000 Hrs

For allowable loads, please apply an appropriate Factor of Safety as required by local and national code requirements. AISI S100 Section E4 recommends a Factor of Safety of 3 for allowable loads.

All information is non-binding and without guarantee. Before using the products, all specifications and calculations must be checked by a suitably qualified person and local regulations must be observed. This document is subject to revision. We reserve the right to make technical changes. (0321-1)