



Grip-Twist[®]

TTGT DoughNUT[™]

**THREADED END
ANCHORAGES FOR
REINFORCING BARS**



PERFORMANCE TEST DATA

APRIL 2024

**Barsplice Products, Inc. • 4900 Webster Street • Dayton OH 45414, USA
Tel: (937) 275-8700 • e-mail: bar@barsplice.com • www.barsplice.com**

Copyright© 2024, Barsplice Products, Inc., "BPI" • All rights reserved

INTRODUCTION

Barsplice Products, Inc. has conducted a series of in-air tests on the Taper Threaded Grip-Twist® (TTGT) DoughNUT™ system of reinforcing bar mechanical end anchorages, sizes No. 4 through No. 18. The purpose of this testing is to ensure that they are manufactured to the quality standards of BPI's ISO 9001 Quality System and are capable of exceeding strength requirements of various Building Codes.

Two head diameter designs are available, depending on application requirements, and test results for both are included. Heads with a cross-sectional area exceeding 5x the rebar area (TDS) are designated as 5Ab and heads with a cross-sectional area exceeding 10x the rebar area (TDX) are designated as 10Ab.

TENSILE TEST PROCEDURE

Test specimens were loaded monotonically in tension to failure to determine the capability of the TTGT DoughNUT™ headed bar system. The tests were conducted in accordance with ASTM A370 (Standard Test Methods and Definitions for Mechanical Testing of Steel Products) and ASTM A1034 (Standard Test Methods for Testing Mechanical Splices for Steel Reinforcing Bars). Loads were applied through the bearing area of the head. The testing was performed to exceed the mechanical anchorage strength requirements of ACI (American Concrete Institute) 318-19 Section 25.4.5.1 and ASTM A970, Class A & Class HA.

All monotonic tension tests were carried out in a 600 kip Forney universal testing machine, located at the Barsplice manufacturing facility. Current calibration certificates for the test machine are on file.

The reinforcing steel used in these tests conforms to the requirements of ASTM A615, Grade 60 and ASTM A706, Grade 60.

TEST RESULTS

Results of the TTGT DoughNUT™ tension testing described above are summarized in Table 1 and represented in Chart 1.

SUMMARY

Tension test specimens exceeded the strength requirements of ACI 318-19*, namely 100% x specified yield strength of Grade 60 reinforcement, or 60,000 psi (420 MPa).

Additionally, the tension test specimens exceeded the strength requirements stated in ASTM A970, Class A and Class HA, namely the specified tensile strength of Grade 60 bar, or 80,000 psi (550 MPa).

* In meeting the strength requirements of ACI-318, the TTGT DoughNUT™ system complies with IBC 2021 Section 1901.2.

TABLE 1: TTGT DoughNUT™ TENSILE TEST RESULTS

BAR SIZE	HEAD TYPE	TEST LAB ID # & REF #		PEAK STRENGTH	
				MAX STRESS (psi)	% GR. 60 SPEC. TENSILE
No. 4	TDS 5Ab	4T465	4A	106,700	133%
			4B	103,850	130%
		4T2353	4A	105,600	132%
			4B	104,000	130%
	4T2670	4A	122,200	153%	
		4B	121,100	151%	
	TDX 10Ab	4T387*	4A	96,425	121%
		4T4538	4A	107,469	134%
4B	108,633		136%		
No. 5	TDS 5Ab	5T624	5A	113,670	142%
			5B	113,926	142%
		5T1047	5A	106,129	133%
			5B	107,419	134%
	5T6659	5A	108,484	136%	
		5B	108,226	135%	
	TDX 10Ab	5T806*	5A	93,629	117%
		5T13267	5A	109,333	137%
5B	111,548		139%		
No. 6	TDS 5Ab	6T571A	6A	111,495	139%
			6B	110,618	138%
		6T611A	6A	106,640	133%
			6B	107,312	134%
	6T1024	6A	108,864	136%	
		6B	113,614	142%	
	TDX 10Ab	6T1023	6A	111,205	139%
			6B	109,250	137%
6T7846	6A	121,320	152%		
	6B	122,314	153%		
No. 7	TDS 5Ab	7T285	7A	111,025	139%
			7B	112,161	140%
		7T312	7A	105,249	132%
			7B	106,497	133%
	7T1860	7A	106,467	133%	
		7B	111,767	140%	
	TDX 10Ab	7T1883	7A	111,633	140%
			7B	112,283	140%
No. 8	TDS 5Ab	8T3161	8A	107,405	134%
			8B	106,367	133%
		8T3604	8A	109,177	136%
			8B	110,316	138%
	8T3816	8A	114,203	143%	
		8B	113,937	142%	
	TDX 10Ab	8T3187	8A	117,000	146%
			8B	113,785	142%
8T5125	8A	115,044	144%		
	8B	114,428	143%		

* Test conducted on ASTM A706 reinforcement bar

BAR SIZE	HEAD TYPE	TEST LAB ID # & REF #		PEAK STRENGTH	
				MAX STRESS (psi)	% GR. 60 SPEC. TENSILE
No. 9	TDS 5Ab	9T1314*	9A	98,530	123%
			9A	108,690	136%
		9T1844	9B	106,480	133%
			9A	111,760	140%
		9T2314	9B	112,180	140%
			9A	114,163	143%
	9T3119	9B	113,953	142%	
		TDX 10Ab	9T1792	9A	117,030
	9B			116,560	146%
	9T2286		9A	106,900	134%
9B			112,090	140%	
No. 10	TDS 5Ab	10T1260	10A	108,764	136%
			10B	109,630	137%
		10T2178	10A	108,480	136%
			10B	104,472	131%
		10T2644	10A	112,680	141%
			10B	111,492	139%
	TDX 10Ab	10T2066	10A	105,087	131%
			10B	106,260	133%
	10T2777	10A	117,393	147%	
		10B	114,018	143%	
No. 11	TDS 5Ab	11T3991	11A	110,058	138%
			11B	109,641	137%
		11T4083	11A	104,487	131%
			11B	103,513	129%
	11T5671	11A	108,898	136%	
		11B	110,239	138%	
	TDX 10Ab	11T4196	11A	108,756	136%
			11B	108,192	135%
11T5682	11A	109,542	137%		
	11B	111,227	139%		
No. 14	TDS 5Ab	14T685	14A	107,769	135%
			14B	105,249	132%
		14T888	14A	113,116	141%
			14B	114,107	143%
	TDX 10Ab	14T178*	14A	95,250	119%
			14B	95,327	119%
14T925*	14A	100,009	125%		
No. 18	TDS 5Ab	18T403	18A	104,630	131%
			18B	105,358	132%
		18T509	18A	113,682	142%
			18B	112,040	140%
	TDX 10Ab	18T190*	18A	98,293	123%
			18B	98,690	123%
		18T704	18A	97,780	122%
			18B	98,232	123%
18T1083	18A	107,227	134%		

CHART 1: TTGT DoughNUT™ TENSILE TEST RESULTS

