



# BarSplicer

## DoughNUT™

**THREADED END ANCHORAGES  
FOR GRADE 60 REINFORCING BARS**



## PERFORMANCE TEST DATA

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## INTRODUCTION

Barsplice Products, Inc. has conducted a series of in-air tests on the BPI® Barsplicer DoughNUT™ system of reinforcing bar mechanical end anchorages, sizes No. 4 through No. 11. 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 various Building Code strength requirements.

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 (TERM) are designated as 5Ab and heads with a cross-sectional area exceeding 10x the rebar area (DNX) are designated as 10Ab.

## TENSILE TEST PROCEDURE

Test specimens were loaded monotonically in tension to failure to determine the capability of the Barsplicer 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 on a 600 kip Forney universal testing machine, or a 900 kip MTS universal test machine, located at the Barsplice manufacturing facility. Current calibration certificates for the test machine(s) are on file.

The reinforcing steel used in these tests conforms to the requirements of ASTM A615, Grade 60 and ASTM A706, Grade 60. Both uncoated and epoxy coated reinforcing steel and matching Barsplicer DoughNUT™ heads were tested.

## TEST RESULTS

Results of the Barsplicer 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, specifically 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, specifically 80,000 psi (550 MPa).

\* In meeting the strength requirements of ACI-318, the Barsplicer DoughNUT™ system complies with IBC 2018 Section 1901.2.

**TABLE 1: BARSPLICER DoughNUT™ TENSILE TEST RESULTS**

BAR SIZE	TEST LAB ID # & REF #		PEAK STRENGTH	
			MAX STRESS (psi)	% GR. 60 SPEC. TENSILE
No. 4	4T1226	4A	98,050	123%
		4B	95,700	120%
	4T2108	4A	101,000	126%
		4B	100,650	126%
	4T2261	4A	100,900	126%
		4B	99,000	124%
	4T3921 EPOXY	4A	106,850	134%
		4B	107,000	134%
No. 5	5T1121	5A	102,806	129%
		5B	102,484	128%
	5T6848 EPOXY	5A	106,323	133%
		5B	107,516	134%
	5T7302 EPOXY	5A	99,065	124%
		5B	96,387	120%
	5T7912	5A	100,581	126%
		5B	101,387	127%
5T11984 (DNX, 10Ab)	5A	107,845	135%	
	5B	106,607	133%	
No. 6	6T2281	6A	99,955	125%
		6B	100,227	125%
	6T2469	6A	97,773	122%
		6B	107,500	134%
	6T5472	6A	105,273	132%
		6B	101,864	127%
	6T5571 EPOXY	6A	104,841	131%
		6B	104,205	130%
6T7631 (DNX 10Ab)	6A	105,900	132%	
	6B	108,047	135%	
No. 7	7T1333	7A	106,100	133%
		7B	106,400	133%
	7T1504 EPOXY	7A	105,733	132%
		7B	105,850	132%
	7T1791 EPOXY	7A	102,883	129%
		7B	99,200	124%
	7T2043	7A	104,533	131%
		7B	105,633	132%
7T2188*	7A	94,183	118%	

BAR SIZE	TEST LAB ID # & REF #		PEAK STRENGTH	
			MAX STRESS (psi)	% GR. 60 SPEC. TENSILE
No. 8	8T1401	8A	108,139	135%
		8B	108,481	136%
	8T1813	8A	100,658	126%
		8B	103,696	130%
	8T2502 EPOXY	8A	98,595	123%
		8B	98,772	123%
	8T3049*	8A	97,418	122%
	8T3270 EPOXY	8A	102,329	128%
8B		101,797	127%	
8T5241 (DNX, 10Ab)	8A	108,216	135%	
	8B	107,206	134%	
No. 9	9T1120	9A	109,910	137%
		9B	109,930	137%
	9T1831 EPOXY	9A	98,180	123%
		9B	98,710	123%
	9T2131 EPOXY	9A	105,050	131%
		9B	103,930	130%
9T2732 (DNX, 10Ab)	9A	111,090	139%	
	9B	111,690	140%	
No. 10	10T1062	10A	102,315	128%
		10B	102,882	129%
	10T1334	10A	104,102	130%
		10B	104,677	131%
	10T1856	10A	101,772	127%
		10B	102,205	128%
	10T1894*	10A	97,535	122%
10T1942	10A	99,690	125%	
	10B	102,330	128%	
No. 11	11T2411	11A	99,263	124%
		11B	99,449	124%
	11T2527	11A	102,923	129%
		11B	102,962	129%
	11T3177 EPOXY	11A	98,718	123%
		11B	98,071	123%
	11T3606*	11A	95,981	120%
	11T3920 EPOXY	11A	100,045	125%
11B		100,981	126%	
11T5133 (DNX, 10Ab)	11A	103,923	130%	
	11B	100,821	126%	

\* Test conducted on ASTM A706 reinforcement bar

# CHART 1: BARSPLICER DoughNUT™ TENSILE TEST RESULTS

