



Barsplice
PRODUCTS INC.

A SUBSIDIARY OF FC INDUSTRIES INC.

Zap Screwlok[®]

FX Series

**SHEAR SCREW & WEDGE
MECHANICAL CONNECTIONS
FOR GRADE 80 & GRADE 100
UNCOATED AND EPOXY
REINFORCING BARS**



PERFORMANCE TEST DATA

OCTOBER 2020

Barsplice Products, Inc. • 4900 Webster Street • Dayton OH 45414, USA

Tel: (937) 275-8700 • Fax: (937) 275-9566 • e-mail: bar@barsplice.com

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INTRODUCTION

Barsplice Products, Inc. (BPI) have conducted a series of tests on reinforcing bar mechanical splices, sizes No. 4 through No. 18. The tests have been conducted on uncoated and epoxy coated Zap Screwlok® FX Mechanical Splices. The purpose of the testing is to ensure that products are manufactured to the quality standards of BPI's ISO 9001 Quality System and are capable of exceeding strength requirements of various Building Codes.

TENSILE TEST PROCEDURE

Test specimens were loaded monotonically in tension to failure to determine the capability of the splice 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." The testing was performed to exceed the strength requirements of ACI (American Concrete Institute) 318-19, Chapter 25 using Grade 80 AND Grade 100 reinforcing bar.

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 A706, Grade 80 and ASTM A1035, Grade 100.

TEST RESULTS

Results of the Zap Screwlok® FX tension testing described above are summarized in Table 1 and represented in Chart 1.

SUMMARY

Tension test specimens exceeded the Type 1 strength requirements of ACI 318-19, Chapter 25, namely 125% x specified yield strength of ASTM A615 and A706 Grade 80 rebar or 100,000 psi (690 MPa) and 125% x specified yield strength of ASTM A1035 Grade 100 rebar or 125,000 psi (860 MPa).

Tension test specimens exceeded 100% x specified tensile strength of ASTM A615 and A706 Grade 80 rebar, specifically 100,000 psi (690 MPa), which is equivalent to 133% x specified yield.

TABLE 1: ZAP SCREWLOK® FX TENSILE TEST RESULTS

BAR SIZE	BAR GR.	TEST LAB ID # & REF #		PEAK STRENGTH			
				MAX STRESS (psi)	% GR. 80 SPEC. YIELD	% GR. 100 SPEC. YIELD	
No. 4	100	4T638	4A	165,200	207%	165%	
			4B	155,350	194%	155%	
	100	4T2286	4A	155,400	194%	155%	
			4B	161,150	201%	161%	
	100	4T3066	4A	172,750	216%	173%	
			4B	170,700	213%	171%	
	100	4T3073	4A	158,700	198%	159%	
			4B	159,900	200%	160%	
	100	4T3663*	4A	162,100	203%	162%	
	100	4T3828	4A	157,150	196%	157%	
4B			157,950	197%	158%		
No. 5	100	5T1127	5A	175,742	220%	176%	
	100	5T2624	5A	172,581	216%	173%	
	100	5T8681	5A	175,742	220%	176%	
			5B	172,581	216%	173%	
	100	5T9777	5A	157,742	197%	158%	
			5B	157,161	196%	157%	
	100	5T10070	5A	141,613	177%	142%	
			5B	156,387	195%	156%	
	100	5T10837	5A	165,968	207%	166%	
			5B	159,000	199%	159%	
No. 6	100	6T4957	6A	147,136	184%	147%	
	100	6T5973	6A	151,795	190%	152%	
	100	6T6093	6A	144,114	180%	144%	
	100	6T6357	6A	164,386	205%	164%	
	100	6T6547	6A	147,023	184%	147%	
	100	6T6630	6A	163,886	205%	164%	
	100	6T6825	6A	165,386	207%	165%	
	100	6T6930	6A	158,795	198%	159%	
No. 7	100	7T1807	7A	157,117	196%	157%	
			7B	160,567	201%	161%	
	100	7T1968	7A	162,917	204%	163%	
			7B	168,150	210%	168%	
	100	7T2009	7A	152,333	190%	152%	
	100	7T2560	7A	166,917	209%	167%	
			7B	166,233	208%	166%	
	100	7T3294	7A	166,492	208%	166%	
	100	7T3340	7A	163,832	205%	164%	
	100	7T3464	7A	164,073	205%	164%	
No. 8	100	8T1977	8A	158,228	198%	158%	
			8B	158,481	198%	158%	
			8C	158,316	198%	158%	
	80*	8T2584	8A	105,937	132%	-	
	100	8T4166	8A	163,577	204%	164%	
	100	8T4192	8A	166,052	208%	166%	
	100	8T4324	8A	159,966	200%	160%	
	100	8T4352	8A	168,108	210%	168%	
	No. 9	100	9T568	9A	154,400	193%	154%
				9B	165,300	207%	165%
100		9T1747	9A	162,500	203%	163%	
			9B	156,860	196%	157%	
100		9T2359	9A	163,108	204%	163%	
			9B	173,908	217%	174%	
100		9T2364	9A	169,456	212%	169%	
100		9T2404	9A	176,226	220%	176%	
100	9T2495	9A	173,343	217%	173%		
100	9T2654	9A	174,039	218%	174%		
No. 10	100	10T1410	10A	164,354	205%	164%	
			10B	154,622	193%	155%	
	100	10T1417	10A	165,693	207%	166%	
			10B	164,732	206%	165%	
			10C	166,331	208%	166%	
	100	10T1871	10A	159,686	200%	160%	
	100	10T2240	10A	160,738	201%	161%	
	100	10T2424	10A	167,651	210%	168%	
	100	10T2471	10A	163,646	205%	164%	
	100	10T2481	10B	162,156	203%	162%	
No. 11	80*	11T3645	11A	110,112	138%	-	
			11B	110,320	138%	-	
	100	11T4177	11A	163,456	204%	163%	
			11B	164,286	205%	164%	
	80*	11T4201	11A	112,885	141%	-	
	100	11T4317	11A	159,782	200%	160%	
	100	11T4356	11A	161,667	202%	162%	
	100	11T4454	11A	156,182	195%	156%	
	100	11T4618	11A	166,157	208%	166%	
	100	11T4717	11A	164,953	206%	165%	

* Test conducted on ASTM A706 Grade 80 reinforcement bar

* Test conducted on Epoxy coated reinforcement bar

TABLE 1: ZAP SCREWLOK® FX TENSILE TEST RESULTS

BAR SIZE	BAR GR.	TEST LAB ID # & REF #		PEAK STRENGTH		
				MAX STRESS (psi)	% GR. 80 SPEC. YIELD	% GR. 100 SPEC. YIELD
No. 14	80*	14T1223	14A	110,272	138%	-
			14B	111,792	140%	-
	75	14T1299*	14B	106,876	134%	-
	100	14T1360	14A	165,231	207%	165%
			14B	171,761	215%	172%
	100	14T1499	14A	168,624	211%	169%
			14B	163,849	205%	164%
	100	14T1516	14A	153,006	191%	153%
			14B	154,136	193%	154%
	100	14T1578	14A	160,588	201%	161%
			14B	147,224	184%	147%

BAR SIZE	BAR GR.	TEST LAB ID # & REF #		PEAK STRENGTH		
				MAX STRESS (psi)	% GR. 80 SPEC. YIELD	% GR. 100 SPEC. YIELD
No. 18	80*	18T790	18A	109,443	137%	-
			18B	107,369	134%	-
	100	18T854	18A	147,441	184%	147%
	100	18T856	18A	148,961	186%	149%
	100	18T927	18B	149,239	187%	149%
	100	18T944	18A	141,751	177%	142%
	80*	18T994*	18A	100,872	126%	-
	80*	18T1001	18A	112,014	140%	-
	100	18T1036	18A	146,245	183%	146%

* Test conducted on ASTM A706 Grade 80 reinforcement bar

* Test conducted on Epoxy coated reinforcement bar

CHART 1: ZAP SCREWLOK® FX TENSILE TEST RESULTS

