



Zap Screwlok[®]

Type 2 Series

**SHEAR SCREW & WEDGE
MECHANICAL CONNECTIONS
FOR UNCOATED AND
EPOXY COATED
REINFORCING BARS**



PERFORMANCE TEST DATA

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INTRODUCTION

Barsplice Products, Inc. (BPI) have conducted a series of tests on reinforcing bar mechanical splices, sizes No. 3 through No. 18. The tests have been conducted on uncoated and epoxy coated Zap Screwlok® Type 2 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 and Chapter 18 using Grade 60 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 A615, Grade 60 and ASTM A706, Grade 60.

TEST RESULTS

Results of the Zap Screwlok® Type 2 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 Grade 60 rebar or 75,000 psi.

Tension test specimens exceeded the Type 2 strength requirements of ACI 318-19, Chapter 18, namely the specified tensile strength of ASTM A615 and A706 Grade 60 bar, specifically 80,000 psi, which is equivalent to 133% x specified yield.

TABLE 1: ZAP SCREWLOK® TYPE 2 TENSILE TEST RESULTS

BAR SIZE	BAR TYPE	TEST LAB ID # & REF #		PEAK STRENGTH	
				MAX STRESS (psi)	% GR. 60 SPEC. YIELD
No. 3	BLACK	3T112	3A	113,545	189%
			3B	109,545	183%
		3T124	3A	99,364	166%
			3B	100,455	167%
		3T149	3A	101,636	169%
			3B	104,000	173%
	EPOXY	3T80	3A	102,000	170%
			3B	102,182	170%
		3T84	3A	105,273	175%
			3B	100,273	167%
3T89	3A	109,091	182%		
	3B	106,364	177%		
No. 4	BLACK	4T2440	4A	113,550	189%
			4B	112,850	188%
		4T3124	4A	110,400	184%
			4B	110,850	185%
		4T3408	4A	107,450	179%
			4B	106,900	178%
	EPOXY	4T3122 *A706	4A	97,350	162%
			4B	96,700	161%
		4T3376	4A	110,250	184%
			4B	109,300	182%
4T3377	4A	106,650	178%		
	4B	109,600	183%		
No. 5	BLACK	5T4568	5A	109,968	183%
			5B	111,581	186%
		5T7929	5A	106,065	177%
			5B	105,710	176%
		5T8742	5A	101,194	169%
			5B	103,355	172%
	EPOXY	5T7770	5A	103,903	173%
			5B	106,032	177%
		5T7927 *A706	5A	102,613	171%
			5B	102,742	171%
5T8739	5A	102,194	170%		
	5B	105,968	177%		

BAR SIZE	BAR TYPE	TEST LAB ID # & REF #		PEAK STRENGTH	
				MAX STRESS (psi)	% GR. 60 SPEC. YIELD
No. 6	BLACK	6T3578	6A	113,773	190%
			6B	116,795	195%
		6T5452	6A	105,091	175%
			6B	104,455	174%
		6T5555	6A	107,500	179%
			6B	111,341	186%
	EPOXY	6T5451	6A	104,250	174%
			6B	103,341	172%
		6T5754	6A	102,977	172%
			6B	103,841	173%
6T5935	6A	101,023	168%		
	6B	103,614	173%		
No. 7	BLACK	7T2201 *A706	7A	98,283	164%
			7B	97,050	162%
		7T2664	7A	109,452	182%
			7B	109,033	182%
		7T2842	7A	105,591	176%
			7B	108,152	180%
	EPOXY	7T1831	7A	106,583	178%
			7B	107,017	178%
		7T2306	7A	102,168	170%
			7B	103,926	173%
7T2736	7A	99,476	166%		
	7B	102,418	171%		
No. 8	BLACK	8T3613	8A	110,647	184%
			8B	111,197	185%
		8T3709	8A	113,278	189%
			8B	107,064	178%
		8T3719	8A	108,865	181%
			8B	109,992	183%
	EPOXY	8T2651	8A	104,608	174%
			8B	106,684	178%
		8T3500	8A	101,612	169%
			8B	99,760	166%
8T3713	8A	108,506	181%		
	8B	106,453	177%		

TABLE 1: ZAP SCREWLOK® TYPE 2 TENSILE TEST RESULTS

BAR SIZE	BAR TYPE	TEST LAB ID # & REF #		PEAK STRENGTH	
				MAX STRESS (psi)	% GR. 60 SPEC. YIELD
No. 9	BLACK	9T2019 *A706	9A	101,970	170%
			9B	101,320	169%
		9T2363	9A	109,836	183%
			9B	108,621	181%
		9T2394	9A	111,787	186%
			9B	116,548	194%
	EPOXY	9T2169	9A	106,640	178%
			7B	105,420	176%
		9T2289	9A	117,776	196%
			9B	117,063	195%
9T2397	9A	113,341	189%		
	7B	113,105	189%		
No. 10	BLACK	10T1592	10A	110,071	183%
			10B	105,134	175%
		10T1880	10A	107,905	180%
			10B	109,545	183%
		10T2089	10A	106,450	177%
			10B	105,971	177%
	EPOXY	10T2045	10A	105,850	176%
			10B	106,016	177%
		10T2205	10A	104,223	174%
			10B	104,685	174%
10T2209	10A	103,661	173%		
	10B	102,344	171%		
No. 11	BLACK	11T3620 *A706	11A	96,577	161%
			11B	96,673	161%
		11T4022	11A	110,707	185%
			11B	109,935	183%
		11T4207	11A	111,101	185%
			11B	113,273	189%
	EPOXY	11T3894	11A	105,013	175%
			11B	102,128	170%
		11T4211	11A	111,094	185%
			11B	109,604	183%
11T4214	11A	108,383	181%		
	11B	107,584	179%		

BAR SIZE	BAR TYPE	TEST LAB ID # & REF #		PEAK STRENGTH	
				MAX STRESS (psi)	% GR. 60 SPEC. YIELD
No. 14	BLACK	14T1197 *A706	14A	97,356	162%
			14B	100,018	167%
		14T1352	14A	102,087	170%
			14B	101,524	169%
		14T1384	14A	103,751	173%
			14B	101,404	169%
	EPOXY	14T1087	14A	96,763	161%
			14B	98,223	164%
		14T1205	14A	103,006	172%
			14B	104,055	173%
14T1207	14A	102,433	171%		
	14B	101,521	169%		
No. 18	BLACK	18T498	18A	104,378	174%
			18B	101,545	169%
		18T915	18A	103,094	172%
			18B	102,441	171%
		18T917	18A	103,334	172%
			18B	102,575	171%
	EPOXY	18T499	18A	105,695	176%
			18A	98,824	165%
		18T846	18A	95,730	160%
			18B	98,824	165%
18T866	18A	101,405	169%		
	18B	100,952	168%		

* Test conducted on ASTM A706 reinforcement bar

CHART 1: ZAP SCREWLOK® TYPE 2 TENSILE TEST RESULTS

