

Appendix A: Connection Test Data

Appendix A Layout

Appendix A contains all experimental data pertaining to the connection test portion of this study. This Appendix is partitioned as follows:

A1: Data Records

The first portion of this Appendix contains data-recording sheets that list moisture contents, adhesive application pressures and times, raw maximum loads, failure modes, test comments, and construction and testing dates. Each connection specimen is labeled by its shorthand designation as described in Table 3.1. Brief definitions of some of the terms and failure modes included in these sheets are provided in Table A1.1. More detailed explanations of failure modes are given in Chapter 5.

Table A1.1: Description of Terms Used in Data Records

Phrase	Description
6" SPF	6in long Spruce-Pine-Fir main member used
3/8" PLY	Plywood sheathing
7/16" OSB	Oriented Strand Board sheathing
Pmax Cmp	Maximum raw load as recorded by the data acquisition system
Pmax MTS	Maximum raw load as recorded by the MTS testing machine
Bond Failure ()	A complete failure of the adhesive bond - the designation in parentheses indicates which material (Ply, OSB, or 2x4) the tape de-bonded from.
Bond Weakening ()	The bond did not fail, but load capacity was reduced to a predetermined failure level. The designation in parenthesis indicates what material (Ply, OSB, 2x4 or Simult = Simultaneously from both) appeared to provide the weaker bond.
Rolling Tape ()	Adhesive tape de-bonded and rolled up between sheathing and main framing members.
Tape "Stretching"	The tape appeared to elongate and loose strength rather than rolling.
Mode IIIs Nail	Nail yielded at the sheathing interface point.

Note that average loads displayed in these data sheets were computed for general purposes only. These loads are slightly different than the averages listed in Chapter 5 due to the adjustments for slack and pre-loading that were utilized for final comparisons.

A2: Application Pressure Data

This section contains all data pertaining to the investigation of adhesive application pressure on connection performance. Tabulated performance parameters (Tables A2.1-2.8), average load-displacement curves (Figure A2.1), and load-deflection curve comparisons (Figures A2.2-2.8) for each subset are provided. Performance parameter comparison graphs and other summary information can be found in Section 5.3.

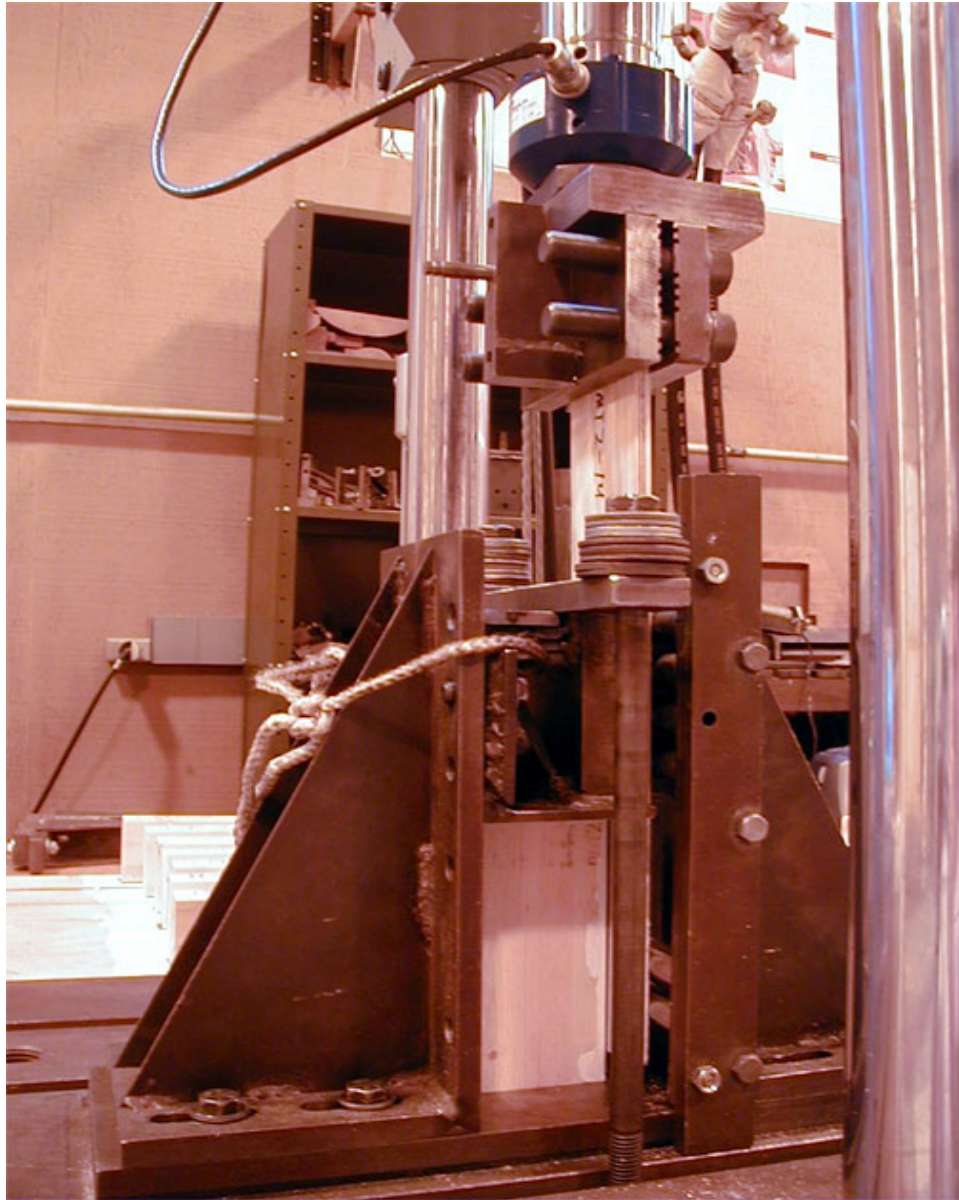
A3: Duration of Application Pressure Data

This section contains all data pertaining to the investigation of duration of application pressure on connection performance. Tabulated performance parameters (Tables A3.1-3.7), average load-displacement curves (Figure A3.1), and load-deflection curve comparisons (Figures A3.2-3.7) for each subset are provided. Performance parameter comparison graphs and other summary information can be found in Section 5.4.

A4: Statistically Significant: Main Connection Study

This section contains all data recorded during the main connection test study. Tabulated performance parameters (Tables A4.1-4.15), average load-displacement curves (Figures A4.1-4.3), and load-deflection curve comparisons (Figures A4.3-3.16) are provided for each subset. Individual load-displacement curves including EEEP parameters are illustrated for each specimen in Figures A4.17-4.188. In each specimen's load-displacement graph, the grey curve represents the raw data while the red curve represents the data calibrated for load offsets and slack. EEEP lines are shown in blue, and 5% offset lines are shown in green. Further discussion and summary information can be found in Sections 5.6-5.10.

Appendix A1: Data Record Sheets



Connection Testing Mechanism

Table A1.2: Data Record Sheet for Comparison Series Connection Specimens (1)

Test Type: Comparison Series		Application Pressure = 15psi Cure Time = 14 days		Load Rate = 0.05 in/min		Machine = 3600			
Date: 3/29/03		5 kip		500 Range		50.00 Range/V			
Load Cell Used:		10 %Scale		10 Volts		55 =1.1% Scl			
Scale Factor (Displacement) =		100 %Scale		10 Volts		0.55 =1.1% Scl			
Scale Factor (Load) =									
Test #	File Name	Main Type	Sheathing	Connect	Special Comments	Pmax MTS (lb)	Pmax Cmp (lb)	M.C.	Comments / Failure Type
1	C-OA-1	6" SPF	7/16" OSB	Adhesive		77.2	77	14	B2 - Bond Failure (OSB)
2	C-OA-2	6" SPF	7/16" OSB	Adhesive		68.34	69	14.2	B1 - Bond Failure (OSB)
3	C-OA-3	6" SPF	7/16" OSB	Adhesive		50.4	51	13.7	B3 - Bond Failure (OSB)
4	C-OA-4	6" SPF	7/16" OSB	Adhesive		49.44	50	12.8	B2 - Bond Failure (OSB)
5	C-OA-5	6" SPF	7/16" OSB	Adhesive	Broken Before Test	10.25	11	13.1	BAD TEST
6	C-OAS-1	6" SPF	7/16" OSB	Adhesive	Sanded	123.42	123	12.1	B2 - Rolling Tape
7	C-OAS-2	6" SPF	7/16" OSB	Adhesive	Sanded	114.27	114	14.5	B1 - Rolling Tape
8	C-OAS-3	6" SPF	7/16" OSB	Adhesive	Sanded	139.17	139	14.1	B3 - Rolling Tape
9	C-OAS-4	6" SPF	7/16" OSB	Adhesive	Sanded	95.74	96	13.3	B2 - Rolling Tape
10	C-OAS-5	6" SPF	7/16" OSB	Adhesive	Sanded	114.85	115	13.4	B3 - Rolling Tape
11	C-OAP-1	6" SPF	7/16" OSB	Adhesive	Sanded	147.52	147	13.4	B2 - Rolling Tape
12	C-OAP-2	6" SPF	7/16" OSB	Adhesive	Sanded	172.5	172	14.4	B3 - Tape "Stretching"
13	C-OAP-3	6" SPF	7/16" OSB	Adhesive	Sanded	137.49	136	15.1	B3 - Rolling Tape
14	C-OAP-4	6" SPF	7/16" OSB	Adhesive	Sanded	123.35	123	12.5	B2 - Rolling Tape
15	C-OAP-5	6" SPF	7/16" OSB	Adhesive	Sanded	96.4	96	14.7	B1 - Tape "Stretching"
Additional Comments on Tests:									
Note: B1, B2, B3 failure types refers to original framing member that specimen was constructed from.									
1 in = 25.4mm 1lb = 4.45N									

Table A1.3: Data Record Sheet for Comparison Series Connection Specimens (2)

Test Type: Comparison Series		Application Pressure = 15psi		Cure Time = 14 days		Load Rate = 0.05 in/min		Machine = 3600	
Date: 3/29/03		5 kip							
Load Cell Used:		10 %Scale		500 Range		10 Volts		50.00 Range/V	
Scale Factor (Displacement) =		100 %Scale		5 Range		10 Volts		0.50 Range/V	
Scale Factor (Load) =								55 =1.1% Scl	
								0.55 =1.1% Scl	
Test #	File Name	Main Type	Sheathing	Connect	Special Comments	Pmax MTS (lb)	Pmax Cmp (lb)	M.C.	Comments / Failure Type
16	C-OAN-1	6" SPF	7/16" OSB	Adh + 8d		414.14	413	14.2	B3 - Adhesive Failure (OSB)
17	C-OAN-2	6" SPF	7/16" OSB	Adh + 8d		290.14	290	13.4	B3 - Adhesive Failure (OSB)
18	C-OAN-3	6" SPF	7/16" OSB	Adh + 8d		263.84	263	13.2	B2 - Adhesive Failure (OSB)
19	C-OAN-4	6" SPF	7/16" OSB	Adh + 8d		359.28	358	14.7	B1 - Partial Adh Failure (OSB)
20	C-OAN-5	6" SPF	7/16" OSB	Adh + 8d		320.82	320	15	B1 - Partial Adh Failure (OSB)
21	C-OAMS-1	M. Stud	7/16" OSB	Adhesive		38.82	39		B1 - Adhesive Failure (OSB)
22	C-OAMS-2	M. Stud	7/16" OSB	Adhesive		33.25	33		B2 - Adhesive Failure (OSB)
23	C-OAMS-3	M. Stud	7/16" OSB	Adhesive		47.25	47		B2 - Adhesive Failure (OSB)
24	C-OAMS-4	M. Stud	7/16" OSB	Adhesive		39.7	40		B3 - Adhesive Failure (OSB)
25	C-OAMS-5	M. Stud	7/16" OSB	Adhesive	Bad Test				Broke in Machine
26	C-PA-1	6" SPF	3/8" Ply	Adhesive		299.14	299	12.9	B2 - Rolling Tape Failure
27	C-PA-2	6" SPF	3/8" Ply	Adhesive		88.85	89	15.6	B1 - Rolling Tape Failure
28	C-PA-3	6" SPF	3/8" Ply	Adhesive		180.26	180	15.2	B3 - Rolling Tape Failure
29	C-PA-4	6" SPF	3/8" Ply	Adhesive		148.99	148	13.5	B2 - Rolling Tape Failure
30	C-PA-5	6" SPF	3/8" Ply	Adhesive		117.12	117	13.2	B1 - Rolling Tape Failure
Additional Comments on Tests:									

Note: B1, B2, B3 failure types refers to original framing member that specimen was constructed from.

Table A1.4: Data Record Sheet for Comparison Series Connection Specimens (3)

Test Type: Comparison Series		Application Pressure = 15psi		Cure Time = 14 days					
Date: 3/29/03		Load Rate = 0.05 in/min		Machine = 3600					
Load Cell Used: 5 kip		10 %Scale		500 Range					
Scale Factor (Displacement) =		100 %Scale		5 Range					
Scale Factor (Load) =		10 Volts		10 Volts					
		50.00 Range/V		55 =1.1% Scl					
		0.50 Range/V		0.55 =1.1% Scl					
Test #	File Name	Main Type	Sheathing	Connect	Special Comments	Pmax MTS (lb)	Pmax Cmp (lb)	M.C.	Comments / Failure Type
31	PAP-1	6" SPF	3/8" Ply	Adhesive	Primed	204.73	204	11.6	B2 - Rolling Adhesive
32	PAP-2	6" SPF	3/8" Ply	Adhesive	Primed	173.75	174	11.1	B2 - Rolling Adhesive
33	PAP-3	6" SPF	3/8" Ply	Adhesive	Primed	265.38	265	13	B3 - Rolling Adhesive
34	PAP-4	6" SPF	3/8" Ply	Adhesive	Primed	208.83	208	13.3	B3 - Rolling Adhesive
35	PAP-5	6" SPF	3/8" Ply	Adhesive	Primed	174.62	174	12.6	B1 - Rolling Adhesive
36	PAN-1	6" SPF	3/8" Ply	Ad + 8d		487.47	487	11	Total Adh. Failure + Nail Bending
37	PAN-2	6" SPF	3/8" Ply	Ad + 8d	went above max	599.987	550	14.7	Total Adh. Failure + Nail Bending
38	PAN-3	6" SPF	3/8" Ply	Ad + 8d		406.24	406	12.8	Total Adh. Failure + Nail Bending
39	PAN-4	6" SPF	3/8" Ply	Ad + 8d		508.93	508	15.1	Total Adh. Failure + Nail Bending
40	PAN-5	6" SPF	3/8" Ply	Ad + 8d		536.68	536	15.2	Total Adh. Failure + Nail Bending
41	PAMS-1	M. Stud	3/8" Ply	Adhesive		216.45	216		B2 - Rolling Adhesive
42	PAMS-2	M. Stud	3/8" Ply	Adhesive		133.02	133		B1 - Rolling Adhesive
43	PAMS-3	M. Stud	3/8" Ply	Adhesive		115.81	115		B1 - Rolling Adhesive
44	PAMS-4	M. Stud	3/8" Ply	Adhesive	broke in MTS				BAD TEST
45	PAMS-5	M. Stud	3/8" Ply	Adhesive		152.94	153		B3 - Rolling Adhesive
Additional Comments on Tests:									

Note: B1, B2, B3 failure types refers to original framing member that specimen was constructed from.

Table A1.5: Data Record Sheet for Comparison Series Connection Specimens (4)

Test Type: Comparison Series		Application Pressure = 15psi		Cure Time = 14 days	
Date: 3/29/03		Load Rate = 0.05 in/min		Machine = 3600	
Load Cell Used: 5 kip					
Scale Factor (Displacement) =	10 %Scale	500 Range	10 Volts	50.00 Range/V	55 =1.1% Scl
Scale Factor (Load) =	100 %Scale	5 Range	10 Volts	0.50 Range/V	0.55 =1.1% Scl

Test #	File Name	Main Type	Sheathing	Connect	Special Comments	Pmax MTS (lb)	Pmax Cmp (lb)	M.C.	Comments / Failure Type
46	OACL-1	6" SPF	7/16" OSB	Adhesive	Clamped for 48 hrs	396.57	396	13.2	Tape "Stretching"
47	OACL-2	6" SPF	7/16" OSB	Adhesive	Clamped for 48 hrs	248.32	247	14.1	Tape "Stretching"
48	PACL-1	6" SPF	3/8" Ply	Adhesive	Clamped for 48 hrs	479.85	479	13.2	Tape "Stretching"
49	PACL-2	6" SPF	3/8" Ply	Adhesive	Clamped for 48 hrs	545.84	545	13.1	Tape "Stretching"

Additional Comments on Tests:									
Note: B1, B2, B3 failure types refers to original framing member that specimen was constructed from.									

Table A1.6: Data Record Sheet for Adhesive Application Pressure Connection Specimens (1)

Test Type Adhesive Application Pressure Variation										
Summary Information										
Date: 5/13/2002		Load Rate: 0.05 in/min		Machine = 3600		Time in Chamber = 5 days				
Load Cell Used:		1 kip								
Scale Factor (Displacement) =		100 % Scale		5 Range		10 Volts		0.5 Range/V		0.55 = 1.1% Scl
Scale Factor (Load) =		100 % Scale		1000 Range		10 Volts		100 Range/V		110 = 1.1% Scl
File #	Main Type	Sheathing	Connection	Pressure (psi)	App. Time	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C.	Comments on Failure / Test
P15-1	6" SPF	3/8" PLY	3M VHB	15	30	quickly peaked out	92	91	15	Bond Failure (Plywood)
P15-2	6" SPF	3/8" PLY	3M VHB	15	30	failed before testing				
P15-3	6" SPF	3/8" PLY	3M VHB	15	30		116	115.1	15.5	Bond Failure (Plywood)
P15-4	6" SPF	3/8" PLY	3M VHB	15	30		119	119	15.5	Rolling Tape Failure
P15-5	6" SPF	3/8" PLY	3M VHB	15	30		94	93	12	Rolling Tape Failure
P30-1	6" SPF	3/8" PLY	3M VHB	30	30		263	263.8	15	Rolling Tape Failure
P30-2	6" SPF	3/8" PLY	3M VHB	30	30		242	242.3	16	Rolling Tape Failure
P30-3	6" SPF	3/8" PLY	3M VHB	30	30		181	180	15	Rolling Tape Failure
P30-4	6" SPF	3/8" PLY	3M VHB	30	30		198	197.8	15	Rolling Tape Failure
P30-5	6" SPF	3/8" PLY	3M VHB	30	30		174	173.9	15	Rolling Tape Failure
P45-1	6" SPF	3/8" PLY	3M VHB	45	30		300	300.3	14	Rolling Tape Failure
P45-2	6" SPF	3/8" PLY	3M VHB	45	30		253	253.4	15	Rolling Tape Failure
P45-3	6" SPF	3/8" PLY	3M VHB	45	30		271	271.7	15	Tape "Stretching"
P45-4	6" SPF	3/8" PLY	3M VHB	45	30		270	270.7	14.5	Tape "Stretching"
P45-5	6" SPF	3/8" PLY	3M VHB	45	30	weak specimen	193	192.3	15	Rolling Tape Failure
Additional Comments on Tests:										
Note: 1in = 25.4mm 1lb = 4.45N										

Table A1.7: Data Record Sheet for Adhesive Application Pressure Connection Specimens (2)

Test Type Adhesive Application Pressure Variation										
Summary Information										
Time in Chamber = 5 days										
Date: 5/13/2002 Load Rate: 0.05 in/min Machine = 3600										
Load Cell Used: 1 kip										
Scale Factor (Displacement) =		100 % Scale		5 Range		10 Volts		0.5 Range/V		0.55 = 1.1% Scl
Scale Factor (Load) =		100 % Scale		1000 Range		10 Volts		100 Range/V		110 = 1.1% Scl
File #	Main Type	Sheathing	Connection	Pressure (psi)	App. Time	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C.	Comments on Failure / Test
P60-1	6" SPF	3/8" PLY	3M VHB	60	30		274	274	15	Bond Failure (Simultaneous)
P60-2	6" SPF	3/8" PLY	3M VHB	60	30		393	393.2	14	Rolling Tape Failure
P60-3	6" SPF	3/8" PLY	3M VHB	60	30		261	260.2	14	Bond Failure (2x4)
P60-4	6" SPF	3/8" PLY	3M VHB	60	30		339	339.3	14	Bond Failure (Simultaneous)
P60-5	6" SPF	3/8" PLY	3M VHB	60	30		334	334.5	14	Bond Failure (2x4)
P80-1	6" SPF	3/8" PLY	3M VHB	80	30		303	303.8	13	Rolling Tape Failure
P80-2	6" SPF	3/8" PLY	3M VHB	80	30		258	258	13	Rolling Tape Failure
P80-3	6" SPF	3/8" PLY	3M VHB	80	30		236	236	11	Rolling Tape Failure
P80-4	6" SPF	3/8" PLY	3M VHB	80	30		345	344.9	12	Rolling Tape Failure
P80-5	6" SPF	3/8" PLY	3M VHB	80	30		155	155	13	Bond Failure (2x4)
P100-1	6" SPF	3/8" PLY	3M VHB	100	30		367	367	15	Bond Failure (2x4)
P100-2	6" SPF	3/8" PLY	3M VHB	100	30		425	425.9	14	Bond Failure (2x4)
P100-3	6" SPF	3/8" PLY	3M VHB	100	30	P100-3 reloaded after 20lb (computer crashed)	353	352.5	14	Rolling Tape Failure
P100-4	6" SPF	3/8" PLY	3M VHB	100	30		355	354.4	13	Rolling Tape Failure
P100-5	6" SPF	3/8" PLY	3M VHB	100	30		345	344.1	14	Rolling Tape Failure
Additional Comments on Tests:										
Note: 1in = 25.4mm 1lb = 4.45N										

Table A1.8: Data Record Sheet for Adhesive Application Pressure Connection Specimens (3)

Test Type Adhesive Application Pressure Variation											
Summary Information											
Date: 5/20/2002		Load Rate: 1 kip		Time in Chamber = 6 days		Machine = 3600					
Load Cell Used:		100 % Scale		5 Range		10 Volts		0.5 Range/V		0.55 = 1.1% Scl	
Scale Factor (Displacement) =		100 % Scale		1000 Range		10 Volts		100 Range/V		110 = 1.1% Scl	
Scale Factor (Load) =											
File #	Main Type	Sheathing	Connection	Pressure (psi)	App. Time	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C.	Comments on Failure / Test	
P120-1	6" SPF	3/8" PLY	3M VHB	120	30		320	320.2	14	Bond Failure (2x4)	
P120-2	6" SPF	3/8" PLY	3M VHB	120	30	odd looking curve	367	369.6	14	Rolling Tape Failure	
P120-3	6" SPF	3/8" PLY	3M VHB	120	30		350	350	14	Rolling Tape Failure	
P120-4	6" SPF	3/8" PLY	3M VHB	120	30		205	205	13	Bond Failure (2x4)	
P120-5	6" SPF	3/8" PLY	3M VHB	120	30		234	235.7	14	Rolling Tape Failure	
Additional Comments on Tests:											Note: 1in = 25.4mm 1lb = 4.45N

Table A1.9: Data Record Sheet for Duration of Pressure Application Connections (1)

Test Type Adhesive Time of Application										
Summary Information										
Time in Chamber = 6 days										
Date: 5/27/2002		Load Rate: 0.05 in/min		Machine = 3600						
Load Cell Used: 1 kip										
Scale Factor (Displacement) =		100 % Scale		5 Range		10 Volts		0.5 Range/V		0.55 = 1.1% Scl
Scale Factor (Load) =		100 % Scale		1000 Range		10 Volts		100 Range/V		110 = 1.1% Scl
File #	Main Type	Sheathing	Connection	Pressure (psi)	App. Time	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C.	Comments on Failure / Test
T15-1	6" SPF	3/8" PLY	3M VHB	60	15	not taped correctly				
T15-2	6" SPF	3/8" PLY	3M VHB	60	15		206	205.4	13	Bond Weakened (2x4)
T15-3	6" SPF	3/8" PLY	3M VHB	60	15		314	314.7	12	Rolling Tape (2x4)
T15-4	6" SPF	3/8" PLY	3M VHB	60	15		202	202.8	13	Rolling Tape (2x4)
T15-5	6" SPF	3/8" PLY	3M VHB	60	15		237	237.2	12	Rolling Tape (2x4)
T30-1	6" SPF	3/8" PLY	3M VHB	60	30		141	140.5	11	Bond Weakened (2x4)
T30-2	6" SPF	3/8" PLY	3M VHB	60	30		188	188	14	Rolling Tape (2x4)
T30-3	6" SPF	3/8" PLY	3M VHB	60	30		304	304.3	11	Rolling Tape (2x4)
T30-4	6" SPF	3/8" PLY	3M VHB	60	30		229	228.8	13	Rolling Tape (2x4)
T30-5	6" SPF	3/8" PLY	3M VHB	60	30		214	213.6	11	Rolling Tape (2x4)
T45-1	6" SPF	3/8" PLY	3M VHB	60	45		208	208	14	Rolling Tape (2x4)
T45-2	6" SPF	3/8" PLY	3M VHB	60	45		325	324.7	13	Rolling Tape (2x4)
T45-3	6" SPF	3/8" PLY	3M VHB	60	45		229	228.7	14	Bond Weakened (2x4)
T45-4	6" SPF	3/8" PLY	3M VHB	60	45		328	327.7	14	Rolling Tape (2x4)
T45-5	6" SPF	3/8" PLY	3M VHB	60	45		277	277.6	13	Rolling Tape (2x4)
Additional Comments on Tests:										
Note: 1in = 25.4mm 1lb = 4.45N										

Table A1.10: Data Record Sheet for Duration of Pressure Application Connections (2)

Test Type		Adhesive Time of Application									
Summary Information		Time in Chamber = 7 days									
Date:	5/28/2002	Load Rt	0.05 in/min	Machine =	3600						
Load Cell Used:		1 kip									
Scale Factor (Displacement) =		100 % Scale		5 Range	10 Volts	0.5 Range/V	0.55 = 1.1% Scl				
Scale Factor (Load) =		100 % Scale		1000 Range	10 Volts	100 Range/V	110 = 1.1% Scl				
File #	Main Type	Sheathing	Connection	Pressure (psi)	App. Time	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C.	Comments on Failure / Test	
T60-1	6" SPF	3/8" PLY	3M VHB	60	60		316	316.9	11	Bond Weakened (2x4)	
T60-2	6" SPF	3/8" PLY	3M VHB	60	60		350	350.4	12	Rolling Tape (2x4)	
T60-3	6" SPF	3/8" PLY	3M VHB	60	60		287	286.5	13	Rolling Tape (2x4)	
T60-4	6" SPF	3/8" PLY	3M VHB	60	60		257	256.5	13	Rolling Tape (2x4)	
T60-5	6" SPF	3/8" PLY	3M VHB	60	60		259	258.9	13	Rolling Tape (2x4)	
T90-1	6" SPF	3/8" PLY	3M VHB	60	90		265	265.5	13	Rolling Tape (2x4)	
T90-2	6" SPF	3/8" PLY	3M VHB	60	90		291	291.4	11	Rolling Tape(2x4)	
T90-3	6" SPF	3/8" PLY	3M VHB	60	90		310	309.1	12	Bond Weakened (Ply)	
T90-4	6" SPF	3/8" PLY	3M VHB	60	90		334	334.7	13	Bond Weakened (2x4)	
T90-5	6" SPF	3/8" PLY	3M VHB	60	90		255	254.9	14	Rolling Tape (Ply)	
T120-1	6" SPF	3/8" PLY	3M VHB	60	120		287	287	13	Rolling Tape (Ply)	
T120-2	6" SPF	3/8" PLY	3M VHB	60	120		278	277.9	14	Rolling Tape (2x4)	
T120-3	6" SPF	3/8" PLY	3M VHB	60	120		208	207.3	14	Rolling Tape (Simult)	
T120-4	6" SPF	3/8" PLY	3M VHB	60	120		318	318	12	Rolling Tape (Simult)	
T120-5	6" SPF	3/8" PLY	3M VHB	60	120		297	297.8	11	Rolling Tape (Simult)	
Additional Comments on Tests:											
Note: 1in = 25.4mm 1lb = 4.45N											

Table A1.11: Data Record Sheet for Statistically Significant Connection Series – S-OA

Test Type Statistically Significant: S-OA (OSB and Adhesive Only)												
Summary Information			Time in Chamber =			Start Date: 5/30/2002			End Date: 6/12/2002			Days: 14
Date:			Load Rate: 0.05 in/min			Machine = 3600			Applied Pressure: = 60psi			
Load Cell Used:			1 kip			5 Range			10 Volts			0.55 = 1.1% Scl
Scale Factor (Displacement) =			100 % Scale			1000 Range			10 Volts			110 = 1.1% Scl
Scale Factor (Load) =			100 % Scale									
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test
S-OA-1	6" SPF	7/16" OSB	3M VHB	617	491.3	61.6	12		278	277.6	12	Bond Weakening (OSB)
S-OA-2	6" SPF	7/16" OSB	3M VHB	618.2	457.3	59.8	12		267	265.9	12	Bond Weakening (OSB)
S-OA-3	6" SPF	7/16" OSB	3M VHB	570	477.9	58.2	9		314	314.4	11	Bond Failure (OSB)
S-OA-4	6" SPF	7/16" OSB	3M VHB	593	482.4	59.7	9		188	187.5	11	Bond Failure (OSB)
S-OA-5	6" SPF	7/16" OSB	3M VHB	614.2	495.8	61.7	8		278	277.6	10	Bond Failure (OSB)
S-OA-6	6" SPF	7/16" OSB	3M VHB	617	503.3	62.2	8		249	248.3	10	Bond Failure (OSB)
S-OA-7	6" SPF	7/16" OSB	3M VHB	622	516	63.2	8		191	191.6	10	Bond Weakening (OSB)
S-OA-8	6" SPF	7/16" OSB	3M VHB	595	500	60.8	13	Test Censored - Accidentally Preloaded	168	166	12	
S-OA-9	6" SPF	7/16" OSB	3M VHB	596	485.5	60.1	11		240	239.4	11.5	Bond Failure (OSB)
S-OA-10	6" SPF	7/16" OSB	3M VHB	604.2	484.3	60.5	10		154	153.8	11	Bond Failure (OSB)
S-OA-11	6" SPF	7/16" OSB	3M VHB	601.8	478.7	60.0	14		203	203.5	12	Bond Weakening (OSB)
S-OA-12	6" SPF	7/16" OSB	3M VHB	617	487	61.3	12		177	176.7	11.5	Bond Failure (OSB)
S-OA-13	6" SPF	7/16" OSB	3M VHB	602	482	60.2	16		316	317.3	12	Bond Weakening (OSB)
S-OA-14	6" SPF	7/16" OSB	3M VHB	617	482	61.1	13		241	240.8	12	Bond Failure (OSB)
S-OA-15	6" SPF	7/16" OSB	3M VHB	602	469	59.5	14		206	205.8	13	Bond Weakening (OSB)
Additional Comments:						Tape Lot Number = 4941-91084-025-7N			Peak Load Total Avg: 231.08			
Note: 1in = 25.4mm 1lb = 4.45N												
Definitions:												
Initial P: = Highest Load Applied to Bond Specimen						Avg Press: = Average Adhesive Application Pressure			M.C. 1: = Moisture Content at Time of Application			
Relaxed P: = Low Limit of Bonding Load (After Relaxation)									M.C. 2: = Moisture Content Immediately after Testing			

Table A1.12: Data Record Sheet for Statistically Significant Connection Series – S-OAS

Test Type Statistically Significant: S-OAS (Sanded OSB and Adhesive Only)												
Summary Information				Time in Chamber =		Start Date: 5/30/2002		End Date: 6/13/2002		Days: 15		
Date:				Load Rate: 0.05 in/min		Machine =		3600		Applied Pressure: = 60psi		
Load Cell Used:				1 kip						Applied Time = 60sec		
Scale Factor (Displacement) =				100 % Scale				5 Range		10 Volts		0.5 Range/V
Scale Factor (Load) =				100 % Scale				1000 Range		10 Volts		100 Range/V
												0.55 = 1.1% Scl
												110 = 1.1% Scl
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test
S-OAS-1	6" SPF	7/16" OSB	3M VHB	590	507.9	61.0	14		442	442.9	13	Bond Weakening (Simult)
S-OAS-2	6" SPF	7/16" OSB	3M VHB	604	514.9	62.2	14		446	446.7	13	Bond Weakening (Simult)
S-OAS-3	6" SPF	7/16" OSB	3M VHB	630	502.6	62.9	10		424	423.4	11	Bond Weakening (Simult)
S-OAS-4	6" SPF	7/16" OSB	3M VHB	574	474.8	58.3	9		310	311.7	11	Bond Weakening (OSB)
S-OAS-5	6" SPF	7/16" OSB	3M VHB	581.5	494	59.8	14		401	400.2	14	Bond Weakening (OSB)
S-OAS-6	6" SPF	7/16" OSB	3M VHB	586.6	474.3	58.9	14	load curve had an unusual step in it	310	310	14	Bond Weakening (OSB)
S-OAS-7	6" SPF	7/16" OSB	3M VHB	581	498.9	60.0	11		333	332.5	12	Bond Weakening (OSB)
S-OAS-8	6" SPF	7/16" OSB	3M VHB	587	503.7	60.6	14		376	376.1	13	Bond Failure (OSB)
S-OAS-9	6" SPF	7/16" OSB	3M VHB	590.3	504	60.8	11		359	357.6	12	Bond Weakening (Simult)
S-OAS-10	6" SPF	7/16" OSB	3M VHB	582	489.4	59.5	13		345	344.4	12	Bond Weakening (OSB)
S-OAS-11	6" SPF	7/16" OSB	3M VHB	586	468.8	58.6	13		365	364.2	12	Bond Failure (OSB)
S-OAS-12	6" SPF	7/16" OSB	3M VHB	592	470	59.0	15		440	440.7	13	Bond Weakening (OSB)
S-OAS-13	6" SPF	7/16" OSB	3M VHB	602	493	60.8	9		438	438.9	10	Bond Weakening (OSB)
S-OAS-14	6" SPF	7/16" OSB	3M VHB	594	480.7	59.7	10		367	366.8	12	Bond Weakening (OSB)
S-OAS-15	6" SPF	7/16" OSB	3M VHB	580	480.5	58.9	14		357	357.3	13	Bond Weakening (Simult)
Additional Comments:						Tape Lot Number = 4941-91084-025-7N			Peak Load Total Avg: 380.9			
Note: 1in = 25.4mm 1lb = 4.45N												
Definitions:												
Initial P: = Highest Load Applied to Bond Specimen				Avg Press: = Average Adhesive Application Pressure				M.C. 1: = Moisture Content at Time of Application				
Relaxed P: = Low Limit of Bonding Load (After Relaxation)								M.C. 2: = Moisture Content Immediately after Testing				

Table A1.13: Data Record Sheet for Statistically Significant Connection Series – S-OAP

Test Type Statistically Significant: S-OAP (Primed OSB and Adhesive Only)													
Summary Information				Time in Chamber =		Start Date: 5/30/2002		End Date: 6/15/2002		Days: 17			
Date:				Load Rate: 0.05 in/min		Machine = 3600		Applied Pressure: = 60psi					
Load Cell Used: 1 kip						5 Range		10 Volts		0.5 Range/V			
Scale Factor (Displacement) =				100 % Scale		1000 Range		10 Volts		110 = 1.1% Scl			
Scale Factor (Load) =				100 % Scale						100 Range/V			
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test	
S-OAP-1	6" SPF	7/16" OSB	3M VHB	596	436.4	57.4	13		504	503.8	13	Bond Weakening (OSB)	
S-OAP-2	6" SPF	7/16" OSB	3M VHB	590	448	57.7	14		459	459.9	13	Bond Weakening (OSB)	
S-OAP-3	6" SPF	7/16" OSB	3M VHB	620	500.9	62.3	15		490	490.2	13	Bond Weakening (OSB)	
S-OAP-4	6" SPF	7/16" OSB	3M VHB	620	463	60.2	16		434	433.6	11	Bond Weakening (OSB)	
S-OAP-5	6" SPF	7/16" OSB	3M VHB	601	499	61.1	11		495	498.3	11	Bond Weakening (OSB)	
S-OAP-6	6" SPF	7/16" OSB	3M VHB	602	487	60.5	10		470	471.6	11	Bond Weakening (OSB)	
S-OAP-7	6" SPF	7/16" OSB	3M VHB	608	506.8	61.9	10		470	470.1	11	Bond Weakening (OSB)	
S-OAP-8	6" SPF	7/16" OSB	3M VHB	604	489	60.7	11		409	409.9	11	Bond Weakening (OSB)	
S-OAP-9	6" SPF	7/16" OSB	3M VHB	607	457.9	59.2	14		454	453.6	12	Bond Weakening (OSB)	
S-OAP-10	6" SPF	7/16" OSB	3M VHB	584	646.9	68.4	18		417	419.3	15	Bond Weakening (OSB)	
S-OAP-11	6" SPF	7/16" OSB	3M VHB	615	475	60.6	13		485	486.1	11	Bond Weakening (OSB)	
S-OAP-12	6" SPF	7/16" OSB	3M VHB	616	507.3	62.4	12		474	472.3	12	Bond Weakening (OSB)	
S-OAP-13	6" SPF	7/16" OSB	3M VHB	605	475.8	60.0	13		496	492.2	12	Bond Weakening (OSB)	
S-OAP-14	6" SPF	7/16" OSB	3M VHB	619	467.2	60.3	17		522	522	14	Bond Weakening (OSB)	
S-OAP-15	6" SPF	7/16" OSB	3M VHB	613	492.1	61.4	11		436	437.3	12	Bond Weakening (OSB)	
Additional Comments:				Tape Lot Number =				Peak Load Total Avg: 468.0					
				4941-91084-025-7N								Note: 1in = 25.4mm 1lb = 4.45N	
Definitions:													
Initial P: = Highest Load Applied to Bond Specimen				Avg Press: = Average Adhesive Application Pressure				M.C. 1: = Moisture Content at Time of Application					
Relaxed P: = Low Limit of Bonding Load (After Relaxation)								M.C. 2: = Moisture Content Immediately after Testing					

Table A1.14: Data Record Sheet for Statistically Significant Connection Series – S-OAN

Test Type Statistically Significant: S-OAN (OSB and Adhesive + 8d Nail)												
Summary Information			Time in Chamber =			Start Date: 5/30/2002		End Date: 6/17/2002		Days: 19		
Date:			Load Rate: 0.05 in/min		Machine = 3600		Applied Pressure: = 60psi					
Load Cell Used: 1 kip							Applied Time = 60sec					
Scale Factor (Displacement) = 100 % Scale			100 % Scale		5 Range		10 Volts		0.5 Range/V		0.55 = 1.1% Scl	
Scale Factor (Load) = 100 % Scale			100 % Scale		1000 Range		10 Volts		100 Range/V		110 = 1.1% Scl	
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test
S-OAN-1	6" SPF	7/16" OSB	VHB+8d Nail	609	451.1	58.9	14		500	500.6	13	Rolling + Mode IIIs Nail
S-OAN-2	6" SPF	7/16" OSB	VHB+8d Nail	611	458.7	59.4	13		483	483.2	11	Rolling + Mode IIIs Nail
S-OAN-3	6" SPF	7/16" OSB	VHB+8d Nail	621.6	457.4	59.9	15		459.6	459.6	12	Rolling + Mode IIIs Nail
S-OAN-4	6" SPF	7/16" OSB	VHB+8d Nail	562	468.9	57.3	10		454	454.7	12	Rolling + Mode IIIs Nail
S-OAN-5	6" SPF	7/16" OSB	VHB+8d Nail	603	477	60.0	13		423	422.8	12	Rolling + Mode IIIs Nail
S-OAN-6	6" SPF	7/16" OSB	VHB+8d Nail	599	477	59.8	14		448	448.7	13	Rolling + Mode IIIs Nail
S-OAN-7	6" SPF	7/16" OSB	VHB+8d Nail	560	479.5	57.8	9		557	557.6	11	Rolling + Mode IIIs Nail
S-OAN-8	6" SPF	7/16" OSB	VHB+8d Nail	597	468	59.2	15		466	466	13	Rolling + Mode IIIs Nail
S-OAN-9	6" SPF	7/16" OSB	VHB+8d Nail	633	513	63.7	10	data recorded incorrectly - restarted	583	583.1	10	Rolling + Mode IIIs Nail
S-OAN-10	6" SPF	7/16" OSB	VHB+8d Nail	591	478.3	59.4	10		216	606.4	11	Rolling + Mode IIIs Nail
S-OAN-11	6" SPF	7/16" OSB	VHB+8d Nail	604.3	505.8	61.7	10		574	574.9	12	Rolling + Mode IIIs Nail
S-OAN-12	6" SPF	7/16" OSB	VHB+8d Nail	587	500.7	60.4	9		536	535.9	10	Rolling + Mode IIIs Nail
S-OAN-13	6" SPF	7/16" OSB	VHB+8d Nail	606	489.9	60.9	10		443	444.2	11	Rolling + Mode IIIs Nail
S-OAN-14	6" SPF	7/16" OSB	VHB+8d Nail	591	482	59.6	10		495	494.1	11	Rolling + Mode IIIs Nail
S-OAN-15	6" SPF	7/16" OSB	VHB+8d Nail	630	497.8	62.7	10		492	492.1	10	Rolling + Mode IIIs Nail
Additional Comments:				Tape Lot Number = 4941-91084-025-7N			Peak Load Total Avg: 501.6			Note: 1in = 25.4mm 1lb = 4.45N		
Definitions:												
Initial P: = Highest Load Applied to Bond Specimen												
Avg Press: = Average Adhesive Application Pressure												
M.C. 1: = Moisture Content at Time of Application												
M.C. 2: = Moisture Content Immediately after Testing												

Table A1.15: Data Record Sheet for Statistically Significant Connection Series – S-ON

Test Type Statistically Significant: S-ON (OSB + 8d Nail)												
Summary Information			Time in Chamber =			Start Date: 5/30/2002			End Date: 6/14/2002			Days: 16
Date:			Load Rate: 0.05 in/min			Machine = 3600			Applied Pressure: = N/A			N/A
Load Cell Used:			1 kip						Applied Time =			N/A
Scale Factor (Displacement) =			100 % Scale			5 Range			10 Volts			0.55 = 1.1% Scl
Scale Factor (Load) =			100 % Scale			1000 Range			10 Volts			110 = 1.1% Scl
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test
S-ON-1	6" SPF	7/16" OSB	8d Nail	Not Applicable	Nail Only Set		9		253	252.3	13	Test Did Not Fail
S-ON-2	6" SPF	7/16" OSB	8d Nail				10		240	241.2	13	"
S-ON-3	6" SPF	7/16" OSB	8d Nail				12		240	239.5	12	"
S-ON-4	6" SPF	7/16" OSB	8d Nail				9		319	319.4	12	"
S-ON-5	6" SPF	7/16" OSB	8d Nail				14	39lb pre-load	289	289.8	14	"
S-ON-6	6" SPF	7/16" OSB	8d Nail				15		256	259.7	12	"
S-ON-7	6" SPF	7/16" OSB	8d Nail				15		242	242.2	14	"
S-ON-8	6" SPF	7/16" OSB	8d Nail				11		263	264.1	11	"
S-ON-9	6" SPF	7/16" OSB	8d Nail				11		278	277.9	11	"
S-ON-10	6" SPF	7/16" OSB	8d Nail				11	MTS lined up incorrectly - some eccentricity present on these three connections.	188	189	10	"
S-ON-11	6" SPF	7/16" OSB	8d Nail				10		265	265.3	11	"
S-ON-12	6" SPF	7/16" OSB	8d Nail				9		265	265.7	13	"
S-ON-13	6" SPF	7/16" OSB	8d Nail				9		205	204.7	11	"
S-ON-14	6" SPF	7/16" OSB	8d Nail				10	Accidentally pre-loaded: Test censored				"
S-ON-15	6" SPF	7/16" OSB	8d Nail				9	OSB is warped	201	201.4	12	"
Additional Comments:			Tape Lot Number =			Not Applicable			Peak Load Total Avg: 250.9			
MTS had a load offset of approximately 35 lb for this test test - this was compensated for in the analysis.												
Note: 1in = 25.4mm 1lb = 4.45N												
Definitions:			Initial P: = Highest Load Applied to Bond Specimen			Avg Press: = Average Adhesive Application Pressure			M.C. 1: = Moisture Content at Time of Application			
			Relaxed P: = Low Limit of Bonding Load (After Relaxation)						M.C. 2: = Moisture Content Immediately after Testing			

Table A1.16: Data Record Sheet for Statistically Significant Connection Series – S-PA

Test Type Statistically Significant: S-PA (Plywood and Adhesive Only)													
Summary Information				Time in Chamber =			Start Date: 5/30/2002		End Date: 6/11/2002		Days: 13		
Date:		Load Rate:		0.05 in/min		Machine =		3600		Applied Pressure: = 60psi		Applied Time = 60sec	
Load Cell Used:		1 kip				5 Range		10 Volts		0.5 Range/V		0.55 = 1.1% Scl	
Scale Factor (Displacement) =		100 % Scale				1000 Range		10 Volts		100 Range/V		110 = 1.1% Scl	
Scale Factor (Load) =		100 % Scale											
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test	
S-PA-1	6" SPF	3/8" PLY	3M VHB	592.3	499.5	60.7	12		336	335.9	11	Rolling Tape (Ply)	
S-PA-2	6" SPF	3/8" PLY	3M VHB	580.1	504	60.2	9		201	201.7	10	Rolling Tape (Ply)	
S-PA-3	6" SPF	3/8" PLY	3M VHB	606	516	62.3	11		429	431.5	11	Rolling Tape (Ply)	
S-PA-4	6" SPF	3/8" PLY	3M VHB	607	518.8	62.5	11		415	414.9	11	Rolling Tape (2x4)	
S-PA-5	6" SPF	3/8" PLY	3M VHB	577	456.9	57.4	11		335	334.6	10	Bond Weakening (Ply)	
S-PA-6	6" SPF	3/8" PLY	3M VHB	565.2	472	57.6	12		331	330.8	12	Rolling Tape (Ply)	
S-PA-7	6" SPF	3/8" PLY	3M VHB	640.1	506.1	63.7	9	unusually high load capacity	507	507.2	11	Rolling Tape (2x4)	
S-PA-8	6" SPF	3/8" PLY	3M VHB	580	480	58.9	12		373	372.8	12	Rolling Tape (2x4)	
S-PA-9	6" SPF	3/8" PLY	3M VHB	588.1	487	59.7	11		371	370.8	11	Rolling Tape (Ply)	
S-PA-10	6" SPF	3/8" PLY	3M VHB	603	487.6	60.6	9		272	270.6	10	Rolling Tape (Ply)	
S-PA-11	6" SPF	3/8" PLY	3M VHB	580	492	59.6	15		304	304.1	13	Bond Weakening (Ply)	
S-PA-12	6" SPF	3/8" PLY	3M VHB	607	466.3	59.6	14		293	292.1	11	Bond Weakening (Ply)	
S-PA-13	6" SPF	3/8" PLY	3M VHB	588.3	522.6	61.7	10		289	390.1	12	Rolling Tape (Simult)	
S-PA-14	6" SPF	3/8" PLY	3M VHB	592	468	58.9	10	weak bond - low load	216	216.2	11	Bond Weakening (Ply)	
S-PA-15	6" SPF	3/8" PLY	3M VHB	593	494.3	60.4	11		472	472.5	11	Bond Weakening (2x4)	
Additional Comments:				Tape Lot Number =			4941-91084-025-7N			Peak Load Total Avg: 349.72			
Note: 1in = 25.4mm 1lb = 4.45N													
Definitions:													
Initial P: = Highest Load Applied to Bond Specimen				Avg Press: = Average Adhesive Application Pressure				M.C. 1: = Moisture Content at Time of Application					
Relaxed P: = Low Limit of Bonding Load (After Relaxation)								M.C. 2: = Moisture Content Immediately after Testing					

Table A1.17: Data Record Sheet for Statistically Significant Connection Series – S-PAN

Test Type Statistically Significant: S-PAN (Plywood and Adhesive + 8d Nail)												
Summary Information			Time in Chamber =			Start Date: 5/30/2002		End Date: 6/17/2002		Days: 19		
Date:			Load Rate: 0.05 in/min			Machine = 3600		Applied Pressure: = 60psi				
Load Cell Used:			1 kip					Applied Time = 60sec				
Scale Factor (Displacement) =			100 % Scale			5 Range		10 Volts		0.5 Range/V		0.55 = 1.1% Scl
Scale Factor (Load) =			100 % Scale			1000 Range		10 Volts		100 Range/V		110 = 1.1% Scl
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test
S-PAN-1	6" SPF	3/8" PLY	VHB+8d Nail	587	501.8	60.5	11	unusually high capacity	700	699.7	11	Rolling + Mode IIIs Nail
S-PAN-2	6" SPF	3/8" PLY	VHB+8d Nail	570.5	485.4	58.7	12		593	592.6	11	Rolling + Mode IIIs Nail
S-PAN-3	6" SPF	3/8" PLY	VHB+8d Nail	596.5	492	60.5	13		610	611	12	Rolling + Mode IIIs Nail
S-PAN-4	6" SPF	3/8" PLY	VHB+8d Nail	592	466	58.8	11		554	555.5	11	Rolling + Mode IIIs Nail
S-PAN-5	6" SPF	3/8" PLY	VHB+8d Nail	590.9	501.7	60.7	13		645	645.8	11	Rolling + Mode IIIs Nail
S-PAN-6	6" SPF	3/8" PLY	VHB+8d Nail	583.4	500	60.2	13		581	581.2	12	Rolling + Mode IIIs Nail
S-PAN-7	6" SPF	3/8" PLY	VHB+8d Nail	607.2	464.6	59.5	8		615	615.3	11	Rolling + Mode IIIs Nail
S-PAN-8	6" SPF	3/8" PLY	VHB+8d Nail	592	497.3	60.5	11		627	628.2	10	Rolling + Mode IIIs Nail
S-PAN-9	6" SPF	3/8" PLY	VHB+8d Nail	591	499.1	60.6	11		682	683.1	11	Rolling + Mode IIIs Nail
S-PAN-10	6" SPF	3/8" PLY	VHB+8d Nail	604.1	500.7	61.4	12		578	579.7	11	Rolling + Mode IIIs Nail
S-PAN-11	6" SPF	3/8" PLY	VHB+8d Nail	582.7	466.2	58.3	9	sudden load applied - premature failure				
S-PAN-12	6" SPF	3/8" PLY	VHB+8d Nail	630	501.5	62.9	8		600	599.8	10	Rolling + Mode IIIs Nail
S-PAN-13	6" SPF	3/8" PLY	VHB+8d Nail	577.3	491.7	59.4	9		617	618.2	11	Rolling + Mode IIIs Nail
S-PAN-14	6" SPF	3/8" PLY	VHB+8d Nail	582	497.7	60.0	9		678	678.6	10	Rolling + Mode IIIs Nail
S-PAN-15	6" SPF	3/8" PLY	VHB+8d Nail	573	500.3	59.6	9		609	613	11	Rolling + Mode IIIs Nail
Additional Comments:							Tape Lot Number = 4941-91084-025-7N			Peak Load Total Avg: 621.55		
Note: 1in = 25.4mm 1lb = 4.45N												
Definitions:												
Initial P: = Highest Load Applied to Bond Specimen												
Avg Press: = Average Adhesive Application Pressure												
M.C. 1: = Moisture Content at Time of Application												
M.C. 2: = Moisture Content Immediately after Testing												

Table A1.18: Data Record Sheet for Statistically Significant Connection Series – S-PN

Test Type Statistically Significant: S-PN (Plywood + 8d Nail)												
Summary Information			Time in Chamber =			Start Date: 5/30/2002			End Date: 6/16/2002			Days: 18
Date:		Load Rate:		0.05 in/min		Machine =		3600		Applied Pressure: =		N/A
Load Cell Used:		1 kip				5 Range		10 Volts		Applied Time =		N/A
Scale Factor (Displacement) =		100 % Scale				1000 Range		10 Volts		0.5 Range/V		0.55 = 1.1% Scl
Scale Factor (Load) =		100 % Scale								100 Range/V		110 = 1.1% Scl
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test
S-PN-1	6" SPF	3/8" PLY	8d Nail	Not Applicable - Nail Only Set			13	20lb initially on specimen	182	182	12	Test Did Not Fail
S-PN-2	6" SPF	3/8" PLY	8d Nail				13		164	163	12	"
S-PN-3	6" SPF	3/8" PLY	8d Nail				13		188	186.5	11	"
S-PN-4	6" SPF	3/8" PLY	8d Nail				12		188	187	11	"
S-PN-5	6" SPF	3/8" PLY	8d Nail				10		202	201.6	11	"
S-PN-6	6" SPF	3/8" PLY	8d Nail				13		217	217.5	12	"
S-PN-7	6" SPF	3/8" PLY	8d Nail				13		168	169.2	12	"
S-PN-8	6" SPF	3/8" PLY	8d Nail				13		202	201.6	12	"
S-PN-9	6" SPF	3/8" PLY	8d Nail				12		186	186.3	11	"
S-PN-10	6" SPF	3/8" PLY	8d Nail				13		192	192.5	12	"
S-PN-11	6" SPF	3/8" PLY	8d Nail				11		203	202.6	11	"
S-PN-12	6" SPF	3/8" PLY	8d Nail				13		186	185.6	11	"
S-PN-13	6" SPF	3/8" PLY	8d Nail				12		192	191.6	11	"
S-PN-14	6" SPF	3/8" PLY	8d Nail				9		218	218.4	10	"
S-PN-15	6" SPF	3/8" PLY	8d Nail				12	45lb initially on specimen	252	251.7	11	"
Additional Comments:						Tape Lot Number =			Not Applicable			Peak Load Total Avg: 195.81
Note: 1in = 25.4mm 1lb = 4.45N												
Definitions:												
Initial P: = Highest Load Applied to Bond Specimen			Avg Press: = Average Adhesive Application Pressure			M.C. 1: = Moisture Content at Time of Application			M.C. 2: = Moisture Content Immediately after Testing			
Relaxed P: = Low Limit of Bonding Load (After Relaxation)												

Table A1.19: Data Record Sheet for Statistically Significant Connection Series – S-PMT1

Test Type Statistically Significant: S-PMT1 (3M VHB 4941)												
Summary Information			Time in Chamber =			Start Date: 7/15/2002			End Date: 7/29/2002			Days: 14
Date:			Load Rate: 0.05 in/min			Machine = 3600			Applied Pressure: = 60psi			
Load Cell Used:			1 kip			5 Range			Applied Time = 60sec			
Scale Factor (Displacement) =			100 % Scale			1000 Range			0.5 Range/V			0.55 = 1.1% Scl
Scale Factor (Load) =			100 % Scale			1000 Range			10 Volts			110 = 1.1% Scl
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test
S-PMT1-1	6" SPF	3/8" PLY	3M VHB	592.5	444.4	57.6	13	ProBlock Primer Used	360	360.8	12	Rolling Tape
S-PMT1-2	6" SPF	3/8" PLY	3M VHB	610	484	60.8	11	ProBlock Primer Used	273	272	11	Bond Failure (Ply)
S-PMT1-3	6" SPF	3/8" PLY	3M VHB	640	514	64.1	12	ProBlock Primer Used	452	451.7	12	Rolling Tape
S-PMT1-4	6" SPF	3/8" PLY	3M VHB	630	518	63.8	12	ProBlock Primer Used	456	456.9	12	Tape "Stretching"
S-PMT1-5	6" SPF	3/8" PLY	3M VHB	625	473	61.0	14	ProBlock Primer Used	245	244.5	12	Bond Failure (Ply)
S-PMT1-6	6" SPF	3/8" PLY	3M VHB	595	457	58.4	12	ProBlock Primer Used	376	375.2	12	Rolling Tape
S-PMT1-7	6" SPF	3/8" PLY	3M VHB	636	486.8	62.4	11	ProBlock Primer Used	308	307.1	11	Rolling Tape
S-PMT1-8	6" SPF	3/8" PLY	3M VHB	580	473	58.5	13	ProBlock Primer Used	244	243	13	Bond Failure (Simult)
S-PMT1-9	6" SPF	3/8" PLY	3M VHB	592.3	446	57.7	15	ProBlock Primer Used	246	245.7	13	Rolling Tape
S-PMT1-10	6" SPF	3/8" PLY	3M VHB	610.5	446	58.7	15	ProBlock Primer Used	244	243.9	13	Bond Failure (Ply)
S-PMT1-11	6" SPF	3/8" PLY	3M VHB	638	463.1	61.2	15	ProBlock Primer Used	224	223.7	12	Bond Failure (2x4)
S-PMT1-12	6" SPF	3/8" PLY	3M VHB	639	470	61.6	14	ProBlock Primer Used	376	375.9	13	Rolling Tape
S-PMT1-13	6" SPF	3/8" PLY	3M VHB	634	497	62.8	15	ProBlock Primer Used	232	246.8	13	Bond Weakening (2x4)
S-PMT1-14	6" SPF	3/8" PLY	3M VHB	638.5	473	61.8	12	ProBlock Primer Used	187	185.8	12	Bond Failure (Ply)
S-PMT1-15	6" SPF	3/8" PLY	3M VHB	605.1	482	60.4	14	ProBlock Primer Used	344	343.2	13	Rolling Tape
Additional Comments:			Tape Lot Number =			Peak Load Total Avg:			305.08			
						Note: 1in = 25.4mm 1lb = 4.45N						
Definitions:			Avg Press: = Average Adhesive Application Pressure			M.C. 1: = Moisture Content at Time of Application						
Initial P: = Highest Load Applied to Bond Specimen						M.C. 2: = Moisture Content Immediately after Testing						
Relaxed P: = Low Limit of Bonding Load (After Relaxation)												

Table A1.20: Data Record Sheet for Statistically Significant Connection Series – S-PMT2

Test Type Statistically Significant: S-PMT2 (Adco AT-2)												
Summary Information			Time in Chamber =			Start Date: 7/15/2002			End Date: 7/29/2002			Days: 14
Date:			Load Rate: 0.05 in/min			Machine = 3600			Applied Pressure: = 60psi			
Load Cell Used:			1 kip						Applied Time = 60sec			
Scale Factor (Displacement) =			100 % Scale			5 Range			0.5 Range/V			0.55 = 1.1% Scl
Scale Factor (Load) =			100 % Scale			1000 Range			10 Volts			110 = 1.1% Scl
									10 Volts			
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test
S-PMT2-1	6" SPF	3/8" PLY	Adco AT-2	591.7	466	58.8	14	ProBlock Primer Used	231	232.1	13	Bond Weakening (Simult)
S-PMT2-2	6" SPF	3/8" PLY	Adco AT-2	606	476	60.1	15	ProBlock Primer Used	243	242.9	13	Bond Weakening (Simult)
S-PMT2-3	6" SPF	3/8" PLY	Adco AT-2	629.1	505.3	63.0	16	ProBlock Primer Used	261	260	14	Bond Weakening (2x4)
S-PMT2-4	6" SPF	3/8" PLY	Adco AT-2	603	468.6	59.5	13	ProBlock Primer Used	167	165.8	14	Bond Weakening (Simult)
S-PMT2-5	6" SPF	3/8" PLY	Adco AT-2	587.5	543	62.8	15	ProBlock Primer Used	180	179.3	14	Rolling Tape
S-PMT2-6	6" SPF	3/8" PLY	Adco AT-2	633	538.1	65.1	12	ProBlock Primer Used	219	218	14	Bond Weakening (Ply)
S-PMT2-7	6" SPF	3/8" PLY	Adco AT-2	612.8	519.4	62.9	14	ProBlock Primer Used	287	287	14	Bond Weakening (Ply)
S-PMT2-8	6" SPF	3/8" PLY	Adco AT-2	608.3	533.4	63.4	13	ProBlock Primer Used	315	315.1	13	Bond Weakening (Ply)
S-PMT2-9	6" SPF	3/8" PLY	Adco AT-2	613.4	532.5	63.7	15	ProBlock Primer Used	296	295.5	15	Bond Weakening (Ply)
S-PMT2-10	6" SPF	3/8" PLY	Adco AT-2	616	523	63.3	13	ProBlock Primer Used	277	277.3	14	Bond Weakening (Ply)
S-PMT2-11	6" SPF	3/8" PLY	Adco AT-2	590.1	503	60.7	14	ProBlock Primer Used	338	338.1	13	Bond Weakening (Simult)
S-PMT2-12	6" SPF	3/8" PLY	Adco AT-2	593.8	463	58.7	14	ProBlock Primer Used	145	143.6	13	Bond Weakening (2x4)
S-PMT2-13	6" SPF	3/8" PLY	Adco AT-2	592.8	462.3	58.6	14	ProBlock Primer Used	186	185.5	13	Bond Weakening (Simult)
S-PMT2-14	6" SPF	3/8" PLY	Adco AT-2	590.2	501	60.6	13	ProBlock Primer Used	385	383.7	13	Bond Weakening (Simult)
S-PMT2-15	6" SPF	3/8" PLY	Adco AT-2	595.5	520	62.0	13	ProBlock Primer Used	388	387	13	Bond Weakening (Simult)
Additional Comments:			Tape Lot Number =				Not Specified on Adhesive Tape			Peak Load Total Avg: 260.7		
Note: 1in = 25.4mm 1lb = 4.45N												
Definitions:												
Initial P: = Highest Load Applied to Bond Specimen						Avg Press: = Average Adhesive Application Pressure			M.C. 1: = Moisture Content at Time of Application			
Relaxed P: = Low Limit of Bonding Load (After Relaxation)									M.C. 2: = Moisture Content Immediately after Testing			

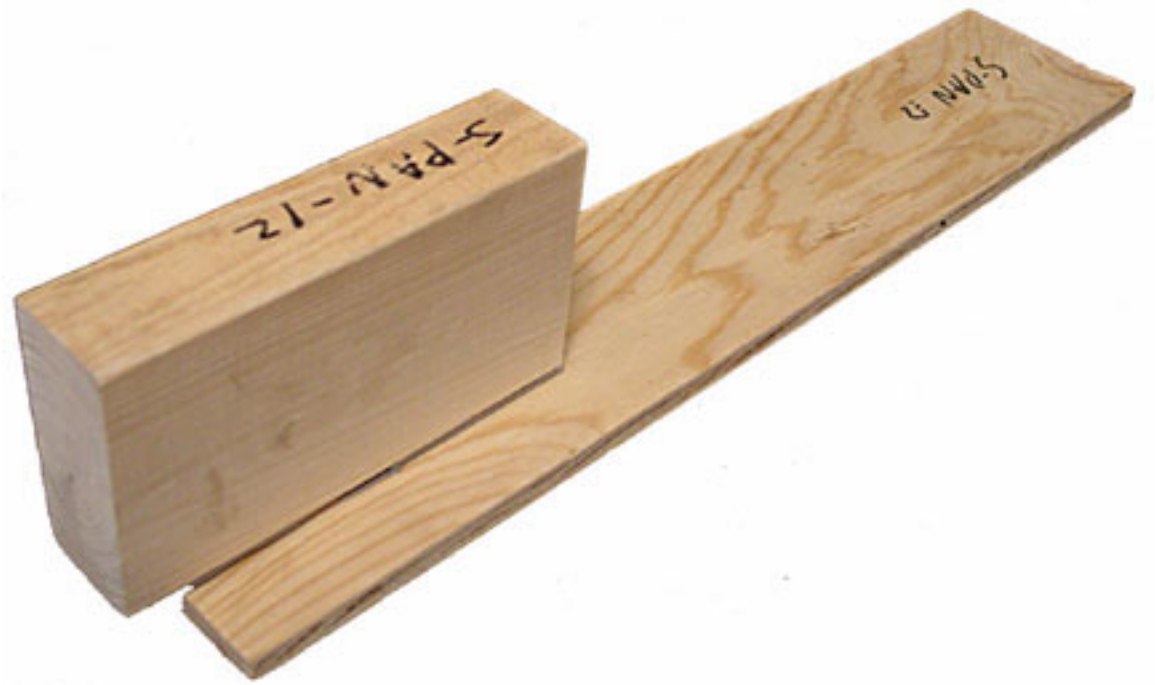
Table A1.21: Data Record Sheet for Statistically Significant Connection Series – S-PMT3

Test Type Statistically Significant: S-PMT3 (Avery 2333)												
Summary Information			Time in Chamber =			Start Date: 7/15/2002			End Date: 7/30/2002			Days: 15
Date:			Load Rate: 0.05 in/min			Machine = 3600			Applied Pressure: = 60psi			Applied Time = 60sec
Load Cell Used: 1 kip												
Scale Factor (Displacement) =			100 % Scale			5 Range			10 Volts			0.5 Range/V
Scale Factor (Load) =			100 % Scale			1000 Range			10 Volts			100 Range/V
												0.55 = 1.1% Scl
												110 = 1.1% Scl
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test
S-PMT3-1	6" SPF	3/8" PLY	Avery 2333	603	498.8	61.2	13	ProBlock Primer Used	214	214.5	13	Bond Failure (Ply)
S-PMT3-2	6" SPF	3/8" PLY	Avery 2333	612.8	521.1	63.0	12	ProBlock Primer Used	299	299.1	12	Bond Failure (Ply)
S-PMT3-3	6" SPF	3/8" PLY	Avery 2333	610.5	570	65.6	12	ProBlock Primer Used	247	245.7	12	Bond Failure (Ply)
S-PMT3-4	6" SPF	3/8" PLY	Avery 2333	585.6	513	61.0	12	ProBlock Primer Used	251	251.1	12	Bond Weakening (Ply)
S-PMT3-5	6" SPF	3/8" PLY	Avery 2333	605.6	521	62.6	12	ProBlock Primer Used	268	267.9	12	Bond Weakening (2x4)
S-PMT3-6	6" SPF	3/8" PLY	Avery 2333	614	530	63.6	12	ProBlock Primer Used	215	214	12	Bond Weakening (Simult)
S-PMT3-7	6" SPF	3/8" PLY	Avery 2333	572.3	512.5	60.3	12	ProBlock Primer Used	241	239.4	12	Bond Failure (Ply)
S-PMT3-8	6" SPF	3/8" PLY	Avery 2333	585	514	61.1	12	ProBlock Primer Used	277	276.1	12	Bond Failure (Ply)
S-PMT3-9	6" SPF	3/8" PLY	Avery 2333	590.9	510.7	61.2	13	ProBlock Primer Used	243	244.9	12	Bond Failure (Ply)
S-PMT3-10	6" SPF	3/8" PLY	Avery 2333	614	535	63.8	12	ProBlock Primer Used	221	221.1	12	Bond Failure (Ply)
S-PMT3-11	6" SPF	3/8" PLY	Avery 2333	586	512	61.0	12	ProBlock Primer Used	247	247.9	12	Bond Failure (Ply)
S-PMT3-12	6" SPF	3/8" PLY	Avery 2333	612	543	64.2	12	ProBlock Primer Used	264	263.3	12	Bond Failure (Ply)
S-PMT3-13	6" SPF	3/8" PLY	Avery 2333	554	485	57.7	11	ProBlock Primer Used	258	257.8	11	Bond Failure (Ply)
S-PMT3-14	6" SPF	3/8" PLY	Avery 2333	590.5	508	61.0	11	ProBlock Primer Used	213	212.7	11	Bond Weakening (Ply)
S-PMT3-15	6" SPF	3/8" PLY	Avery 2333	590	507	60.9	11	ProBlock Primer Used	234	232.8	11	Bond Failure (Ply)
Additional Comments:						Tape Lot Number =			Peak Load Total Avg: 245.9			
						Lot 320665			Note: 1in = 25.4mm 1lb = 4.45N			
						Item: 5628805545						
Roll I.D. # ZF3K1K181703												
Definitions:												
Initial P: = Highest Load Applied to Bond Specimen Relaxed P: = Low Limit of Bonding Load (After Relaxation)						Avg Press: = Average Adhesive Application Pressure			M.C. 1: = Moisture Content at Time of Application M.C. 2: = Moisture Content Immediately after Testing			

Table A1.22: Data Record Sheet for Additional Tests of Interest (Wood Glue & Liquid Nails)

Test Type Additional Tests of Interest: WG (Wood Glue) and LN (Liquid Nails)												
Summary Information			Start Date: N/A			End Date: 6/19/2002			Days: N/A			
Date:			Time in Chamber =			Machine =			Applied Pressure: = N/A			
Load Rate:			0.05 in/min			3600			Applied Time = N/A			
Load Cell Used:			20 kip									
Scale Factor (Displacement) =			100 % Scale			5 Range			0.5 Range/V			
Scale Factor (Load) =			100 % Scale			2000 Range			2000 Range/V			
File #	Main Type	Sheathing	Connection	Initial P (lb)	Relax P (lb)	Avg Press. (psi)	M.C. 1	Special Comments	Pmax Cmp (lb)	Pmax MTS (lb)	M.C. 2	Comments on Failure / Test
WG-O1	6" SPF	7/16" OSB	Wood Glue		Not Applicable		9	50lb pre-load	2250	2250	13	Brittle - Glue Failure
WG-O2	6" SPF	7/16" OSB	Wood Glue				10	70lb pre-load	2127	2136	13	Brittle - Glue Failure
WG-P1	6" SPF	3/8" PLY	Wood Glue				10	70lb pre-load	2501	2470	11	Plywood Failure
WG-P2	6" SPF	3/8" PLY	Wood Glue				10	126lb pre-load	3514	3495	12	Plywood Failure
WG-P3	6" SPF	3/8" PLY	Wood Glue				12	91lb pre-load	3311	3290	10	Plywood Failure
LN-O1	6" SPF	7/16" OSB	Liquid Nails ®				10	44lb pre-load	1544	1521	11	Cohesive Bond Failure
LN-O2	6" SPF	7/16" OSB	Liquid Nails ®				11	32lb pre-load	1618	1594	11	Cohesive Bond Failure
LN-P1	6" SPF	3/8" PLY	Liquid Nails ®				10	62lb pre-load	2149	2121	12	Cohesive Bond Failure
LN-P2	6" SPF	3/8" PLY	Liquid Nails ®				12	97lb pre-load	2376	2353	11	Cohesive Bond Failure
LN-P3	6" SPF	3/8" PLY	Liquid Nails ®				9	48 lb pre-load	1992	1978	11	Cohesive Bond Failure
Additional Comments: Tape Lot Number = N/A												
Pre-loads of up to 100lb were recorded for some of these specimens.												
Wood Glue Peak Load Total Avg: 2740.6 Liquid Nails Peak Load Total Avg: 2033.8												
Definitions: Initial P: = Highest Load Applied to Bond Specimen Relaxed P: = Low Limit of Bonding Load (After Relaxation) Avg Press: = Average Adhesive Application Pressure M.C. 1: = Moisture Content at Time of Application M.C. 2: = Moisture Content Immediately after Testing												

Appendix A2: Application Pressure Data



Connection Test Specimen

Table A2.1a: Pressure Application Performance Parameter Summary (US Customary Units)

OVERALL AVERAGE RESULTS (US Customary Units)							
Data Set	P-15	P-30	P-45	P-60	P-80	P-100	P-120
Max Load (lbs)=	101.7	206.2	252.8	311.8	255.5	361.7	293.6
Displacement (in)=	0.171	0.289	0.323	0.351	0.279	0.350	0.278
Failure Load (lbs)=	81.0	162.4	200.0	246.7	200.9	286.1	230.9
Disp. @ Failure (in)=	0.270	0.378	0.387	0.400	0.347	0.393	0.334
40% Max (lbs)=	39.9	81.21	99.2	124.1	101.2	143.3	115.8
Displacement (in)=	0.021	0.046	0.060	0.076	0.056	0.084	0.057
Yield (lbs)=	91.6	180.0	211.0	260.6	217.1	299.3	250.3
Displacement (in)=	0.047	0.102	0.128	0.160	0.120	0.176	0.124
5% Offset Yield=	76.5	125.1	141.6	172.1	150.1	195.1	176.5
Displacement (in)=	0.067	0.098	0.112	0.132	0.111	0.142	0.115
Elastic Stiffness (lb/in)=	1967.8	1777.3	1684.8	1657.9	1809.8	1722.4	2084.0
Energy (lb*in)=	22.3	59.0	68.8	83.3	63.7	91.0	69.2
Ductility Ratio=	6.06	3.83	3.10	2.59	2.97	2.28	2.90

Data Set KEY
P-15: Tape Applied with 103kPa (15psi) for 30 seconds
P-30: Tape Applied with 207kPa (30psi) for 30 seconds
P-45: Tape Applied with 310kPa (45psi) for 30 seconds
P-60: Tape Applied with 414kPa (60psi) for 30 seconds
P-80: Tape Applied with 552kPa (80psi) for 30 seconds
P-100: Tape Applied with 690kPa (100psi) for 30 seconds
P-120: Tape Applied with 827kPa (120psi) for 30 seconds

Table A2.1b: Pressure Application Performance Parameter Summary (Metric)

OVERALL AVERAGE RESULTS (Metric)							
Data Set	P-15	P-30	P-45	P-60	P-80	P-100	P-120
Max Load (N)=	452.6	917.3	1124.4	1387.2	1136.4	1608.9	1306.1
Displacement (mm)=	4.34	7.34	8.21	8.91	7.09	8.89	7.07
Failure Load (N)=	360.5	722.2	889.8	1097.2	893.7	1272.7	1027.2
Disp. @ Failure (mm)=	6.86	9.61	9.82	10.15	8.82	9.98	8.49
40% Max (N)=	177.3	361.2	441.4	552.0	450.1	637.4	515.0
Displacement (mm)=	0.521	1.172	1.527	1.941	1.422	2.144	1.453
Yield (N)=	407.4	800.8	938.7	1159.0	965.7	1331.3	1113.3
Displacement (mm)=	1.198	2.598	3.240	4.072	3.051	4.479	3.140
5% Offset Yield (N)=	340.1	556.4	630.0	765.4	667.6	867.8	785.0
Displacement (mm)=	1.689	2.483	2.841	3.362	2.818	3.607	2.931
Elastic Stiffness (N/mm)=	344.6	311.3	295.0	290.3	316.9	301.6	365.0
Energy (N*m)=	2.52	6.66	7.77	9.41	7.19	10.28	7.82
Ductility Ratio=	6.06	3.83	3.10	2.59	2.97	2.28	2.90

Data Set KEY
P-15: Tape Applied with 103kPa (15psi) for 30 seconds
P-30: Tape Applied with 207kPa (30psi) for 30 seconds
P-45: Tape Applied with 310kPa (45psi) for 30 seconds
P-60: Tape Applied with 414kPa (60psi) for 30 seconds
P-80: Tape Applied with 552kPa (80psi) for 30 seconds
P-100: Tape Applied with 690kPa (100psi) for 30 seconds
P-120: Tape Applied with 827kPa (120psi) for 30 seconds

Table A2.2a: P-15 Series Performance Parameter Summary (US Customary Units)

P-15								
Sample	Average	StDev	C.O.V.	P-15-1	P-15-2	P-15-3	P-15-4	P-15-5
Max Load (N)=	452.6	66.0	14.6	391.2		510.2	526.4	382.6
Displacement (mm)=	4.343	0.868	20.0	5.712		3.508	4.460	3.691
Failure Load (N)=	360.5	53.6	14.9	310.0		407.1	420.6	304.3
Disp. @ Failure (mm)=	6.864	1.263	18.4	8.390		5.075	7.635	6.358
40% Max (N)=	177.3	25.8	14.6	152.0		198.8	207.1	151.2
Displacement (mm)=	0.521	0.084	16.2	0.378		0.561	0.597	0.549
Yield (N)=	407.4	61.6	15.1	347.1		462.8	474.9	345.0
Displacement (mm)=	1.198	0.197	16.5	0.864		1.307	1.369	1.251
5% Offset Yield (N)=	340.1	63.1	18.6	251.3		423.8	365.6	319.8
Displacement (mm)=	1.689	0.218	12.9	1.328		1.852	1.707	1.869
Elastic Stiffness (N/mm)=	344.62	45.01	13.1	401.67		354.12	347.01	275.67
Energy (N*m)=	2.52	0.54	21.6	2.76		2.05	3.30	1.98
Ductility Ratio=	6.06	2.19	36.2	9.71		3.88	5.58	5.08

Table A2.2b: P-15 Series Performance Parameter Summary (Metric Units)

P-15								
Sample	Average	StDev	C.O.V.	P-15-1	P-15-2	P-15-3	P-15-4	P-15-5
Max Load (N)=	452.6	66.0	14.6	391.2		510.2	526.4	382.6
Displacement (mm)=	4.343	0.868	20.0	5.712		3.508	4.460	3.691
Failure Load (N)=	360.5	53.6	14.9	310.0		407.1	420.6	304.3
Disp. @ Failure (mm)=	6.864	1.263	18.4	8.390		5.075	7.635	6.358
40% Max (N)=	177.3	25.8	14.6	152.0		198.8	207.1	151.2
Displacement (mm)=	0.521	0.084	16.2	0.378		0.561	0.597	0.549
Yield (N)=	407.4	61.6	15.1	347.1		462.8	474.9	345.0
Displacement (mm)=	1.198	0.197	16.5	0.864		1.307	1.369	1.251
5% Offset Yield (N)=	340.1	63.1	18.6	251.3		423.8	365.6	319.8
Displacement (mm)=	1.689	0.197	11.7	0.864		1.307	1.369	1.251
Elastic Stiffness (N/mm)=	344.62	45.01	13.1	401.67		354.12	347.01	275.67
Energy (N*m)=	2.52	0.54	21.6	2.76		2.05	3.30	1.98
Ductility Ratio=	6.06	2.19	36.2	9.71		3.88	5.58	5.08

Table A2.3a: P-30 Series Performance Parameter Summary (US Customary Units)

Data Set: P-30								
Sample	Average	StDev	C.O.V.	P-30-1	P-30-2	P-30-3	P-30-4	P-30-5
Max Load (lbs)=	206.2	34.7	16.8	259.3	233.7	170.7	193.3	174.2
Displacement (in)=	0.289	0.033	11.6	0.337	0.310	0.265	0.293	0.241
Failure Load (lbs)=	162.4	28.2	17.4	206.1	182.6	136.3	154.6	132.2
Disp. @ Failure (in)=	0.378	0.016	4.2	0.399	0.381	0.349	0.382	0.381
40% Max (lbs)=	81.2	13.6	16.8	103.2	90.5	67.7	75.5	69.2
Displacement (in)=	0.046	0.010	21.7	0.064	0.051	0.036	0.042	0.039
Yield (lbs)=	180.0	29.2	16.2	227.7	199.4	149.9	165.1	157.9
Displacement (in)=	0.102	0.022	21.2	0.140	0.111	0.079	0.092	0.089
5% Offset Yield=	125.1	20.0	16.0	159.1	134.4	105.8	106.2	120.0
Displacement (in)=	0.098	0.015	15.6	0.125	0.103	0.082	0.086	0.093
Elastic Stiffness (lb/in)=	1777.29	88.02	5.0	1621.97	1792.94	1895.51	1797.19	1778.85
Energy (lb*in)=	58.95	9.86	16.7	74.76	64.83	46.46	55.52	53.20
Ductility Ratio=	3.83	0.60	15.8	2.84	3.42	4.42	4.16	4.29

Table A2.3b: P-30 Series Performance Parameter Summary (Metric Units)

P-30								
Sample	Average	StDev	C.O.V.	P-30-1	P-30-2	P-30-3	P-30-4	P-30-5
Max Load (N)=	917.3	154.4	16.8	1153.3	1039.4	759.1	859.7	775.0
Displacement (mm)=	7.343	0.851	11.6	8.550	7.871	6.726	7.447	6.121
Failure Load (N)=	722.2	125.4	17.4	916.8	812.4	606.3	687.5	588.1
Disp. @ Failure (mm)=	9.611	0.405	4.2	10.122	9.670	8.875	9.708	9.682
40% Max (N)=	361.2	60.6	16.8	458.9	402.8	301.0	335.8	307.8
Displacement (mm)=	1.172	0.255	21.7	1.615	1.283	0.907	1.067	0.988
Yield (N)=	800.8	130.0	16.2	1013.0	887.1	666.9	734.4	702.6
Displacement (mm)=	2.598	0.552	21.2	3.566	2.825	2.009	2.333	2.255
5% Offset Yield (N)=	556.4	88.9	16.0	707.5	597.9	470.5	472.2	533.8
Displacement (mm)=	2.483	0.387	15.6	3.165	2.626	2.088	2.187	2.350
Elastic Stiffness (N/mm)=	311.25	15.42	5.0	284.05	313.99	331.95	314.74	311.52
Energy (N*m)=	6.66	1.11	16.7	8.45	7.32	5.25	6.27	6.01
Ductility Ratio=	3.83	0.60	15.8	2.84	3.42	4.42	4.16	4.29

Table A2.4a: P-45 Series Performance Parameter Summary (US Customary Units)

Data Set: P-45								
Sample	Average	StDev	C.O.V.	P-45-1	P-45-2	P-45-3	P-45-4	P-45-5
Max Load (lbs)=	252.8	40.0	15.8	299.2	249.5	266.5	269.3	179.4
Displacement (in)=	0.323	0.056	17.2	0.374	0.350	0.337	0.340	0.215
Failure Load (lbs)=	200.0	31.0	15.5	235.3	198.4	210.2	213.6	142.7
Disp. @ Failure (in)=	0.387	0.036	9.4	0.417	0.407	0.400	0.394	0.316
40% Max (lbs)=	99.2	16.4	16.5	118.4	98.8	103.7	106.1	69.1
Displacement (in)=	0.060	0.013	22.3	0.073	0.074	0.058	0.059	0.037
Yield (lbs)=	211.0	26.2	12.4	239.3	208.4	220.7	224.2	162.4
Displacement (in)=	0.128	0.024	18.9	0.147	0.156	0.123	0.124	0.087
5% Offset Yield=	141.6	8.5	6.0	156.6	140.3	142.8	137.6	130.9
Displacement (in)=	0.112	0.013	11.6	0.123	0.131	0.105	0.102	0.097
Elastic Stiffness (lb/in)=	1684.77	192.19	11.4	1624.06	1336.65	1788.75	1801.68	1872.72
Energy (lb*in)=	68.78	12.99	18.9	82.07	68.58	74.69	74.31	44.26
Ductility Ratio=	3.10	0.36	11.5	2.83	2.61	3.24	3.16	3.64

Table A2.4b: P-45 Series Performance Parameter Summary (Metric Units)

P-45								
Sample	Average	StDev	C.O.V.	P-45-1	P-45-2	P-45-3	P-45-4	P-45-5
Max Load (N)=	1124.4	178.1	15.8	1330.8	1109.6	1185.5	1197.9	798.0
Displacement (mm)=	8.210	1.411	17.2	9.502	8.880	8.567	8.633	5.466
Failure Load (N)=	889.8	138.1	15.5	1046.7	882.5	935.0	950.0	634.8
Disp. @ Failure (mm)=	9.823	0.921	9.4	10.592	10.338	10.163	9.997	8.024
40% Max (N)=	441.4	72.9	16.5	526.6	439.4	461.5	472.0	307.4
Displacement (mm)=	1.527	0.340	22.3	1.852	1.877	1.473	1.496	0.937
Yield (N)=	938.7	116.7	12.4	1064.7	927.1	981.8	997.5	722.4
Displacement (mm)=	3.240	0.611	18.9	3.743	3.961	3.134	3.161	2.203
5% Offset Yield (N)=	630.0	37.7	6.0	696.4	623.9	635.4	612.0	582.1
Displacement (mm)=	2.841	0.331	11.6	3.132	3.330	2.677	2.596	2.471
Elastic Stiffness (N/mm)=	295.05	33.66	11.4	284.42	234.08	313.26	315.52	327.96
Energy (N*m)=	7.77	1.47	18.9	9.27	7.75	8.44	8.40	5.00
Ductility Ratio=	3.10	0.36	11.5	2.83	2.61	3.24	3.16	3.64

Table A2.5a: P-60 Series Performance Parameter Summary (US Customary Units)

Data Set: P-60								
Sample	Average	StDev	C.O.V.	P-60-1	P-60-2	P-60-3	P-60-4	P-60-5
Max Load (lbs)=	311.8	47.0	15.1	268.3	381.4	250.9	329.5	329.2
Displacement (in)=	0.351	0.021	5.9	0.329	0.368	0.323	0.361	0.373
Failure Load (lbs)=	246.7	35.9	14.6	212.7	296.2	198.6	263.2	262.6
Disp. @ Failure (in)=	0.400	0.018	4.5	0.377	0.417	0.382	0.403	0.420
40% Max (lbs)=	124.1	18.7	15.1	106.4	151.8	100.1	131.3	130.8
Displacement (in)=	0.076	0.017	21.9	0.063	0.094	0.051	0.081	0.093
Yield (lbs)=	260.6	34.1	13.1	230.1	309.4	214.4	273.7	275.1
Displacement (in)=	0.160	0.033	20.5	0.136	0.191	0.110	0.169	0.196
5% Offset Yield=	172.1	19.2	11.1	160.9	195.0	140.6	182.3	181.6
Displacement (in)=	0.132	0.020	15.3	0.122	0.148	0.098	0.139	0.154
Elastic Stiffness (lb/in)=	1657.89	176.31	10.6	1686.25	1621.44	1955.69	1619.44	1406.62
Energy (lb*in)=	83.31	11.27	13.5	71.05	99.60	70.07	87.10	88.72
Ductility Ratio=	2.59	0.49	19.1	2.76	2.19	3.48	2.38	2.15

Table A2.5b: P-60 Series Performance Parameter Summary (Metric Units)

P-60								
Sample	Average	StDev	C.O.V.	P-60-1	P-60-2	P-60-3	P-60-4	P-60-5
Max Load (N)=	1387.2	209.2	15.1	1193.4	1696.7	1116.1	1465.5	1464.2
Displacement (mm)=	8.910	0.524	5.9	8.357	9.340	8.207	9.169	9.477
Failure Load (N)=	1097.2	159.7	14.6	946.0	1317.7	883.6	1170.8	1168.1
Disp. @ Failure (mm)=	10.154	0.452	4.5	9.576	10.599	9.693	10.229	10.676
40% Max (N)=	552.0	83.2	15.1	473.3	675.1	445.4	584.2	581.9
Displacement (mm)=	1.941	0.426	21.9	1.603	2.377	1.300	2.060	2.362
Yield (N)=	1159.0	151.9	13.1	1023.5	1376.4	953.9	1217.6	1223.7
Displacement (mm)=	4.072	0.834	20.5	3.466	4.847	2.785	4.293	4.968
5% Offset Yield (N)=	765.4	85.2	11.1	715.8	867.2	625.3	810.8	807.9
Displacement (mm)=	3.362	0.514	15.3	3.096	3.764	2.497	3.538	3.917
Elastic Stiffness (N/mm)=	290.34	30.88	10.6	295.31	283.96	342.49	283.61	246.34
Energy (N*m)=	9.41	1.27	13.5	8.03	11.25	7.92	9.84	10.02
Ductility Ratio=	2.59	0.49	19.1	2.76	2.19	3.48	2.38	2.15

Table A2.6a: P-80 Series Performance Parameter Summary (US Customary Units)

Data Set: P-80								
Sample	Average	StDev	C.O.V.	P-80-1	P-80-2	P-80-3	P-80-4	P-80-5
Max Load (lbs)=	255.5	62.1	24.3	300.9	257.2	230.8	334.8	153.8
Displacement (in)=	0.279	0.052	18.5	0.320	0.255	0.286	0.340	0.194
Failure Load (lbs)=	200.9	49.0	24.4	235.1	204.1	180.5	264.0	120.9
Disp. @ Failure (in)=	0.347	0.042	12.1	0.370	0.365	0.342	0.390	0.269
40% Max (lbs)=	101.2	25.0	24.7	120.1	102.5	88.8	133.1	61.4
Displacement (in)=	0.056	0.014	25.7	0.068	0.052	0.048	0.076	0.035
Yield (lbs)=	217.1	48.3	22.3	252.8	225.1	191.2	277.1	139.3
Displacement (in)=	0.120	0.028	23.1	0.142	0.115	0.104	0.159	0.080
5% Offset Yield=	150.1	25.7	17.1	173.2	155.4	123.0	181.0	117.9
Displacement (in)=	0.111	0.015	13.8	0.123	0.108	0.094	0.133	0.097
Elastic Stiffness (lb/in)=	1809.78	81.36	4.5	1776.00	1956.58	1835.67	1747.14	1733.52
Energy (lb*in)=	63.65	18.72	29.4	75.63	69.25	55.39	86.08	31.93
Ductility Ratio=	2.97	0.37	12.4	2.60	3.17	3.28	2.46	3.35

Table A2.6b: P-80 Series Performance Parameter Summary (Metric Units)

P-80								
Sample	Average	StDev	C.O.V.	P-80-1	P-80-2	P-80-3	P-80-4	P-80-5
Max Load (N)=	1136.4	276.4	24.3	1338.3	1144.2	1026.4	1489.2	684.0
Displacement (mm)=	7.088	1.313	18.5	8.138	6.477	7.262	8.641	4.920
Failure Load (N)=	893.7	217.8	24.4	1045.8	907.8	803.1	1174.4	537.6
Disp. @ Failure (mm)=	8.822	1.063	12.1	9.406	9.276	8.682	9.903	6.843
40% Max (N)=	450.1	111.1	24.7	534.0	456.1	395.2	592.2	273.0
Displacement (mm)=	1.422	0.366	25.7	1.717	1.331	1.229	1.935	0.899
Yield (N)=	965.7	214.9	22.3	1124.7	1001.1	850.5	1232.8	619.5
Displacement (mm)=	3.051	0.704	23.1	3.616	2.922	2.646	4.029	2.041
5% Offset Yield (N)=	667.6	114.1	17.1	770.3	691.4	547.0	805.2	524.3
Displacement (mm)=	2.818	0.389	13.8	3.129	2.741	2.375	3.388	2.456
Elastic Stiffness (N/mm)=	316.94	14.25	4.5	311.03	342.65	321.48	305.97	303.59
Energy (N*m)=	7.19	2.12	29.4	8.54	7.82	6.26	9.73	3.61
Ductility Ratio=	2.97	0.37	12.4	2.60	3.17	3.28	2.46	3.35

Table A2.7a: P-100 Series Performance Parameter Summary (US Customary Units)

Data Set: P-100								
Sample	Average	StDev	C.O.V.	P-100-1	P-100-2	P-100-3	P-100-4	P-100-5
Max Load (lbs)=	361.7	27.8	7.7	358.5	415.7	348.4	348.5	337.3
Displacement (in)=	0.350	0.013	3.8	0.356	0.370	0.353	0.340	0.332
Failure Load (lbs)=	286.1	21.9	7.6	281.9	328.7	277.3	276.0	266.7
Disp. @ Failure (in)=	0.393	0.013	3.4	0.394	0.410	0.380	0.376	0.404
40% Max (lbs)=	143.3	11.9	8.3	143.0	166.0	137.1	138.0	132.4
Displacement (in)=	0.084	0.014	16.4	0.089	0.107	0.070	0.086	0.070
Yield (lbs)=	299.3	26.3	8.8	295.9	349.7	287.7	290.3	272.9
Displacement (in)=	0.176	0.030	16.8	0.185	0.226	0.147	0.180	0.144
5% Offset Yield=	195.1	20.9	10.7	198.0	231.6	188.8	190.0	167.1
Displacement (in)=	0.142	0.021	14.9	0.150	0.177	0.124	0.143	0.116
Elastic Stiffness (lb/in)=	1722.40	167.10	9.7	1600.83	1550.30	1957.96	1613.57	1889.36
Energy (lb*in)=	90.99	7.00	7.7	89.11	104.08	88.11	83.15	90.48
Ductility Ratio=	2.28	0.35	15.5	2.13	1.82	2.58	2.09	2.80

Table A2.7b: P-100 Series Performance Parameter Summary (Metric Units)

P-100								
Sample	Average	StDev	C.O.V.	P-100-1	P-100-2	P-100-3	P-100-4	P-100-5
Max Load (N)=	1608.9	123.8	7.7	1594.7	1849.3	1549.7	1550.2	1500.6
Displacement (mm)=	8.889	0.337	3.8	9.042	9.395	8.954	8.633	8.420
Failure Load (N)=	1272.7	97.3	7.6	1254.0	1462.1	1233.3	1227.8	1186.2
Disp. @ Failure (mm)=	9.977	0.335	3.4	9.997	10.424	9.644	9.561	10.257
40% Max (N)=	637.4	52.7	8.3	635.9	738.6	609.7	613.7	589.1
Displacement (mm)=	2.144	0.351	16.4	2.268	2.720	1.778	2.172	1.781
Yield (N)=	1331.3	117.2	8.8	1316.1	1555.7	1279.8	1291.3	1213.7
Displacement (mm)=	4.479	0.753	16.8	4.695	5.730	3.732	4.570	3.668
5% Offset Yield (N)=	867.8	93.1	10.7	880.7	1030.1	840.0	845.3	743.1
Displacement (mm)=	3.607	0.539	14.9	3.797	4.493	3.155	3.637	2.954
Elastic Stiffness (N/mm)=	301.64	29.26	9.7	280.35	271.50	342.89	282.58	330.88
Energy (N*m)=	10.28	0.79	7.7	10.07	11.76	9.95	9.40	10.22
Ductility Ratio=	2.28	0.35	15.5	2.13	1.82	2.58	2.09	2.80

Table A2.8a: P-120 Series Performance Parameter Summary (US Customary Units)

Data Set: P-120								
Sample	Average	StDev	C.O.V.	P-120-1	P-120-2	P-120-3	P-120-4	P-120-5
Max Load (lbs)=	293.6	66.1	22.5	319.2	367.8	349.9	203.0	228.2
Displacement (in)=	0.278	0.052	18.6	0.273	0.330	0.332	0.191	0.266
Failure Load (lbs)=	230.9	51.5	22.3	248.6	289.6	275.6	161.0	179.8
Disp. @ Failure (in)=	0.334	0.044	13.0	0.333	0.380	0.369	0.255	0.335
40% Max (lbs)=	115.8	26.4	22.8	125.7	145.4	138.7	79.6	89.6
Displacement (in)=	0.057	0.017	30.3	0.066	0.072	0.076	0.034	0.039
Yield (lbs)=	250.3	55.9	22.3	286.2	308.7	290.3	171.6	194.5
Displacement (in)=	0.124	0.037	29.9	0.150	0.152	0.159	0.073	0.084
5% Offset Yield=	176.5	32.8	18.6	208.3	204.3	196.5	133.1	140.2
Displacement (in)=	0.115	0.022	19.3	0.137	0.131	0.133	0.083	0.094
Elastic Stiffness (lb/in)=	2084.00	207.87	10.0	1909.66	2033.18	1827.20	2347.13	2302.82
Energy (lb*in)=	69.21	19.98	28.9	73.87	93.79	83.94	37.54	56.94
Ductility Ratio=	2.90	0.70	24.1	2.22	2.50	2.32	3.49	3.97

Table A2.8b: P-120 Series Performance Parameter Summary (Metric Units)

P-120								
Sample	Average	StDev	C.O.V.	P-120-1	P-120-2	P-120-3	P-120-4	P-120-5
Max Load (N)=	1306.1	293.9	22.5	1419.8	1636.1	1556.6	903.1	1014.9
Displacement (mm)=	7.067	1.315	18.6	6.927	8.377	8.433	4.844	6.756
Failure Load (N)=	1027.2	228.9	22.3	1105.7	1288.1	1225.9	716.2	800.0
Disp. @ Failure (mm)=	8.492	1.106	13.0	8.458	9.644	9.362	6.485	8.509
40% Max (N)=	515.0	117.6	22.8	558.9	646.6	616.9	353.9	398.5
Displacement (mm)=	1.453	0.441	30.3	1.671	1.816	1.928	0.861	0.988
Yield (N)=	1113.3	248.5	22.3	1273.3	1373.3	1291.2	763.5	865.1
Displacement (mm)=	3.140	0.938	29.9	3.807	3.857	4.035	1.858	2.145
5% Offset Yield (N)=	785.0	145.9	18.6	926.4	908.8	874.1	592.2	623.6
Displacement (mm)=	2.931	0.567	19.3	3.467	3.317	3.376	2.106	2.390
Elastic Stiffness (N/mm)=	364.96	36.40	10.0	334.43	356.06	319.99	411.04	403.29
Energy (N*m)=	7.82	2.26	28.9	8.35	10.60	9.48	4.24	6.43
Ductility Ratio=	2.90	0.70	24.1	2.22	2.50	2.32	3.49	3.97

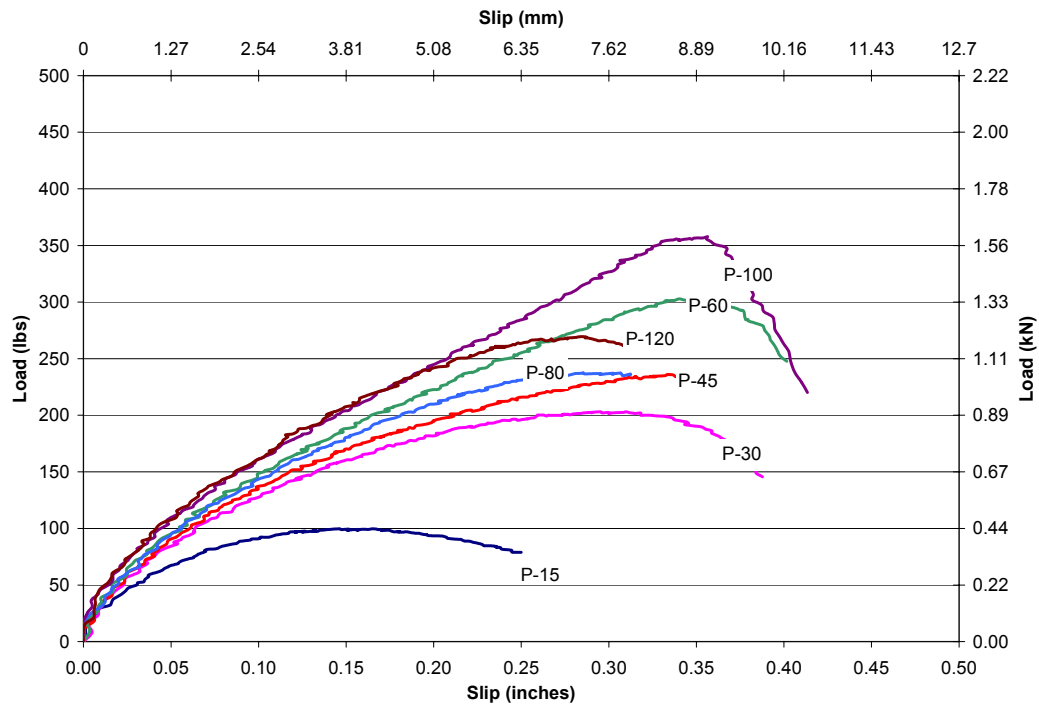


Figure A2.1: Application Pressure Average Load-Displacement Curves

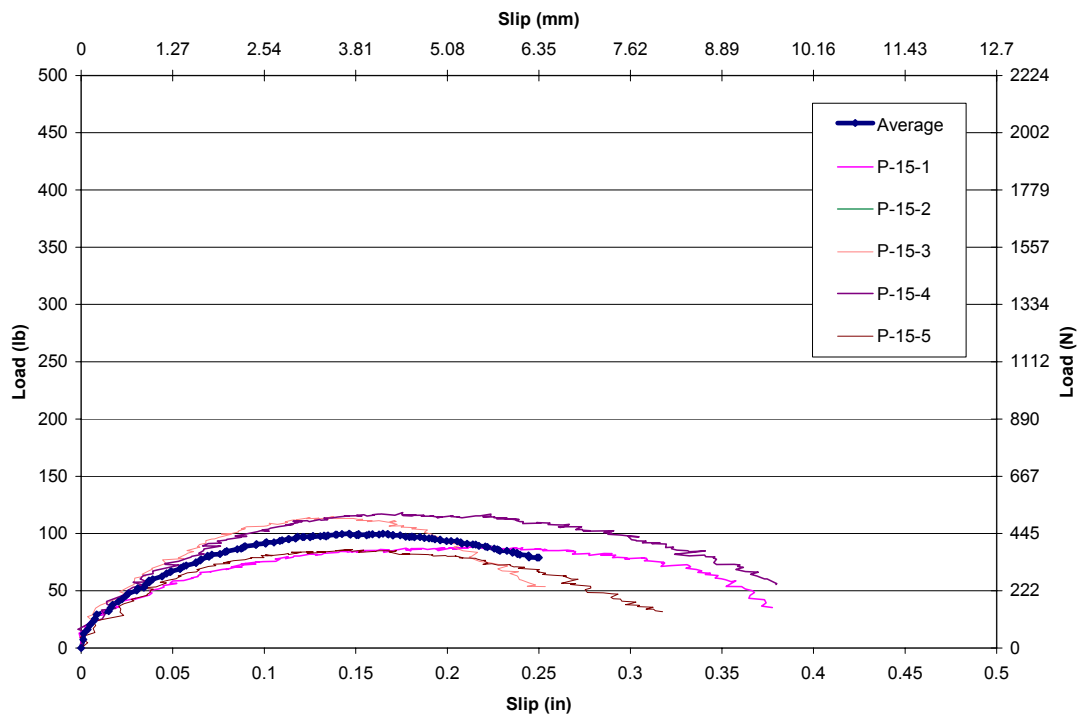


Figure A2.2: Application Pressure Load-Displacement Curves – 103kPa (15psi) for 30 seconds

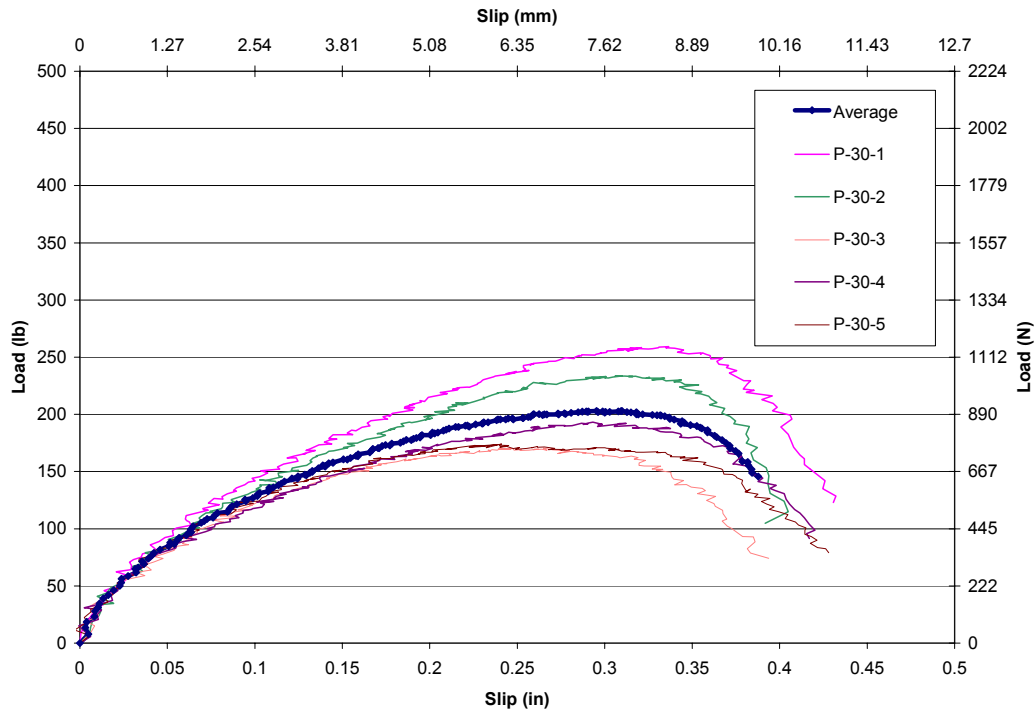


Figure A2.3: Application Pressure Load-Displacement Curves – 207kPa (30psi) for 30 seconds

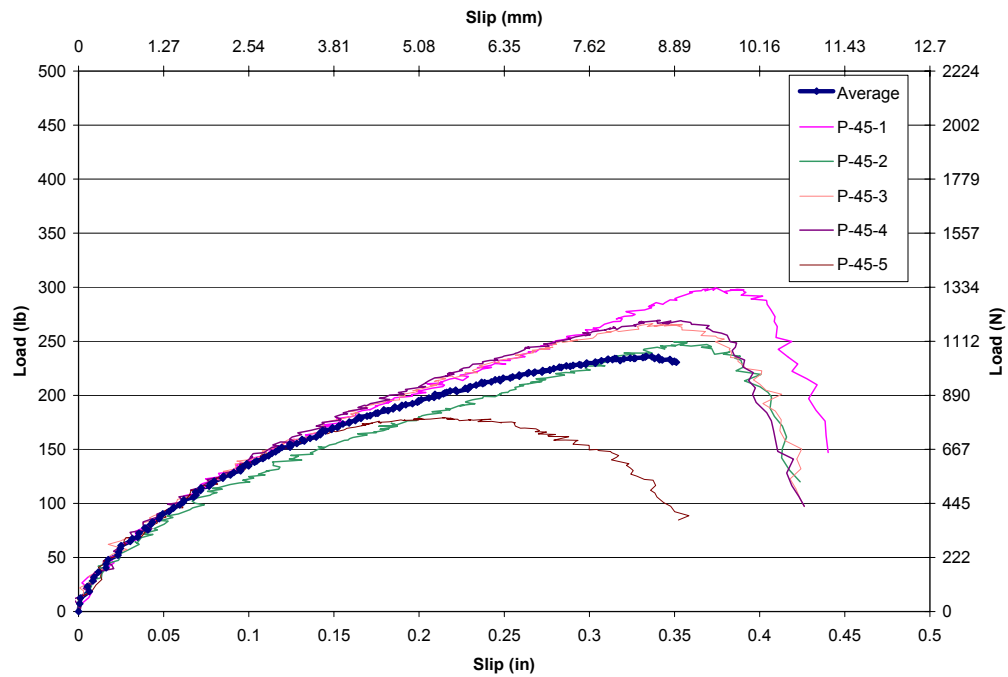


Figure A2.4: Application Pressure Load-Displacement Curves – 310kPa (45psi) for 30 seconds

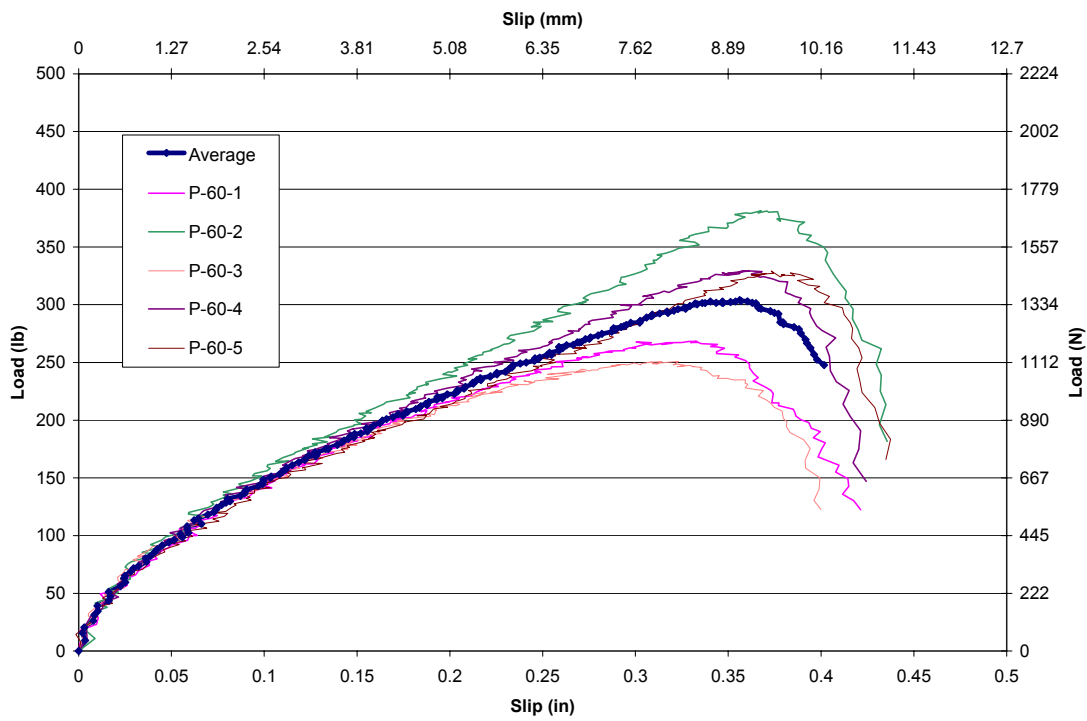


Figure A2.5: Application Pressure Load-Displacement Curves – 414kPa (60psi) for 30 seconds

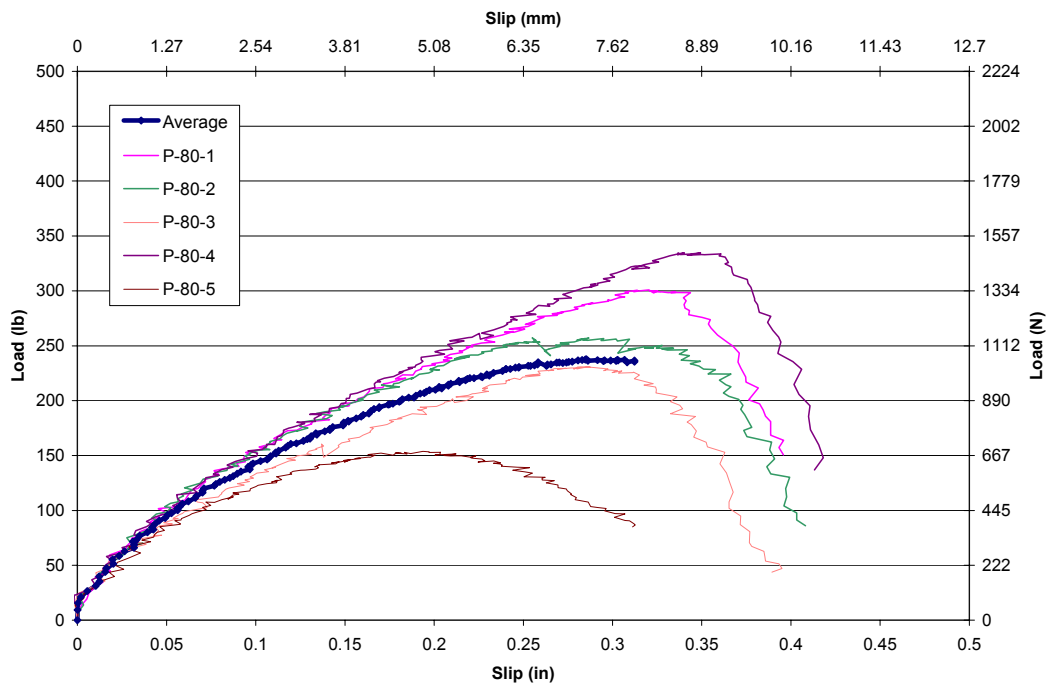


Figure A2.6: Application Pressure Load-Displacement Curves – 552kPa (80psi) for 30 seconds

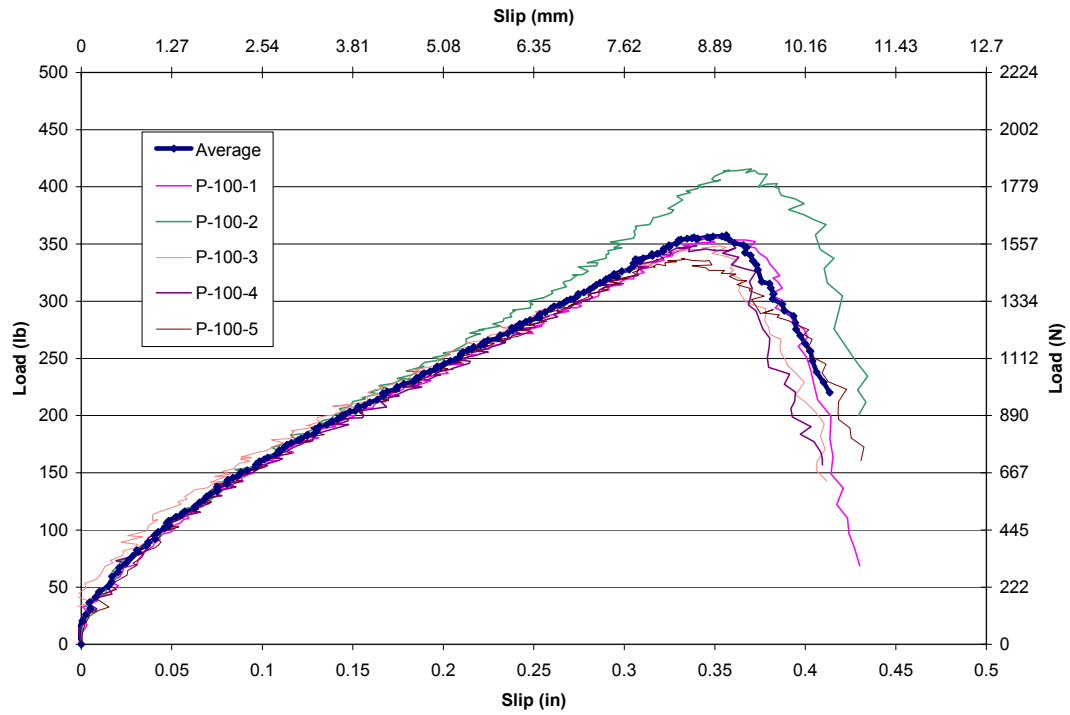


Figure A2.7: Application Pressure Load-Displacement Curves – 690kPa (100psi) for 30 sec.

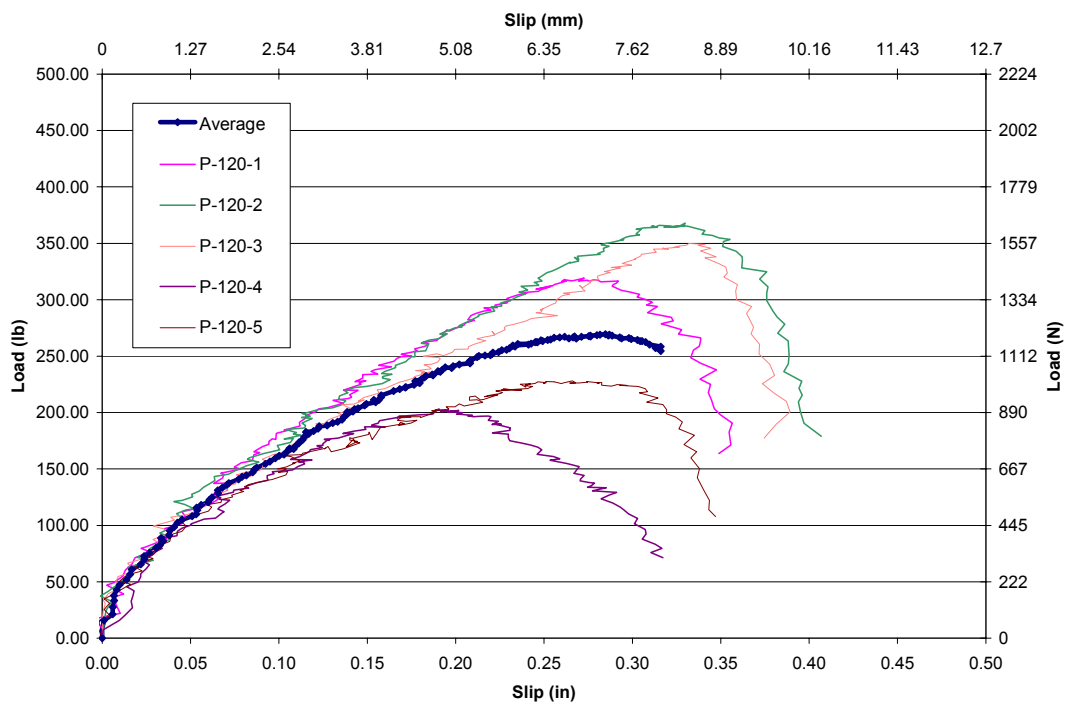


Figure A2.8: Application Pressure Load-Displacement Curves – 827kPa (120psi) for 120 sec.

Appendix A3: Duration of Application Pressure Data



Acrylic Foam Pressure Sensitive Adhesive Tapes

Table A3.1a: Duration of Application Pressure Performance Summary (US Customary Units)

OVERALL AVERAGE RESULTS (US Customary Units)						
Data Set	T-15	T-30	T-45	T-60	T-90	T-120
Max Load (lbs)=	212.8	208.1	265.4	287.2	284.9	270.8
Displacement (in)=	0.324	0.293	0.334	0.321	0.344	0.335
Failure Load (lbs)=	167.7	165.0	210.7	226.1	225.0	214.4
Disp. @ Failure (in)=	0.381	0.352	0.386	0.382	0.386	0.383
40% Max (lbs)=	80.6	81.9	104.9	113.3	112.6	106.6
Displacement (in)=	0.052	0.047	0.057	0.055	0.064	0.070
Yield (lbs)=	178.2	176.7	219.1	238.6	230.7	223.4
Displacement (in)=	0.110	0.101	0.118	0.115	0.131	0.145
5% Offset Yield=	117.9	120.9	141.9	156.3	147.4	149.3
Displacement (in)=	0.099	0.095	0.103	0.102	0.112	0.124
Elastic Stiffness (lb/in)=	2533.2	2002.8	1859.4	2160.2	1805.8	1585.9
Energy (lb*in)=	57.8	54.1	72.0	77.5	74.0	69.3
Ductility Ratio=	6.27	4.14	3.33	3.45	3.05	2.76

Data Set KEY
T-15: Tape Applied with 60psi for 15 seconds
T-30: Tape Applied with 60psi for 30 seconds
T-45: Tape Applied with 60psi for 45seconds
T-60: Tape Applied with 60psi for 60 seconds
T-90: Tape Applied with 60psi for 90 seconds
T-120: Tape Applied with 60psi for 120 seconds

Table A3.1b: Duration of Application Pressure Performance Summary (Metric)

OVERALL AVERAGE RESULTS (Metric)						
Data Set	T-15	T-30	T-45	T-60	T-90	T-120
Max Load (N)=	946.6	925.9	1180.7	1277.6	1267.5	1204.7
Displacement (mm)=	8.23	7.44	8.48	8.16	8.73	8.51
Failure Load (N)=	745.8	734.1	937.1	1005.9	1000.9	953.9
Disp. @ Failure (mm)=	9.68	8.93	9.82	9.70	9.81	9.72
40% Max (N)=	358.7	364.2	466.8	503.8	501.0	474.2
Displacement (mm)=	1.310	1.191	1.438	1.389	1.628	1.765
Yield (N)=	792.8	786.0	974.6	1061.2	1026.4	993.6
Displacement (mm)=	2.790	2.560	3.003	2.926	3.333	3.690
5% Offset Yield (N)=	524.6	537.9	631.3	695.1	655.5	664.2
Displacement (mm)=	2.505	2.417	2.619	2.585	2.837	3.161
Elastic Stiffness (N/mm)=	443.6	350.7	325.6	378.3	316.2	277.7
Energy (N*m)=	6.53	6.11	8.14	8.75	8.36	7.83
Ductility Ratio=	6.27	4.14	3.33	3.45	3.05	2.76

Data Set KEY
T-15: Tape Applied with 414kPa for 15 seconds
T-30: Tape Applied with 414kPa for 30 seconds
T-45: Tape Applied with 414kPa for 45seconds
T-60: Tape Applied with 414kPa for 60 seconds
T-90: Tape Applied with 414kPa for 90 seconds
T-120: Tape Applied with 414kPa for 120 seconds

Table A3.2a: T-15 Series Performance Parameter Summary (US Customary Units)

Data Set: T-15								
Sample	Average	StDev	C.O.V.	T-15-1	T-15-2	T-15-3	T-15-4	T-15-5
Max Load (lbs)=	212.8	50.6	23.8	149.0	199.3	302.0	191.0	222.8
Displacement (in)=	0.324	0.017	5.4	0.312	0.331	0.355	0.308	0.315
Failure Load (lbs)=	167.7	38.5	22.9	119.2	153.7	234.8	152.5	178.2
Disp. @ Failure (in)=	0.381	0.022	5.7	0.356	0.410	0.403	0.359	0.379
40% Max (lbs)=	80.6	25.4	31.5	40.6	79.2	119.8	75.1	88.5
Displacement (in)=	0.052	0.027	52.4	0.006	0.059	0.090	0.055	0.048
Yield (lbs)=	178.2	39.5	22.2	125.8	167.0	244.9	161.4	192.1
Displacement (in)=	0.110	0.053	48.5	0.019	0.125	0.184	0.118	0.103
5% Offset Yield=	117.9	19.0	16.1	91.7	111.4	147.1	109.2	130.2
Displacement (in)=	0.099	0.031	31.9	0.041	0.110	0.137	0.106	0.099
Elastic Stiffness (lb/in)=	2533.16	2129.90	84.1	6774.15	1338.01	1329.33	1364.82	1859.49
Energy (lb*in)=	57.79	11.37	19.7	43.64	58.01	76.04	48.40	62.83
Ductility Ratio=	6.27	6.48	103.3	19.19	3.28	2.19	3.04	3.67

Table A3.2b: T-15 Series Performance Parameter Summary (Metric Units)

T-15								
Sample	Average	StDev	C.O.V.	T-15-1	T-15-2	T-15-3	T-15-4	T-15-5
Max Load (N)=	946.6	225.0	23.8	662.7	886.3	1343.3	849.4	991.3
Displacement (mm)=	8.229	0.441	5.4	7.915	8.410	9.012	7.811	7.996
Failure Load (N)=	745.8	171.1	22.9	530.2	683.5	1044.4	678.4	792.6
Disp. @ Failure (mm)=	9.685	0.555	5.7	9.050	10.406	10.226	9.119	9.622
40% Max (N)=	358.7	113.0	31.5	180.8	352.3	532.8	333.9	393.7
Displacement (mm)=	1.310	0.686	52.4	0.152	1.504	2.289	1.397	1.209
Yield (N)=	792.8	175.7	22.2	559.4	743.0	1089.4	718.0	854.3
Displacement (mm)=	2.790	1.354	48.5	0.472	3.171	4.679	3.004	2.624
5% Offset Yield (N)=	524.6	84.7	16.1	407.7	495.6	654.5	485.7	579.4
Displacement (mm)=	2.505	0.800	31.9	1.052	2.784	3.490	2.697	2.502
Elastic Stiffness (N/mm)=	443.62	373.00	84.1	1186.33	234.32	232.80	239.02	325.65
Energy (N*m)=	6.53	1.28	19.7	4.93	6.55	8.59	5.47	7.10
Ductility Ratio=	6.27	6.48	103.3	19.19	3.28	2.19	3.04	3.67

Table A3.3a: T-30 Series Performance Parameter Summary (US Customary Units)

Data Set: T-30								
Sample	Average	StDev	C.O.V.	T-30-1	T-30-2	T-30-3	T-30-4	T-30-5
Max Load (lbs)=	208.1	53.1	25.5	141.2	170.9	297.7	222.8	208.2
Displacement (in)=	0.293	0.050	17.2	0.216	0.285	0.373	0.306	0.284
Failure Load (lbs)=	165.0	41.3	25.0	112.7	135.8	234.5	175.9	166.3
Disp. @ Failure (in)=	0.352	0.043	12.3	0.285	0.337	0.418	0.372	0.347
40% Max (lbs)=	81.9	21.4	26.1	56.4	66.9	119.0	87.5	79.6
Displacement (in)=	0.047	0.025	53.1	0.029	0.038	0.094	0.050	0.025
Yield (lbs)=	176.7	44.3	25.0	122.1	144.0	251.1	191.2	175.1
Displacement (in)=	0.101	0.052	51.6	0.062	0.081	0.197	0.110	0.054
5% Offset Yield=	120.9	25.1	20.8	96.6	97.6	164.9	128.7	116.8
Displacement (in)=	0.095	0.033	34.4	0.078	0.081	0.156	0.100	0.062
Elastic Stiffness (lb/in)=	2002.76	664.66	33.2	1972.84	1778.72	1272.71	1739.54	3249.97
Energy (lb*in)=	54.08	16.64	30.8	31.06	42.65	80.13	60.54	56.03
Ductility Ratio=	4.14	1.43	34.4	4.61	4.16	2.12	3.38	6.44

Table A3.3b: T-30 Series Performance Parameter Summary (Metric Units)

T-30								
Sample	Average	StDev	C.O.V.	T-30-1	T-30-2	T-30-3	T-30-4	T-30-5
Max Load (N)=	925.9	236.2	25.5	628.2	760.1	1324.0	991.1	925.9
Displacement (mm)=	7.437	1.279	17.2	5.484	7.231	9.479	7.767	7.224
Failure Load (N)=	734.1	183.7	25.0	501.5	604.1	1042.9	782.4	739.9
Disp. @ Failure (mm)=	8.932	1.103	12.3	7.247	8.552	10.612	9.439	8.811
40% Max (N)=	364.2	95.1	26.1	251.0	297.5	529.3	389.2	354.2
Displacement (mm)=	1.191	0.633	53.1	0.726	0.955	2.375	1.278	0.622
Yield (N)=	786.0	196.8	25.0	543.2	640.5	1116.8	850.4	779.0
Displacement (mm)=	2.560	1.320	51.6	1.572	2.056	5.010	2.792	1.369
5% Offset Yield (N)=	537.9	111.6	20.8	429.7	434.2	733.6	572.7	519.4
Displacement (mm)=	2.417	0.831	34.4	1.969	2.050	3.962	2.532	1.572
Elastic Stiffness (N/mm)=	350.74	116.40	33.2	345.50	311.50	222.89	304.64	569.16
Energy (N*m)=	6.11	1.88	30.8	3.51	4.82	9.05	6.84	6.33
Ductility Ratio=	4.14	1.43	34.4	4.61	4.16	2.12	3.38	6.44

Table A3.4a: T-45 Series Performance Parameter Summary (US Customary Units)

Data Set: T-45								
Sample	Average	StDev	C.O.V.	T-45-1	T-45-2	T-45-3	T-45-4	T-45-5
Max Load (lbs)=	265.4	48.0	18.1	200.9	317.4	223.5	319.4	266.0
Displacement (in)=	0.334	0.004	1.2	0.335	0.334	0.327	0.339	0.334
Failure Load (lbs)=	210.7	37.8	18.0	159.9	250.3	177.7	254.5	210.8
Disp. @ Failure (in)=	0.386	0.015	3.9	0.363	0.399	0.374	0.396	0.401
40% Max (lbs)=	104.9	19.5	18.6	79.2	126.2	87.8	127.1	104.3
Displacement (in)=	0.057	0.008	14.6	0.041	0.057	0.058	0.065	0.063
Yield (lbs)=	219.1	40.1	18.3	166.3	263.5	183.3	264.0	218.3
Displacement (in)=	0.118	0.017	14.4	0.086	0.118	0.120	0.134	0.132
5% Offset Yield=	141.9	24.1	17.0	112.1	176.6	118.2	157.8	144.9
Displacement (in)=	0.103	0.010	9.4	0.086	0.107	0.103	0.105	0.115
Elastic Stiffness (lb/in)=	1859.37	246.69	13.3	1922.85	2225.41	1527.36	1970.75	1650.49
Energy (lb*in)=	72.01	14.76	20.5	53.20	89.51	57.49	86.73	73.13
Ductility Ratio=	3.33	0.46	13.7	4.20	3.37	3.11	2.95	3.03

Table A3.4b: T-45 Series Performance Parameter Summary (Metric Units)

T-45								
Sample	Average	StDev	C.O.V.	T-45-1	T-45-2	T-45-3	T-45-4	T-45-5
Max Load (N)=	1180.7	213.5	18.1	893.8	1411.7	994.3	1420.6	1183.3
Displacement (mm)=	8.479	0.098	1.2	8.499	8.484	8.308	8.616	8.486
Failure Load (N)=	937.1	168.3	18.0	711.4	1113.4	790.7	1132.3	937.8
Disp. @ Failure (mm)=	9.816	0.386	3.9	9.225	10.132	9.489	10.046	10.188
40% Max (N)=	466.8	86.7	18.6	352.4	561.3	390.7	565.4	464.0
Displacement (mm)=	1.438	0.211	14.6	1.046	1.440	1.461	1.638	1.605
Yield (N)=	974.6	178.5	18.3	739.7	1172.1	815.6	1174.3	971.1
Displacement (mm)=	3.003	0.433	14.4	2.197	3.008	3.049	3.403	3.360
5% Offset Yield (N)=	631.3	107.3	17.0	498.8	785.4	525.9	701.9	644.7
Displacement (mm)=	2.619	0.246	9.4	2.177	2.710	2.611	2.670	2.929
Elastic Stiffness (N/mm)=	325.63	43.20	13.3	336.74	389.73	267.48	345.13	289.04
Energy (N*m)=	8.14	1.67	20.5	6.01	10.11	6.50	9.80	8.26
Ductility Ratio=	3.33	0.46	13.7	4.20	3.37	3.11	2.95	3.03

Table A3.5a: T-60 Series Performance Parameter Summary (US Customary Units)

Data Set: T-60								
Sample	Average	StDev	C.O.V.	T-60-1	T-60-2	T-60-3	T-60-4	T-60-5
Max Load (lbs)=	287.2	33.9	11.8	310.1	339.9	280.9	251.5	253.7
Displacement (in)=	0.321	0.022	6.8	0.302	0.358	0.308	0.303	0.335
Failure Load (lbs)=	226.1	28.4	12.6	246.9	269.1	221.3	193.9	199.6
Disp. @ Failure (in)=	0.382	0.010	2.5	0.383	0.398	0.373	0.370	0.384
40% Max (lbs)=	113.3	12.8	11.3	121.8	133.1	111.0	99.8	100.6
Displacement (in)=	0.055	0.010	18.9	0.037	0.069	0.053	0.059	0.055
Yield (lbs)=	238.6	26.0	10.9	257.2	278.2	234.1	212.5	210.8
Displacement (in)=	0.115	0.021	18.7	0.079	0.145	0.113	0.125	0.115
5% Offset Yield=	156.3	16.5	10.6	167.8	181.6	151.2	146.0	134.8
Displacement (in)=	0.102	0.015	14.3	0.079	0.121	0.098	0.112	0.099
Elastic Stiffness (lb/in)=	2160.23	566.00	26.2	3265.08	1921.02	2079.47	1699.40	1836.18
Energy (lb*in)=	77.48	10.22	13.2	88.37	90.58	74.22	65.41	68.81
Ductility Ratio=	3.45	0.74	21.5	4.86	2.75	3.32	2.96	3.34

Table A3.5b: T-60 Series Performance Parameter Summary (Metric Units)

T-60								
Sample	Average	StDev	C.O.V.	T-60-1	T-60-2	T-60-3	T-60-4	T-60-5
Max Load (N)=	1277.6	150.7	11.8	1379.6	1511.9	1249.4	1118.6	1128.7
Displacement (mm)=	8.159	0.557	6.8	7.668	9.091	7.831	7.699	8.506
Failure Load (N)=	1005.9	126.4	12.6	1098.2	1196.8	984.3	862.4	888.0
Disp. @ Failure (mm)=	9.695	0.246	2.5	9.728	10.109	9.482	9.408	9.749
40% Max (N)=	503.8	56.8	11.3	541.7	592.2	493.9	443.7	447.6
Displacement (mm)=	1.389	0.262	18.9	0.947	1.760	1.356	1.491	1.392
Yield (N)=	1061.2	115.8	10.9	1144.0	1237.6	1041.5	945.1	937.7
Displacement (mm)=	2.926	0.546	18.7	2.001	3.679	2.860	3.175	2.916
5% Offset Yield (N)=	695.1	73.4	10.6	746.2	807.6	672.4	649.6	599.8
Displacement (mm)=	2.585	0.368	14.3	1.994	3.078	2.497	2.852	2.504
Elastic Stiffness (N/mm)=	378.31	99.12	26.2	571.80	336.42	364.17	297.61	321.56
Energy (N*m)=	8.75	1.15	13.2	9.98	10.23	8.39	7.39	7.77
Ductility Ratio=	3.45	0.74	21.5	4.86	2.75	3.32	2.96	3.34

Table A3.6a: T-90 Series Performance Parameter Summary (US Customary Units)

Data Set: T-90								
Sample	Average	StDev	C.O.V.	T-90-1	T-90-2	T-90-3	T-90-4	T-90-5
Max Load (lbs)=	284.9	27.0	9.5	257.1	284.9	303.2	325.0	254.4
Displacement (in)=	0.344	0.012	3.5	0.326	0.351	0.358	0.349	0.333
Failure Load (lbs)=	225.0	20.8	9.2	201.8	227.3	241.9	252.7	201.3
Disp. @ Failure (in)=	0.386	0.013	3.5	0.371	0.395	0.392	0.403	0.370
40% Max (lbs)=	112.6	10.3	9.1	102.0	113.6	119.4	127.6	100.5
Displacement (in)=	0.064	0.013	19.9	0.055	0.076	0.068	0.078	0.045
Yield (lbs)=	230.7	21.9	9.5	205.8	230.6	243.6	264.6	209.2
Displacement (in)=	0.131	0.026	19.9	0.110	0.153	0.138	0.162	0.093
5% Offset Yield=	147.4	12.0	8.1	130.7	149.6	153.6	164.9	138.0
Displacement (in)=	0.112	0.014	12.7	0.097	0.127	0.112	0.127	0.095
Elastic Stiffness (lb/in)=	1805.77	256.13	14.2	1872.42	1504.98	1765.78	1631.44	2254.21
Energy (lb*in)=	73.97	7.33	9.9	64.95	73.39	78.74	85.12	67.65
Ductility Ratio=	3.05	0.56	18.3	3.37	2.58	2.84	2.48	3.99

Table A3.6b: T-90 Series Performance Parameter Summary (Metric Units)

T-90								
Sample	Average	StDev	C.O.V.	T-90-1	T-90-2	T-90-3	T-90-4	T-90-5
Max Load (N)=	1267.5	120.2	9.5	1143.5	1267.5	1348.9	1445.8	1131.8
Displacement (mm)=	8.728	0.306	3.5	8.278	8.923	9.101	8.872	8.466
Failure Load (N)=	1000.9	92.5	9.2	897.8	1011.3	1076.1	1124.1	895.2
Disp. @ Failure (mm)=	9.806	0.341	3.5	9.413	10.030	9.962	10.231	9.393
40% Max (N)=	501.0	45.7	9.1	453.9	505.4	531.0	567.5	447.2
Displacement (mm)=	1.628	0.324	19.9	1.384	1.918	1.717	1.986	1.133
Yield (N)=	1026.4	97.5	9.5	915.3	1025.7	1083.6	1177.0	930.5
Displacement (mm)=	3.333	0.664	19.9	2.791	3.892	3.504	4.120	2.357
5% Offset Yield (N)=	655.5	53.2	8.1	581.6	665.4	683.4	733.3	613.8
Displacement (mm)=	2.837	0.361	12.7	2.459	3.236	2.852	3.236	2.400
Elastic Stiffness (N/mm)=	316.24	44.85	14.2	327.91	263.56	309.24	285.71	394.77
Energy (N*m)=	8.36	0.83	9.9	7.34	8.29	8.90	9.62	7.64
Ductility Ratio=	3.05	0.56	18.3	3.37	2.58	2.84	2.48	3.99

Table A3.7a: T-120 Series Performance Parameter Summary (US Customary Units)

Data Set: T-120								
Sample	Average	StDev	C.O.V.	T-120-1	T-120-2	T-120-3	T-120-4	T-120-5
Max Load (lbs)=	270.8	36.3	13.4	278.9	266.5	204.7	311.4	292.6
Displacement (in)=	0.335	0.019	5.6	0.335	0.323	0.307	0.358	0.354
Failure Load (lbs)=	214.4	29.0	13.5	220.1	211.3	161.7	247.1	232.0
Disp. @ Failure (in)=	0.383	0.015	3.9	0.378	0.379	0.363	0.410	0.383
40% Max (lbs)=	106.6	15.4	14.5	108.5	106.5	78.3	123.8	116.0
Displacement (in)=	0.070	0.017	23.9	0.058	0.085	0.043	0.077	0.085
Yield (lbs)=	223.4	25.7	11.5	228.0	221.2	176.5	252.1	239.1
Displacement (in)=	0.145	0.031	21.6	0.122	0.177	0.097	0.156	0.175
5% Offset Yield=	149.3	11.8	7.9	153.8	147.4	127.7	162.6	155.0
Displacement (in)=	0.124	0.018	14.6	0.110	0.144	0.097	0.133	0.139
Elastic Stiffness (lb/in)=	1585.94	244.65	15.4	1867.03	1251.10	1828.62	1616.79	1366.18
Energy (lb*in)=	69.26	9.26	13.4	72.28	64.17	55.62	83.61	70.64
Ductility Ratio=	2.76	0.61	22.0	3.10	2.14	3.76	2.63	2.19

Table A3.7b: T-120 Series Performance Parameter Summary (Metric Units)

T-120								
Sample	Average	StDev	C.O.V.	T-120-1	T-120-2	T-120-3	T-120-4	T-120-5
Max Load (N)=	1204.7	161.5	13.4	1240.7	1185.3	910.3	1385.3	1301.8
Displacement (mm)=	8.513	0.480	5.6	8.504	8.212	7.790	9.081	8.979
Failure Load (N)=	953.9	129.0	13.5	979.3	939.8	719.1	1098.9	1032.2
Disp. @ Failure (mm)=	9.716	0.383	3.9	9.604	9.614	9.230	10.404	9.728
40% Max (N)=	474.2	68.7	14.5	482.5	473.6	348.1	550.9	515.9
Displacement (mm)=	1.765	0.421	23.9	1.476	2.162	1.087	1.946	2.156
Yield (N)=	993.6	114.2	11.5	1014.0	983.9	785.1	1121.6	1063.4
Displacement (mm)=	3.690	0.795	21.6	3.101	4.491	2.452	3.961	4.445
5% Offset Yield (N)=	664.2	52.7	7.9	684.3	655.6	568.0	723.3	689.5
Displacement (mm)=	3.161	0.461	14.6	2.789	3.655	2.456	3.366	3.538
Elastic Stiffness (N/mm)=	277.74	42.84	15.4	326.97	219.10	320.24	283.14	239.26
Energy (N*m)=	7.83	1.05	13.4	8.17	7.25	6.28	9.45	7.98
Ductility Ratio=	2.76	0.61	22.0	3.10	2.14	3.76	2.63	2.19

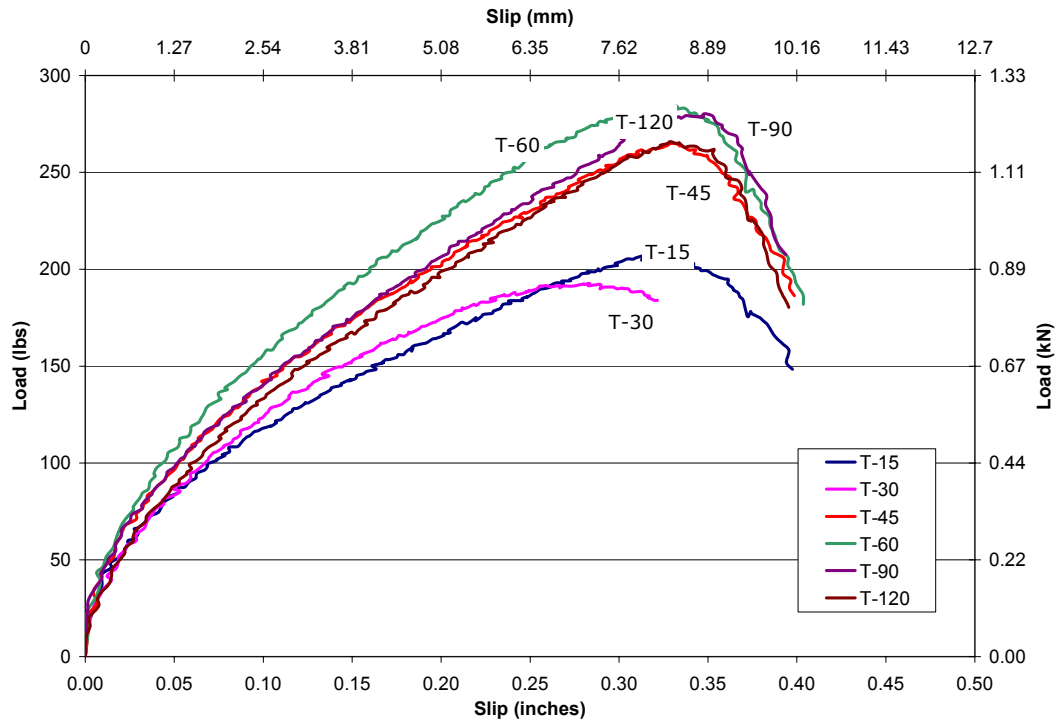


Figure A3.1: Duration of Application Pressure Average Load-Displacement Curves

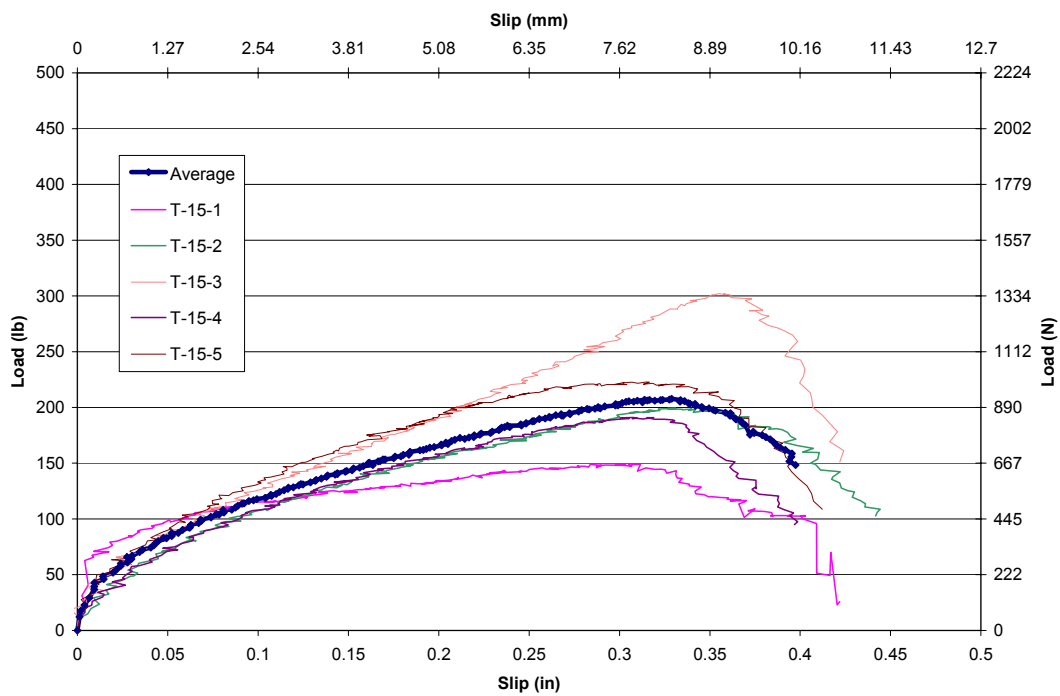


Figure A3.2: Pressure Duration Load-Displacement Curves – 414kPa (60psi) for 15 seconds

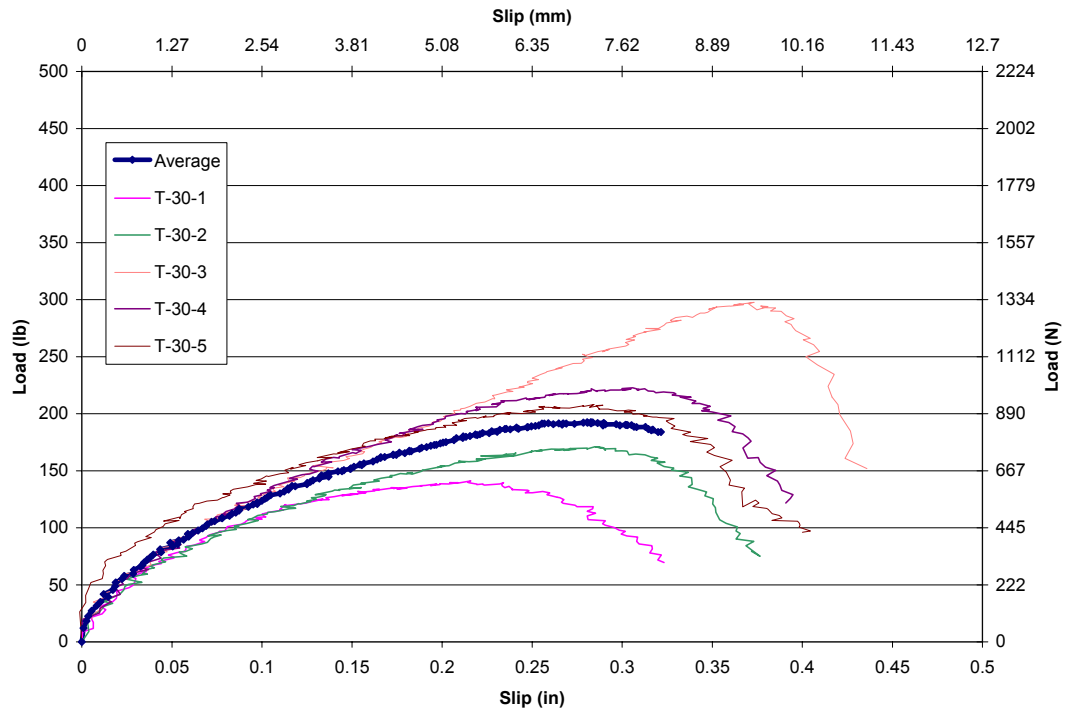


Figure A3.3: Pressure Duration Load-Displacement Curves – 414kPa (60psi) for 30 seconds

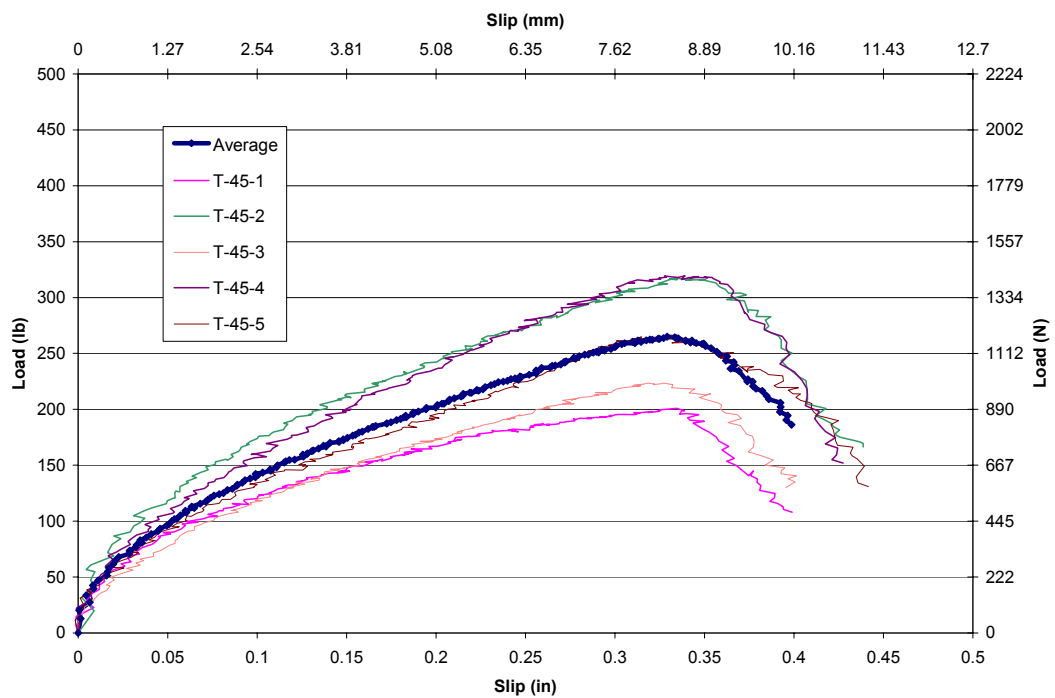


Figure A3.4: Pressure Duration Load-Displacement Curves – 414kPa (60psi) for 45 seconds

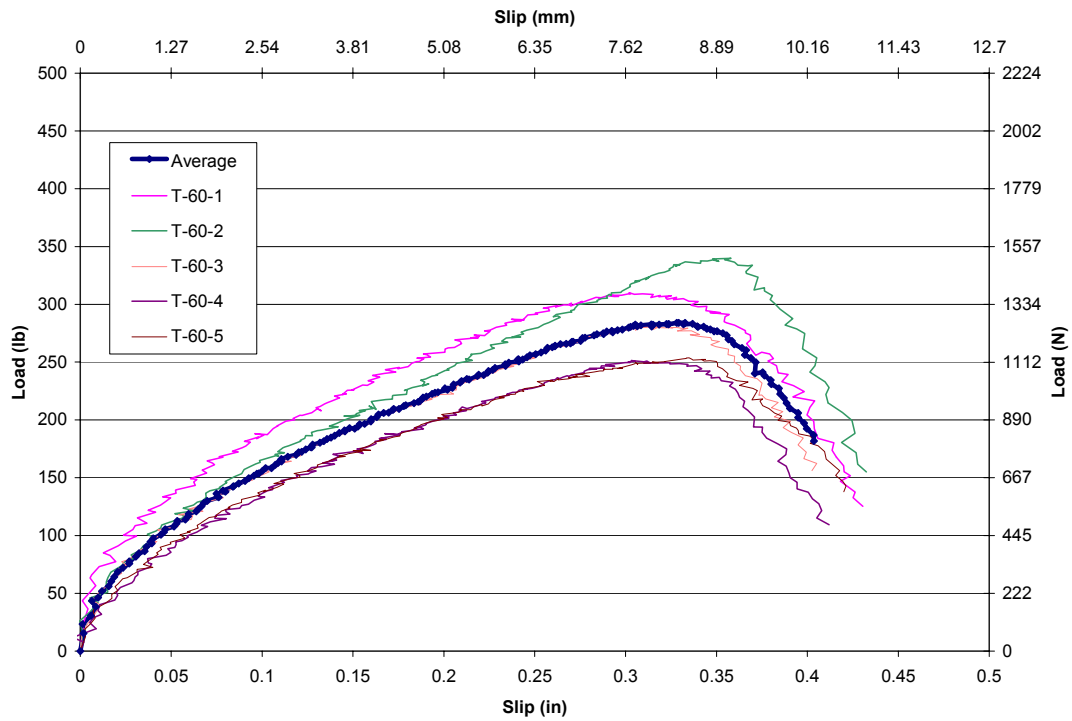


Figure A3.5: Pressure Duration Load-Displacement Curves – 414kPa (60psi) for 60 seconds

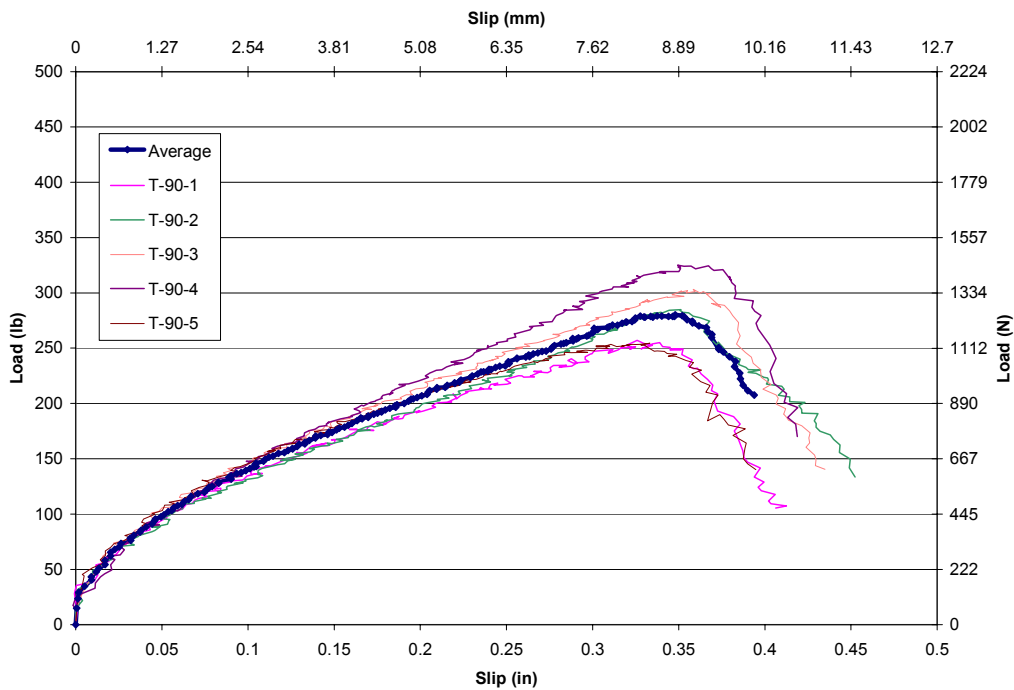


Figure A3.6: Pressure Duration Load-Displacement Curves – 414kPa (60psi) for 90 seconds

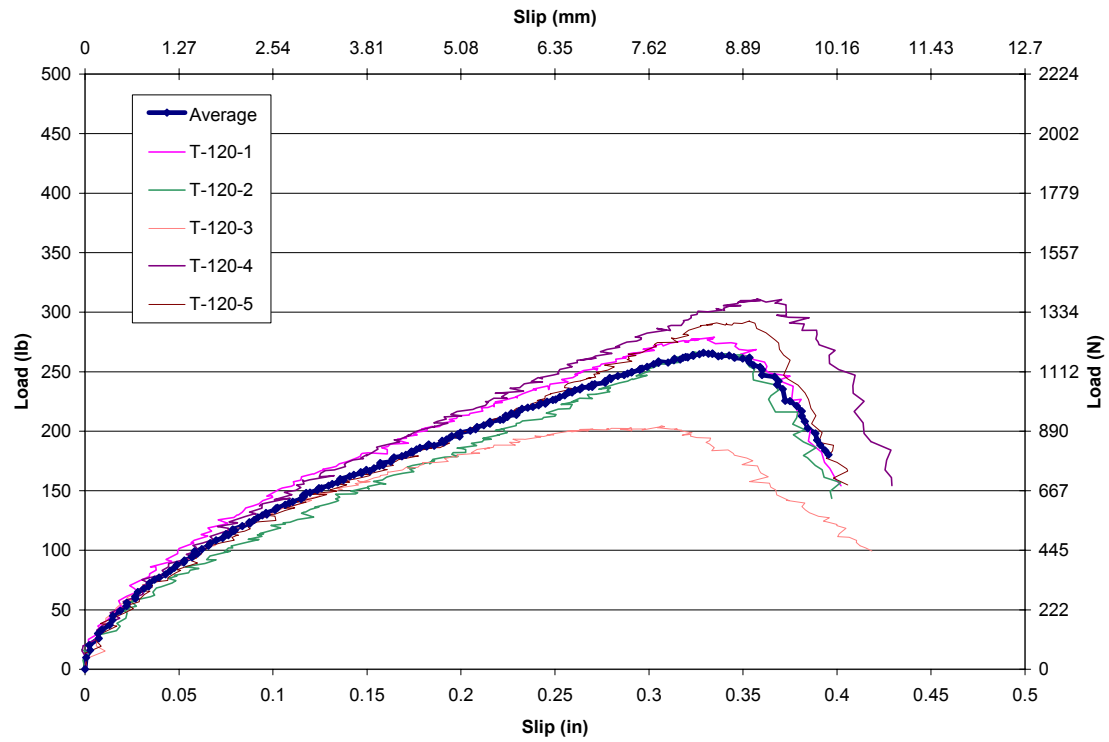


Figure A3.7: Pressure Duration Load-Displacement Curves – 414kPa (60psi) for 120 seconds

Appendix A4: Main (Statistically Significant) Connection Test Data



Bond Failure

Table A4.1a: Statistically Significant Performance Parameter Summary (US Customary Units)

OVERALL AVERAGE RESULTS (US Customary Units)												
Data Set	S-OA	S-OAS	S-OAP	S-OAN	S-ON	S-PA	S-PAN	S-PN	S-PMT1	S-PMT2	S-PMT3	
Max Load (lbs)=	222.5	360.5	445.9	473.8	213.4	339.3	592.9	163.0	293.2	251.3	237.1	
Displacement (in)=	0.271	0.368	0.358	0.306	0.291	0.389	0.359	0.248	0.333	0.291	0.106	
Failure Load (lbs)=	176.0	284.2	349.9	373.8	N / A	268.3	467.4	N / A	230.1	195.2	181.2	
Disp. @ Failure (in)=	0.347	0.410	0.393	0.363	N / A	0.427	0.399	N / A	0.369	0.318	0.127	
40% Max (lbs)=	87.5	142.703	177.1	186.2	73.1	134.9	234.9	60.5	115.7	99.3	91.1	
Displacement (in)=	0.034	0.088	0.098	0.031	0.008	0.090	0.062	0.011	0.065	0.100	0.035	
Yield (lbs)=	188.8	292.9	368.2	399.2	196.0	273.7	476.4	149.4	240.4	225.9	224.5	
Displacement (in)=	0.075	0.181	0.204	0.067	0.019	0.183	0.126	0.025	0.135	0.224	0.086	
5% Offset Yield=	127.0	186.0	234.0	266.7	159.3	167.5	304.8	121.2	153.7	178.8	225.9	
Displacement (in)=	0.079	0.142	0.157	0.073	0.044	0.140	0.108	0.049	0.113	0.213	0.115	
Elastic Stiffness (lb/in)=	2831.4	1642.6	1845.2	6214.6	20680.2	1504.4	3857.7	9363.5	1808.2	1010.6	2701.2	
Energy (lb*in)=	59.1	93.2	106.9	131.5	96.5	90.7	158.1	72.7	72.3	45.8	19.0	
Ductility Ratio=	5.42	2.33	1.98	5.70	49.24	2.42	3.25	31.92	2.89	1.54	1.54	

NOTE: Nail-Only Sets did not fail within the time limit of the experiment

Data Set KEY	
S-OA:	OSB bonded to SPF - Adhesive Only
S-OAS:	Pre-Sanded OSB bonded to SPF - Adhesive Only
S-OAP:	Primed (Generic) OSB bonded to SPF - Adhesive Only
S-OAN:	OSB bonded to SPF - Adhesive + 8d Nail
S-ON:	OSB attached to SPF - 8d Nail Only
S-PA:	Plywood bonded to SPF - Adhesive Only
S-PAN:	Plywood bonded to SPF - Adhesive + 8d Nail
S-PN:	Plywood attached to SPF - Nail Only
S-PMT1:	Plywood bonded to Primed SPF - Manufacturer 1 Adhes
S-PMT2:	Plywood bonded to Primed SPF - Manufacturer 1 Adhes
S-PMT3:	Plywood bonded to Primed SPF - Manufacturer 1 Adhes

Table A4.1b: Statistically Significant Performance Parameter Summary (Metric)

OVERALL AVERAGE RESULTS (Metric)												
Data Set	S-OA	S-OAS	S-OAP	S-OAN	S-ON	S-PA	S-PAN	S-PN	S-PMT1	S-PMT2	S-PMT3	
Max Load (N)=	990.0	1603.7	1983.4	2107.4	949.5	1509.2	2637.3	724.9	1304.4	1118.0	1054.6	
Displacement (mm)=	6.88	9.35	9.10	7.78	7.40	9.88	9.13	6.31	8.45	7.40	2.68	
Failure Load (N)=	782.9	1264.2	1556.4	1662.8	N / A	1193.4	2079.2	N / A	1023.5	868.2	806.0	
Disp. @ Failure (mm)=	8.81	10.41	9.99	9.22	N / A	10.84	10.13	N / A	9.36	8.08	3.23	
40% Max (N)=	389.0	142.703	787.8	828.2	325.4	600.0	1045.0	269.2	514.8	441.9	405.1	
Displacement (mm)=	0.875	2.245	2.486	0.799	0.195	2.296	1.576	0.268	1.645	2.550	0.887	
Yield (N)=	840.0	1303.0	1638.0	1775.6	871.9	1217.4	2119.1	664.6	1069.5	1004.8	998.5	
Displacement (mm)=	1.895	4.607	5.174	1.707	0.495	4.655	3.195	0.647	3.418	5.677	2.183	
5% Offset Yield (N)=	565.0	827.4	1041.0	1186.5	708.8	745.3	1356.0	539.1	683.7	795.3	1004.6	
Displacement (mm)=	2.001	3.618	3.992	1.850	1.107	3.555	2.742	1.233	2.863	5.417	2.911	
Elastic Stiffness (N/mm)=	495.9	287.7	323.1	1088.3	3621.7	263.5	675.6	1639.8	316.7	177.0	473.0	
Energy (N*m)=	6.68	10.53	12.07	14.85	10.90	10.25	17.86	8.21	8.17	5.18	2.15	
Ductility Ratio=	5.42	2.33	1.98	5.70	49.24	2.42	3.25	31.92	2.89	1.54	1.54	

NOTE: Nail-Only Sets did not fail within the time limit of the experiment

Data Set KEY	
S-OA:	OSB bonded to SPF - Adhesive Only
S-OAS:	Pre-Sanded OSB bonded to SPF - Adhesive Only
S-OAP:	Primed (Generic) OSB bonded to SPF - Adhesive Only
S-OAN:	OSB bonded to SPF - Adhesive + 8d Nail
S-ON:	OSB attached to SPF - 8d Nail Only
S-PA:	Plywood bonded to SPF - Adhesive Only
S-PAN:	Plywood bonded to SPF - Adhesive + 8d Nail
S-PN:	Plywood attached to SPF - Nail Only
S-PMT1:	Plywood bonded to Primed SPF - Manufacturer 1 Adhes
S-PMT2:	Plywood bonded to Primed SPF - Manufacturer 1 Adhes
S-PMT3:	Plywood bonded to Primed SPF - Manufacturer 1 Adhes

Table A4.2a: S-OA Series Performance Parameters (US Customary Units)

Data Set: S-OA																		
Sample	Average	StDev	C.O.V.	S-OA-1	S-OA-2	S-OA-3	S-OA-4	S-OA-5	S-OA-6	S-OA-7	Bad Test	S-OA-9	S-OA-10	S-OA-11	S-OA-12	S-OA-13	S-OA-14	S-OA-15
Max Load (lbs)= Displacement (in)=	222.5	47.6	21.4	266.1	250.9	299.1	171.0	254.1	229.7	181.7		231.0	143.5	195.5	164.3	304.3	227.4	197.2
	0.271	0.055	20.1	0.300	0.347	0.317	0.207	0.321	0.273	0.218		0.240	0.179	0.244	0.246	0.359	0.320	0.219
Failure Load (lbs)= Disp. @ Failure (in)=	176.0	37.6	21.4	203.7	200.3	236.4	135.5	202.5	183.2	142.2		182.3	114.5	154.5	128.3	241.9	181.6	157.1
	0.347	0.037	10.8	0.372	0.403	0.381	0.311	0.360	0.323	0.306		0.334	0.319	0.313	0.311	0.398	0.409	0.315
40% Max (lbs)= Displacement (in)=	87.5	19.3	22.1	105.6	99.4	117.9	67.5	101.0	90.5	68.4		90.9	57.1	75.6	65.2	121.0	89.3	75.0
	0.034	0.013	37.5	0.044	0.055	0.034	0.028	0.035	0.022	0.036		0.043	0.012	0.032	0.015	0.057	0.044	0.026
Yield (lbs)= Displacement (in)=	188.8	35.9	19.0	227.8	214.3	246.5	153.4	206.3	191.0	160.4		198.2	125.9	169.9	140.5	243.4	196.5	169.5
	0.075	0.027	36.2	0.095	0.119	0.071	0.063	0.072	0.046	0.085		0.093	0.026	0.072	0.033	0.114	0.097	0.059
5% Offset Yield= Displacement (in)=	127.0	18.6	14.7	152.6	138.4	141.5	110.9	121.3	123.0	129.5		137.7	104.0	124.3	85.3	160.3	129.1	120.2
	0.079	0.016	20.5	0.089	0.103	0.066	0.071	0.071	0.058	0.098		0.091	0.063	0.078	0.054	0.101	0.093	0.068
Elastic Stiffness (lb/in)= Energy (lb*in)=	2831.42	933.31	33.0	2399.34	1794.98	3478.32	2447.12	2877.85	4114.19	1879.27		2127.76	4796.33	2370.17	4288.61	2141.70	2030.24	2894.00
	59.14	15.67	26.5	73.84	73.62	85.23	42.84	66.80	57.26	42.29		56.99	38.46	47.06	41.31	83.00	70.85	48.38
Ductility Ratio=	5.42	2.45	45.2	3.91	3.38	5.38	4.95	5.02	6.96	3.59		3.59	12.15	4.36	9.48	3.50	4.22	5.37

Table A4.2b: S-OA Series Performance Parameters (Metric Units)

S-OA																		
Sample	Average	StdDev	C.O.V.	S-OA-1	S-OA-2	S-OA-3	S-OA-4	S-OA-5	S-OA-6	S-OA-7	Bad Test	S-OA-9	S-OA-10	S-OA-11	S-OA-12	S-OA-13	S-OA-14	S-OA-15
Max Load (N)=	990.0	211.8	21.4	1183.7	1115.9	1330.6	760.5	1130.2	1021.7	808.4		1027.4	638.3	869.8	730.6	1353.5	1011.7	877.0
	Displacement (mm)=	6.876	1.385	20.1	7.623	8.804	8.047	5.263	8.164	6.944	5.542		6.106	4.534	6.198	6.259	9.111	5.560
Failure Load (N)=	782.9	167.4	21.4	906.0	890.8	1051.7	602.6	900.6	814.9	632.5		811.0	509.3	687.5	570.5	1076.0	807.9	698.9
	Disp. @ Failure (mm)=	8.805	0.950	10.8	9.439	10.241	9.682	7.889	9.136	8.207	7.780		8.486	8.095	7.945	7.887	10.107	10.366
40% Max (N)=	389.0	85.8	22.1	469.6	442.3	524.5	300.4	449.3	402.6	304.3		404.1	253.9	336.3	290.0	538.3	397.4	333.4
	Displacement (mm)=	0.875	0.328	37.5	1.118	1.407	0.861	0.892	0.559	0.925		1.085	0.302	0.810	0.386	1.435	1.118	0.658
Yield (N)=	840.0	159.6	19.0	1013.4	953.4	1096.5	682.4	917.5	849.4	713.7		881.7	559.8	755.8	624.8	1082.8	874.2	754.0
	Displacement (mm)=	1.895	0.686	36.2	2.412	3.033	1.800	1.592	1.820	1.179	2.169		2.366	0.666	1.821	0.832	2.887	2.459
5% Offset Yield (N)=	565.0	82.9	14.7	678.7	615.8	629.5	493.4	539.6	547.0	576.0		612.5	462.5	553.0	379.4	713.0	574.4	534.7
	Displacement (mm)=	2.001	0.411	20.5	2.261	2.624	1.676	1.791	1.808	1.476	2.489		2.306	1.598	1.974	1.359	2.576	2.360
Elastic Stiffness (N/mm)=	495.86	163.45	33.0	420.19	314.35	609.15	428.56	503.99	720.50	329.11		372.63	839.97	415.08	751.05	375.07	355.55	506.82
	Energy (N*m)=	6.68	1.77	26.5	8.34	8.32	9.63	4.84	7.55	6.47	4.78		6.44	4.35	5.32	4.67	9.38	8.00
Ductility Ratio=	5.42	2.45	45.2	3.91	3.38	5.38	4.95	5.02	6.96	3.59		3.59	12.15	4.36	9.48	3.50	4.22	5.37

Table A4.3a: S-OAS Series Performance Parameters (US Customary Units)

Data Set: S-OAS																		
Sample	Average	StDev	C.O.V.	S-OAS-1	S-OAS-2	S-OAS-3	S-OAS-4	S-OAS-5	S-OAS-6	S-OAS-7	S-OAS-8	S-OAS-9	S-OAS-10	S-OAS-11	S-OAS-12	S-OAS-13	S-OAS-14	S-OAS-15
Max Load (lbs)=	360.5	45.93	12.7	417.5	435.7	400.9	285.4	378.9	294.2	316.1	352.8	346.2	326.9	344.6	422.6	408.8	339.1	338.6
Displacement (in)=	0.368	0.02	6.0	0.365	0.393	0.368	0.355	0.377	0.312	0.339	0.379	0.392	0.361	0.355	0.394	0.399	0.370	0.364
Failure Load (lbs)=	284.2	35.73	12.6	332.3	339.9	316.5	224.8	298.6	233.6	249.9	275.0	275.6	256.4	271.3	333.2	319.2	268.7	268.3
Disp. @ Failure (in)=	0.410	0.02	4.5	0.396	0.429	0.408	0.385	0.406	0.363	0.403	0.409	0.433	0.408	0.413	0.426	0.431	0.428	0.411
40% Max (lbs)=	142.7	18.53	13.0	164.3	172.4	160.1	113.8	150.2	113.9	124.1	140.9	137.8	130.2	137.6	168.7	161.1	131.3	134.0
Displacement (in)=	0.088	0.02	17.8	0.108	0.099	0.102	0.094	0.105	0.061	0.081	0.094	0.072	0.079	0.081	0.101	0.110	0.062	0.077
Yield (lbs)=	292.9	35.44	12.1	344.4	348.5	324.7	232.8	309.2	250.7	263.5	282.5	277.0	267.9	281.3	338.0	331.0	271.3	270.9
Displacement (in)=	0.181	0.03	17.3	0.227	0.200	0.206	0.192	0.216	0.134	0.172	0.189	0.144	0.163	0.165	0.203	0.227	0.128	0.155
5% Offset Yield=	186.0	22.23	12.0	227.1	209.7	199.1	147.2	205.9	171.7	172.6	172.8	170.0	176.1	184.9	212.7	209.9	161.3	169.3
Displacement (in)=	0.142	0.02	14.7	0.178	0.145	0.152	0.147	0.173	0.123	0.139	0.143	0.117	0.133	0.134	0.160	0.169	0.102	0.122
Elastic Stiffness (lb/in)=	1642.6	216.15	13.2	1518.94	1746.89	1574.02	1211.06	1432.02	1874.00	1527.80	1492.07	1922.45	1642.14	1705.50	1669.05	1460.33	2114.25	1749.14
Energy (lb*in)=	93.2	12.00	12.9	97.24	114.29	99.02	67.28	92.25	74.19	83.37	88.68	99.13	87.51	92.98	109.69	105.21	97.69	90.08
Ductility Ratio=	2.3	0.44	18.7	1.75	2.15	1.98	2.00	1.88	2.71	2.33	2.16	3.00	2.50	2.50	2.10	1.90	3.34	2.66

Table A4.3b: S-OAS Series Performance Parameters (Metric Units)

S-OAS																		
Sample	Average	StDev	C.O.V.	S-OAS-1	S-OAS-2	S-OAS-3	S-OAS-4	S-OAS-5	S-OAS-6	S-OAS-7	S-OAS-8	S-OAS-9	S-OAS-10	S-OAS-11	S-OAS-12	S-OAS-13	S-OAS-14	S-OAS-15
Max Load (N)= Displacement (mm)=	1603.7	204.3	12.7	1857.0	1937.9	1783.2	1289.3	1685.2	1308.5	1406.1	1569.1	1540.1	1453.9	1533.0	1879.6	1818.5	1508.4	1506.4
	9.350	0.563	6.0	9.271	9.975	9.335	9.022	9.571	7.935	8.603	9.619	9.954	9.174	9.007	10.008	10.135	9.390	9.256
Failure Load (N)= Disp. @ Failure (mm)=	1264.2	158.9	12.6	1478.2	1512.1	1408.0	999.8	1328.3	1039.2	1111.8	1223.0	1226.0	1140.4	1206.8	1482.0	1419.7	1195.0	1193.3
	10.412	0.466	4.5	10.051	10.904	10.366	9.782	10.320	9.215	10.226	10.378	10.991	10.368	10.490	10.815	10.952	10.874	10.447
40% Max (N)= Displacement (mm)=	634.8	82.4	13.0	731.1	767.0	712.1	506.4	688.2	506.8	551.8	626.5	613.1	579.3	612.2	750.6	716.5	584.0	596.0
	2.245	0.400	17.8	2.748	2.507	2.583	2.388	2.664	1.544	2.062	2.398	1.821	2.014	2.050	2.568	2.802	1.577	1.946
Yield (N)= Displacement (mm)=	1303.0	157.6	12.1	1532.0	1550.3	1444.2	1035.6	1375.5	1115.3	1172.3	1256.5	1232.1	1191.8	1251.3	1503.7	1472.3	1206.7	1205.1
	4.607	0.796	17.3	5.759	5.068	5.239	4.883	5.485	3.398	4.381	4.809	3.660	4.144	4.190	5.144	5.757	3.259	3.934
5% Offset Yield (N)= Displacement (mm)=	827.4	98.9	12.0	1010.1	933.0	885.7	654.6	915.7	763.7	767.7	788.6	756.0	783.5	822.4	946.0	933.5	717.5	752.9
	3.618	0.532	14.7	4.509	3.691	3.851	3.731	4.399	3.122	3.520	3.642	2.959	3.376	3.409	4.072	4.295	2.598	3.101
Elastic Stiffness (N/mm)=	287.67	37.85	13.2	266.01	305.93	275.65	212.09	250.78	328.19	267.56	261.30	336.67	287.58	298.68	292.29	255.74	370.26	306.32
Energy (N*m)=	10.53	1.36	12.9	10.99	12.91	11.19	7.60	10.42	8.38	9.42	10.02	11.20	9.89	10.51	12.39	11.89	11.04	10.18
Ductility Ratio=	2.33	0.44	18.7	1.75	2.15	1.98	2.00	1.88	2.71	2.33	2.16	3.00	2.50	2.50	2.10	1.90	3.34	2.66

Table A4.4a: S-OAP Series Performance Parameters (US Customary Units)

Data Set: S-OAP																		
Sample	Average	StDev	C.O.V.	S-OAP-1	S-OAP-2	S-OAP-3	S-OAP-4	S-OAP-5	S-OAP-6	S-OAP-7	S-OAP-8	S-OAP-9	S-OAP-10	S-OAP-11	S-OAP-12	S-OAP-13	S-OAP-14	S-OAP-15
Max Load (lbs)= Displacement (in)=	445.9	31.33	7.0	484.7	435.2	468.8	412.8	476.0	448.7	452.4	386.3	433.6	388.4	463.8	461.6	461.0	492.5	422.6
	0.358	0.01	3.5	0.358	0.373	0.369	0.341	0.349	0.363	0.366	0.355	0.358	0.344	0.347	0.379	0.336	0.361	0.377
Failure Load (lbs)= Disp. @ Failure (in)=	349.9	23.49	6.7	374.8	340.1	365.7	325.7	368.6	349.0	350.1	307.3	342.8	305.2	361.8	367.0	359.6	392.8	337.8
	0.393	0.01	3.1	0.388	0.403	0.416	0.377	0.397	0.390	0.397	0.404	0.395	0.381	0.382	0.403	0.367	0.393	0.404
40% Max (lbs)= Displacement (in)=	177.1	12.42	7.0	193.3	173.7	186.9	164.1	187.5	178.4	180.5	152.4	173.2	154.5	183.1	182.2	182.9	195.5	168.3
	0.098	0.01	14.2	0.095	0.118	0.115	0.097	0.091	0.103	0.110	0.089	0.102	0.060	0.085	0.098	0.089	0.106	0.110
Yield (lbs)= Displacement (in)=	368.2	30.22	8.2	401.5	381.8	399.7	348.9	393.8	358.9	366.2	312.3	352.8	310.7	374.9	369.3	388.1	419.6	345.0
	0.204	0.03	15.5	0.197	0.259	0.245	0.206	0.191	0.207	0.224	0.182	0.207	0.122	0.174	0.199	0.188	0.228	0.226
5% Offset Yield= Displacement (in)=	234.0	24.45	10.4	246.1	271.7	269.6	228.9	245.7	228.9	242.1	201.5	224.5	185.3	216.5	218.8	263.0	256.1	211.8
	0.157	0.02	15.6	0.149	0.210	0.191	0.161	0.145	0.161	0.178	0.144	0.160	0.101	0.129	0.144	0.153	0.166	0.166
Elastic Stiffness (lb/in)=	1845.2	275.37	14.9	2035.11	1474.66	1628.24	1696.60	2062.64	1730.41	1635.22	1712.05	1703.36	2557.38	2159.27	1851.76	2060.09	1842.75	1528.28
Energy (lb*n)=	106.87	7.52	7.0	116.34	104.55	117.26	95.59	118.72	102.44	104.31	97.65	102.89	98.29	110.74	110.84	105.99	117.05	100.41
Ductility Ratio=	1.98	0.36	18.0	1.97	1.56	1.69	1.83	2.08	1.88	1.77	2.21	1.91	3.14	2.20	2.02	1.95	1.72	1.79

Table A4.4b: S-OAP Series Performance Parameters (Metric Units)

S-OAP																		
Sample	Average	StDev	C.O.V.	SOAP-1	SOAP-2	SOAP-3	SOAP-4	SOAP-5	SOAP-6	SOAP-7	SOAP-8	SOAP-9	SOAP-10	SOAP-11	SOAP-12	SOAP-13	SOAP-14	SOAP-15
Max Load (N)= Displacement (mm)=	1983.4	139.3	7.0	2156.1	1936.0	2085.3	1836.0	2117.2	1995.7	2012.6	1718.1	1928.6	1727.7	2063.3	2053.2	2050.6	2190.6	1879.8
	9.103	0.319	3.5	9.091	9.477	9.370	8.672	8.867	9.223	9.294	9.004	9.098	8.745	8.814	9.614	8.534	9.174	9.563
Failure Load (N)= Disp. @ Failure (mm)=	1556.4	104.5	6.7	1667.4	1512.7	1626.5	1448.9	1639.7	1552.3	1557.4	1367.2	1525.1	1357.7	1609.3	1632.6	1599.5	1747.3	1502.7
	9.987	0.309	3.1	9.865	10.244	10.569	9.571	10.081	9.909	10.079	10.259	10.038	9.688	9.708	10.236	9.329	9.977	10.259
40% Max (N)= Displacement (mm)=	787.8	55.3	7.0	860.0	772.7	831.5	729.8	834.0	793.6	803.0	677.8	770.6	687.1	814.5	810.5	813.7	869.7	748.5
	2.486	0.353	14.2	2.413	2.992	2.916	2.456	2.309	2.619	2.804	2.261	2.583	1.534	2.154	2.499	2.256	2.695	2.797
Yield (N)= Displacement (mm)=	1638.0	134.4	8.2	1786.0	1698.3	1778.0	1551.8	1751.9	1596.6	1629.0	1399.2	1569.2	1382.2	1667.5	1642.6	1726.4	1866.7	1534.8
	5.174	0.800	15.5	5.011	6.576	6.235	5.223	4.850	5.268	5.688	4.633	5.261	3.086	4.410	5.065	4.785	5.784	5.734
5% Offset Yield (N)= Displacement (mm)=	1041.0	108.8	10.4	1094.5	1208.6	1199.1	1018.1	1093.1	1018.2	1077.0	896.4	998.4	824.5	963.1	973.1	1170.1	1139.3	941.9
	3.992	0.623	15.6	3.787	5.324	4.856	4.079	3.691	4.084	4.531	3.655	4.067	2.568	3.284	3.650	3.894	4.204	4.209
Elastic Stiffness (N/mm)=	323.14	48.22	14.9	356.40	258.25	285.15	297.12	361.22	303.04	286.37	299.83	298.30	447.87	378.15	324.29	360.78	322.71	267.64
Energy (N*m)=	12.07	0.85	7.0	13.14	11.81	13.25	10.80	13.41	11.57	11.78	11.03	11.62	11.11	12.51	12.52	11.98	13.23	11.34
Ductility Ratio=	1.98	0.36	18.0	1.97	1.56	1.69	1.83	2.08	1.88	1.77	2.21	1.91	3.14	2.20	2.02	1.95	1.72	1.79

Table A4.5a: S-OAN Series Performance Parameters (US Customary Units)

Data Set: S-OAN																		
Sample	Average	StDev	C.O.V.	S-OAN-1	S-OAN-2	S-OAN-3	S-OAN-4	S-OAN-5	S-OAN-6	S-OAN-7	S-OAN-8	S-OAN-9	S-OAN-10	S-OAN-11	S-OAN-12	S-OAN-13	S-OAN-14	S-OAN-15
Max Load (lbs)= Displacement (in)=	473.8	49.3	10.4	494.7	455.0	451.8	423.7	388.2	418.7	544.4	445.1	548.6	473.1	553.7	525.0	430.3	476.0	478.0
	0.306	0.028	9.1	0.324	0.258	0.275	0.310	0.289	0.258	0.336	0.277	0.346	0.332	0.311	0.334	0.328	0.314	0.302
Failure Load (lbs)= Disp. @ Failure (in)=	373.8	38.4	10.3	388.3	357.7	357.7	332.0	309.4	333.2	426.3	354.9	434.9	378.0	439.5	412.8	341.0	371.7	369.5
	0.363	0.015	4.0	0.358	0.325	0.350	0.362	0.352	0.354	0.368	0.361	0.385	0.376	0.380	0.368	0.378	0.356	0.373
40% Max (lbs)= Displacement (in)=	186.2	20.2	10.9	193.1	180.5	173.6	165.1	149.3	167.4	217.3	173.5	216.1	185.8	215.8	208.7	168.4	188.7	189.3
	0.031	0.008	26.4	0.035	0.023	0.027	0.029	0.019	0.026	0.049	0.032	0.042	0.031	0.045	0.033	0.030	0.030	0.020
Yield (lbs)= Displacement (in)=	399.2	34.6	8.7	409.6	393.6	389.3	361.1	333.1	367.4	447.8	382.1	442.4	384.2	450.5	448.5	367.9	399.5	410.8
	0.067	0.016	24.1	0.074	0.051	0.061	0.064	0.042	0.057	0.101	0.070	0.085	0.064	0.094	0.072	0.066	0.064	0.042
5% Offset Yield= Displacement (in)=	266.7	22.1	8.3	289.4	260.0	258.3	252.1	223.7	254.9	303.5	256.7	278.5	252.8	292.0	303.1	240.2	266.9	268.9
	0.073	0.011	15.2	0.080	0.059	0.068	0.075	0.054	0.071	0.099	0.075	0.079	0.068	0.088	0.077	0.074	0.070	0.057
Elastic Stiffness (lb/in)=	6214.59	1306.34	21.0	5516.59	7714.30	6383.53	5654.90	7942.21	6438.82	4443.49	5421.86	5195.77	5992.36	4796.13	6249.76	5557.16	6206.38	9705.53
Energy (lb*in)=	131.45	12.61	9.6	131.39	117.99	124.38	119.27	110.11	119.42	142.18	124.27	151.26	132.18	149.81	149.01	126.71	129.17	144.64
Ductility Ratio=	5.70	1.35	23.7	4.82	6.38	5.74	5.67	8.38	6.20	3.65	5.12	4.52	5.87	4.04	5.13	5.70	5.52	8.82

Table A4.5b: S-OAN Series Performance Parameters (Metric Units)

S-OAN																		
Sample	Average	StDev	C.O.V.	S-OAN-1	S-OAN-2	S-OAN-3	S-OAN-4	S-OAN-5	S-OAN-6	S-OAN-7	S-OAN-8	S-OAN-9	S-OAN-10	S-OAN-11	S-OAN-12	S-OAN-13	S-OAN-14	S-OAN-15
Max Load (N)= Displacement (mm)=	2107.4	219.4	10.4	2200.6	2024.0	2009.6	1894.5	1726.8	1862.4	2421.6	1979.9	2440.4	2104.5	2463.2	2335.2	1914.2	2117.3	2126.1
	7.778	0.707	9.1	8.237	6.546	6.975	7.879	7.333	6.563	8.527	7.031	8.796	8.428	7.902	8.476	8.336	7.978	7.658
Failure Load (N)= Disp. @ Failure (mm)=	1662.8	170.6	10.3	1727.3	1591.3	1591.2	1476.8	1376.4	1482.0	1896.4	1578.8	1934.6	1681.5	1955.0	1836.2	1517.0	1653.5	1643.7
	9.217	0.369	4.0	9.091	8.263	8.890	9.200	8.928	8.981	9.345	9.157	9.766	9.553	9.639	9.350	9.589	9.030	9.482
40% Max (N)= Displacement (mm)=	828.2	90.0	10.9	858.9	803.0	772.4	734.5	664.2	744.7	966.5	771.8	961.5	826.3	960.0	928.5	749.0	839.3	841.9
	0.799	0.211	26.4	0.889	0.594	0.691	0.742	0.478	0.660	1.242	0.813	1.057	0.787	1.143	0.848	0.770	0.772	0.495
Yield (N)= Displacement (mm)=	1775.6	154.0	8.7	1822.1	1750.7	1731.6	1606.4	1481.9	1634.1	1991.8	1699.5	1967.8	1708.9	2003.9	1995.1	1636.5	1777.2	1827.1
	1.707	0.411	24.1	1.886	1.296	1.549	1.622	1.065	1.449	2.560	1.790	2.163	1.628	2.386	1.823	1.682	1.635	1.075
5% Offset Yield (N)= Displacement (mm)=	1186.5	98.1	8.3	1287.5	1156.5	1148.9	1121.4	994.9	1134.0	1350.1	1141.8	1238.9	1124.7	1299.0	1348.2	1068.6	1187.3	1196.3
	1.850	0.282	15.2	2.035	1.496	1.732	1.892	1.377	1.793	2.507	1.900	2.017	1.727	2.223	1.953	1.869	1.765	1.458
Elastic Stiffness (N/mm)=	1088.34	228.78	21.0	966.10	1350.98	1117.93	990.33	1390.89	1127.61	778.17	949.51	909.92	1049.42	839.93	1094.50	973.21	1086.90	1699.70
Energy (N*m)=	14.85	1.43	9.6	14.85	13.33	14.05	13.48	12.44	13.49	16.06	14.04	17.09	14.93	16.93	16.84	14.32	14.59	16.34
Ductility Ratio=	5.70	1.35	23.7	4.82	6.38	5.74	5.67	8.38	6.20	3.65	5.12	4.52	5.87	4.04	5.13	5.70	5.52	8.82

Table A4.6a: S-ON Series Performance Parameters (US Customary Units)

Data Set: S-ON																		
Sample	Average	StDev	C.O.V.	S-ON-1	S-ON-2	S-ON-3	S-ON-4	S-ON-5	S-ON-6	S-ON-7	S-ON-8	S-ON-9	S-ON-10	S-ON-11	S-ON-12	S-ON-13	Bad Test	S-ON-15
Max Load (lbs)=	213.4	35.3	16.6	238.2	194.8	209.9	285.1	242.2	231.8	237.8	224.1	236.6	156.2	184.2	210.5	149.0		187.6
	0.291	0.134	45.9	0.265	0.409	0.490	0.245	0.350	0.495	0.475	0.138	0.212	0.042	0.222	0.270	0.311		0.156
Failure Load (lbs)=	198.0	34.7	17.5	230.9	189.7	207.6	254.8	227.2	227.3	235.7	198.0	203.0	149.2	159.7	192.2	134.1		162.8
	0.501	0.005	1.0	0.504	0.492	0.500	0.501	0.497	0.499	0.509	0.498	0.497	0.506	0.502	0.512	0.503		0.500
40% Max (lbs)=	73.1	15.4	21.0	51.4	75.5	76.5	84.6	77.8	85.4	95.0	70.3	93.2	36.4	68.0	78.4	58.1		73.4
	0.008	0.007	87.4	0.002	0.008	0.008	0.003	0.003	0.004	0.002	0.002	0.001	0.004	0.012	0.020	0.020		0.018
Yield (lbs)=	196.0	32.6	16.6	228.3	178.4	190.1	261.3	225.8	206.9	216.9	204.0	214.7	147.8	169.4	193.0	134.2		173.3
	0.019	0.015	78.9	0.009	0.018	0.021	0.009	0.008	0.010	0.005	0.006	0.003	0.016	0.029	0.050	0.045		0.043
5% Offset Yield=	159.3	35.0	22.0	220.9	130.4	150.2	210.6	198.3	183.5	173.8	160.1	183.8	150.6	136.4	140.4	85.6		126.1
	0.044	0.011	24.5	0.039	0.038	0.043	0.034	0.035	0.036	0.039	0.030	0.035	0.044	0.050	0.066	0.057		0.063
Elastic Stiffness (lb/in)=	20680	17665	85.4	25707.2	9799.8	9108.2	28206.5	28807.2	20329.2	43184.5	31957.1	66591.9	9095.0	5859.8	3881.0	2981.5		4013.5
Energy (lb*in)=	96.51	16.94	17.6	114.07	86.15	93.05	129.64	111.38	102.28	109.90	100.93	106.39	73.52	82.64	94.00	64.44		82.82
Ductility Ratio=	49.24	39.38	80.0	56.74	27.02	23.95	54.06	63.43	49.06	101.34	78.02	154.24	31.12	17.37	10.29	11.17		11.57

Table A4.6b: S-ON Series Performance Parameters (Metric Units)

S-ON																		
Sample	Average	StDev	C.O.V.	S-ON-1	S-ON-2	S-ON-3	S-ON-4	S-ON-5	S-ON-6	S-ON-7	S-ON-8	S-ON-9	S-ON-10	S-ON-11	S-ON-12	S-ON-13	Bad Test	S-ON-15
Max Load (N)= Displacement (mm)=	949.5	157.2	16.6	1059.7	866.6	933.7	1268.3	1077.5	1031.1	1057.8	996.9	1052.6	694.8	819.3	936.5	662.7		834.6
	7.400	3.400	45.9	6.731	10.389	12.449	6.210	8.885	12.581	12.057	3.505	5.377	1.062	5.646	6.848	7.892		3.967
Failure Load (N)= Disp. @ Failure (mm)=	880.8	154.2	17.5	1026.9	843.9	923.4	1133.3	1010.7	1011.3	1048.4	880.9	903.0	663.8	710.2	855.1	596.7		724.1
	12.735	0.126	1.0	12.802	12.494	12.697	12.720	12.629	12.685	12.931	12.649	12.629	12.842	12.756	13.002	12.769		12.687
40% Max (N)= Displacement (mm)=	325.4	68.4	21.0	228.7	335.7	340.3	376.4	346.0	379.8	422.6	312.7	414.7	161.8	302.4	348.7	258.6		326.7
	0.195	0.170	87.4	0.051	0.196	0.213	0.076	0.069	0.107	0.056	0.056	0.036	0.102	0.295	0.513	0.495		0.465
Yield (N)= Displacement (mm)=	871.9	145.0	16.6	1015.7	793.7	845.6	1162.3	1004.4	920.4	965.0	907.4	954.9	657.4	753.7	858.6	596.9		770.8
	0.495	0.391	78.9	0.226	0.462	0.530	0.235	0.199	0.259	0.128	0.162	0.082	0.413	0.734	1.263	1.143		1.097
5% Offset Yield (N)= Displacement (mm)=	708.8	155.8	22.0	982.4	579.9	668.1	936.9	882.1	727.5	772.9	712.3	817.7	670.1	606.7	624.6	380.7		561.1
	1.107	0.272	24.5	0.996	0.975	1.087	0.874	0.892	0.922	0.993	0.765	0.899	1.123	1.267	1.664	1.438		1.605
Elastic Stiffness (N/mm)=	3621.65	3093.70	85.4	4502.02	1716.21	1595.09	4939.72	5044.91	3560.18	7562.77	5596.55	11662.02	1592.78	1026.20	679.67	522.14		702.86
Energy (N*m)=	10.90	1.91	17.6	12.89	9.73	10.51	14.65	12.58	11.56	12.42	11.40	12.02	8.31	9.34	10.62	7.28		9.36
Ductility Ratio=	49.24	39.38	80.0	56.74	27.02	23.95	54.06	63.43	49.06	101.34	78.02	154.24	31.12	17.37	10.29	11.17		11.57

Table A4.7a: S-PA Series Performance Parameters (US Customary Units)

Data Set: S-PA																			
Sample	Average	StDev	C.O.V.	S-PA-1	S-PA-2	S-PA-3	S-PA-4	S-PA-5	S-PA-6	S-PA-7	S-PA-8	S-PA-9	S-PA-10	S-PA-11	S-PA-12	S-PA-13	S-PA-14	S-PA-15	
Max Load (lbs)=	339.3	80.0	23.6	318.8	197.9	402.5	409.5	322.5	310.8	472.9	422.4	350.8	268.0	297.4	274.8	387.9	210.6	442.3	
	Displacement (in)=	0.389	0.022	5.7	0.366	0.367	0.419	0.424	0.400	0.347	0.384	0.415	0.405	0.370	0.376	0.377	0.403	0.374	0.406
Failure Load (lbs)=	268.3	63.4	23.6	251.0	156.2	323.2	323.7	257.8	247.7	376.5	329.7	277.0	212.5	234.5	219.0	297.4	165.5	352.6	
	Disp. @ Failure (in)=	0.427	0.019	4.5	0.403	0.396	0.425	0.456	0.429	0.405	0.413	0.454	0.432	0.431	0.422	0.411	0.460	0.425	0.442
40% Max (lbs)=	134.9	32.0	23.7	125.6	79.0	160.8	160.3	127.7	122.0	188.9	168.9	140.0	106.7	118.7	108.9	155.0	84.0	176.8	
	Displacement (in)=	0.090	0.019	20.8	0.083	0.096	0.111	0.121	0.083	0.064	0.117	0.110	0.105	0.076	0.073	0.067	0.091	0.063	0.096
Yield (lbs)=	273.7	62.9	23.0	256.4	158.3	322.0	327.6	258.0	260.1	378.4	337.9	280.7	222.9	250.6	219.9	310.3	168.5	353.9	
	Displacement (in)=	0.183	0.037	19.9	0.168	0.192	0.223	0.246	0.168	0.137	0.235	0.220	0.211	0.158	0.154	0.136	0.182	0.127	0.192
5% Offset Yield=	167.5	33.5	20.0	159.9	101.6	197.5	199.4	153.2	170.6	225.8	196.2	166.2	143.1	165.4	143.0	180.6	108.4	202.3	
	Displacement (in)=	0.140	0.019	13.7	0.133	0.151	0.164	0.178	0.130	0.118	0.166	0.155	0.150	0.127	0.129	0.121	0.132	0.109	0.138
Elastic Stiffness (lb/in)=	1504.41	247.69	16.5	1521.88	824.47	1443.59	1330.30	1531.09	1896.58	1610.11	1533.62	1331.61	1411.65	1628.33	1621.15	1709.47	1327.10	1845.22	
	Energy (lb*in)=	90.70	20.16	22.2	81.80	47.36	99.29	107.62	87.77	87.46	111.63	115.38	91.56	78.55	86.39	74.49	113.00	59.23	118.95
Ductility Ratio=	2.42	0.46	19.0	2.39	2.06	1.91	1.85	2.54	2.95	1.76	2.06	2.05	2.73	2.74	3.03	2.54	3.35	2.31	

Table A4.7b: S-PA Series Performance Parameters (Metric Units)

SPA																		
Sample	Average	StDev	C.O.V.	SPA-1	SPA-2	SPA-3	SPA-4	SPA-5	SPA-6	SPA-7	SPA-8	SPA-9	SPA-10	SPA-11	SPA-12	SPA-13	SPA-14	SPA-15
Max Load (N)=	1509.2	355.6	23.6	1418.2	880.1	1790.4	1821.7	1434.5	1382.5	2103.7	1878.9	1560.6	1192.0	1322.7	1222.6	1725.3	936.8	1967.5
Displacement (mm)=	9.877	0.565	5.7	9.296	9.312	10.645	10.780	10.155	8.816	9.746	10.531	10.292	9.401	9.550	9.576	10.244	9.492	10.323
Failure Load (N)=	1193.4	281.9	23.6	1116.5	694.8	1437.7	1439.9	1146.8	1101.9	1674.9	1466.7	1232.0	945.4	1043.0	974.4	1323.0	736.3	1568.3
Disp. @ Failure (mm)=	10.843	0.487	4.5	10.244	10.053	10.803	11.587	10.889	10.282	10.478	11.532	10.965	10.968	10.711	10.429	11.694	10.787	11.229
40% Max (N)=	600.0	142.2	23.7	558.5	351.3	715.3	713.1	568.0	542.5	840.1	751.1	622.5	474.7	526.0	484.6	689.7	373.7	786.3
Displacement (mm)=	2.296	0.479	20.8	2.096	2.433	2.830	3.061	2.118	1.633	2.979	2.797	2.670	1.920	1.852	1.707	2.304	1.608	2.433
Yield (N)=	1217.4	279.7	23.0	1140.3	704.1	1432.3	1457.4	1147.6	1157.0	1683.4	1503.1	1248.5	991.3	1114.6	978.1	1380.2	749.5	1574.0
Displacement (mm)=	4.655	0.928	19.9	4.279	4.876	5.666	6.256	4.280	3.484	5.970	5.597	5.354	4.010	3.909	3.445	4.610	3.225	4.871
5% Offset Yield (N)=	745.3	149.0	20.0	711.5	452.1	878.6	886.9	681.5	758.9	1004.5	872.8	739.1	636.8	735.6	635.9	803.3	482.2	899.7
Displacement (mm)=	3.555	0.486	13.7	3.376	3.828	4.161	4.529	3.312	2.985	4.211	3.940	3.807	3.218	3.279	3.071	3.348	2.769	3.495
Elastic Stiffness (N/mm)=	263.46	43.38	16.5	266.52	144.39	252.81	232.97	268.13	332.14	281.97	268.58	233.20	247.22	285.16	283.91	299.37	232.41	323.15
Energy (N*m)=	10.25	2.28	22.2	9.24	5.35	11.22	12.16	9.92	9.88	12.61	13.04	10.35	8.87	9.76	8.42	12.77	6.69	13.44
Ductility Ratio=	2.42	0.46	19.0	2.39	2.06	1.91	1.85	2.54	2.95	1.76	2.06	2.05	2.73	2.74	3.03	2.54	3.35	2.31

Table A4.8a: S-PAN Series Performance Parameters (US Customary Units)

Data Set: S-PAN																		
Sample	Average	StdDev	C.O.V.	SPAN-1	SPAN-2	SPAN-3	SPAN-4	SPAN-5	SPAN-6	SPAN-7	SPAN-8	SPAN-9	SPAN-10	Bad Test	SPAN-12	SPAN-13	SPAN-14	SPAN-15
Max Load (lbs)=	592.9	41.7	7.0	663.5	563.4	570.3	526.7	613.3	541.5	601.9	583.4	660.3	550.6		586.7	603.4	654.2	581.3
Displacement (in)=	0.359	0.011	3.0	0.379	0.357	0.346	0.363	0.378	0.351	0.359	0.362	0.361	0.355		0.370	0.340	0.360	0.351
Failure Load (lbs)=	467.4	34.7	7.4	521.1	444.6	450.6	412.0	489.1	425.6	472.2	463.4	521.4	430.4		461.7	481.2	522.1	448.7
Disp. @ Failure (in)=	0.399	0.012	3.1	0.395	0.384	0.422	0.413	0.410	0.384	0.401	0.410	0.399	0.401		0.407	0.379	0.382	0.397
40% Max (lbs)=	234.9	16.3	7.0	264.4	223.1	226.9	208.8	245.3	214.0	238.7	233.1	258.4	216.5		232.6	237.6	257.4	232.0
Displacement (in)=	0.062	0.010	16.1	0.084	0.067	0.055	0.049	0.079	0.052	0.058	0.072	0.057	0.062		0.063	0.051	0.061	0.059
Yield (lbs)=	476.4	32.2	6.8	530.8	470.2	456.2	421.4	490.7	433.2	482.4	468.7	528.3	447.4		469.3	482.7	523.4	465.0
Displacement (in)=	0.126	0.020	15.9	0.168	0.141	0.110	0.098	0.158	0.106	0.116	0.144	0.117	0.129		0.127	0.104	0.124	0.118
5% Offset Yield=	304.8	25.4	8.3	352.4	309.7	282.4	254.7	305.5	262.9	320.9	299.7	331.1	297.5		301.4	313.5	333.8	302.1
Displacement (in)=	0.108	0.014	13.0	0.138	0.118	0.096	0.085	0.125	0.090	0.104	0.122	0.101	0.115		0.111	0.097	0.106	0.104
Elastic Stiffness (lb/in)=	3857.68	499.57	13.0	3151.59	3324.60	4156.46	4297.03	3108.53	4099.94	4143.59	3247.14	4517.71	3469.98		3697.34	4640.93	4206.36	3946.30
Energy (lb*in)=	158.07	8.76	5.5	161.73	147.17	166.87	151.63	160.10	140.21	165.35	158.44	176.32	150.57		157.37	156.81	165.00	155.35
Ductility Ratio=	3.25	0.49	15.2	2.35	2.71	3.84	4.22	2.60	3.64	3.44	2.84	3.41	3.11		3.20	3.65	3.07	3.37

Table A4.8b: S-PAN Series Performance Parameters (Metric Units)

S-PAN		Average	StDev	C.O.V.	S-PAN-1	S-PAN-2	S-PAN-3	S-PAN-4	S-PAN-5	S-PAN-6	S-PAN-7	S-PAN-8	S-PAN-9	S-PAN-10	Bad Test	S-PAN-12	S-PAN-13	S-PAN-14	S-PAN-15
Sample																			
Max Load (N)=		2637.3	185.5	7.0	2951.4	2505.9	2536.7	2343.1	2728.2	2408.5	2677.4	2595.0	2937.3	2449.4		2609.6	2683.9	2910.0	2585.7
Displacement (mm)=		9.129	0.270	3.0	9.632	9.073	8.788	9.208	9.596	8.903	9.119	9.192	9.169	9.017		9.401	8.646	9.149	8.915
Failure Load (N)=		2079.2	154.3	7.4	2317.8	1977.7	2004.5	1832.8	2175.7	1893.0	2100.6	2061.1	2319.2	1914.7		2053.8	2140.5	2322.3	1995.7
Disp. @ Failure (mm)=		10.133	0.316	3.1	10.041	9.746	10.711	10.500	10.404	9.764	10.185	10.419	10.142	10.185		10.333	9.632	9.710	10.089
40% Max (N)=		1045.0	72.6	7.0	1176.2	992.3	1009.5	928.9	1091.0	952.0	1061.7	1037.1	1149.5	963.2		1034.5	1057.0	1145.1	1032.2
Displacement (mm)=		1.576	0.253	16.1	2.131	1.704	1.387	1.234	2.004	1.326	1.463	1.824	1.453	1.585		1.598	1.300	1.554	1.494
Yield (N)=		2119.1	143.4	6.8	2361.2	2091.7	2029.4	1874.4	2182.5	1926.8	2145.6	2084.9	2349.8	1990.2		2087.6	2147.1	2328.0	2068.5
Displacement (mm)=		3.195	0.507	15.9	4.278	3.593	2.788	2.491	4.009	2.684	2.957	3.666	2.970	3.275		3.224	2.642	3.160	2.993
5% Offset Yield (N)=		1356.0	113.0	8.3	1567.6	1377.5	1256.1	1133.0	1359.1	1169.2	1427.5	1333.3	1473.0	1323.4		1340.9	1394.6	1484.7	1343.6
Displacement (mm)=		2.742	0.356	13.0	3.508	3.005	2.449	2.149	3.167	2.286	2.639	3.104	2.565	2.911		2.812	2.466	2.695	2.639
Elastic Stiffness (N/mm)=		675.58	87.49	13.0	551.93	582.23	727.91	752.53	544.39	718.01	725.65	568.66	791.17	607.69		647.50	812.75	736.65	691.10
Energy (N*m)=		17.86	0.99	5.5	18.27	16.63	18.85	17.13	18.09	15.84	18.68	17.90	19.92	17.01		17.78	17.72	18.64	17.55
Ductility Ratio=		3.25	0.49	15.2	2.35	2.71	3.84	4.22	2.60	3.64	3.44	2.84	3.41	3.11		3.20	3.65	3.07	3.37

Table A4.9a: S-PN Series Performance Parameters (US Customary Units)

Data Set: S-PN																		
Sample	Average	StDev	C.O.V.	SPN-1	SPN-2	SPN-3	SPN-4	SPN-5	SPN-6	SPN-7	SPN-8	SPN-9	SPN-10	SPN-11	SPN-12	SPN-13	SPN-14	SPN-15
Max Load (lbs)= Displacement (in)=	163.0	18.9	11.6	140.1	131.3	161.9	164.6	166.6	189.5	147.8	195.5	166.9	147.2	167.2	136.5	190.2	168.2	171.0
	0.248	0.069	27.7	0.112	0.275	0.310	0.300	0.213	0.222	0.102	0.342	0.270	0.196	0.318	0.244	0.251	0.255	0.318
Failure Load (lbs)= Disp. @ Failure (in)=	147.4	18.8	12.8	122.9	119.2	150.5	146.4	150.3	171.6	123.3	180.1	147.1	142.6	139.8	132.1	182.8	146.0	156.9
	0.499	0.004	0.8	0.501	0.498	0.498	0.495	0.498	0.502	0.497	0.497	0.506	0.498	0.506	0.497	0.504	0.492	0.502
40% Max (lbs)= Displacement (in)=	60.5	7.9	13.1	52.2	52.2	56.8	63.3	61.0	66.8	57.5	76.3	66.5	55.1	56.9	43.9	69.4	67.1	62.9
	0.011	0.007	66.4	0.005	0.017	0.014	0.003	0.004	0.007	0.016	0.018	0.028	0.003	0.011	0.003	0.009	0.008	0.014
Yield (lbs)= Displacement (in)=	149.4	18.2	12.2	126.2	121.4	151.0	149.8	152.2	171.6	130.1	182.3	142.8	137.4	154.8	127.8	179.4	157.3	157.2
	0.025	0.016	61.1	0.012	0.040	0.036	0.006	0.009	0.019	0.037	0.043	0.060	0.008	0.030	0.008	0.023	0.018	0.035
5% Offset Yield= Displacement (in)=	121.2	16.5	13.6	103.4	92.8	122.9	110.2	107.0	124.0	119.6	140.3	107.4	111.7	146.8	117.3	150.4	142.3	121.5
	0.049	0.012	24.9	0.041	0.064	0.055	0.032	0.036	0.039	0.059	0.062	0.072	0.032	0.054	0.037	0.046	0.045	0.056
Elastic Stiffness (lb/in)=	9363	6633	70.8	10875.64	3016.70	4205.29	25314.18	17421.58	9025.90	3507.37	4261.33	2391.53	17206.97	5083.86	16882.48	7794.57	8941.97	4523.10
Energy (lb*in)=	72.71	8.90	12.2	62.46	58.00	72.48	73.63	75.06	84.52	62.27	86.70	67.93	67.88	75.99	63.07	88.32	76.06	76.22
Ductility Ratio=	31.92	23.36	73.2	43.14	12.38	13.87	83.56	56.94	26.39	13.41	11.62	8.46	62.36	16.63	65.66	21.90	28.00	14.46

Table A4.9b: S-PN Series Performance Parameters (Metric Units)

S-PN																		
Sample	Average	StDev	C.O.V.	SPN-1	SPN-2	SPN-3	SPN-4	SPN-5	SPN-6	SPN-7	SPN-8	SPN-9	SPN-10	SPN-11	SPN-12	SPN-13	SPN-14	SPN-15
Max Load (N)= Displacement (mm)=	724.9	84.0	11.6	623.3	584.0	720.2	732.0	741.0	842.8	657.6	869.7	742.4	654.8	743.7	607.1	846.2	748.1	760.6
	6.312	1.749	27.7	2.835	6.988	7.884	7.610	5.398	5.649	2.583	8.692	6.868	4.986	8.075	6.187	6.370	6.474	8.077
Failure Load (N)= Disp. @ Failure (mm)=	655.9	83.7	12.8	546.8	530.2	669.5	651.0	668.5	763.5	548.4	801.1	654.2	634.4	622.0	587.7	813.3	649.5	697.8
	12.684	0.097	0.8	12.718	12.649	12.649	12.560	12.637	12.748	12.631	12.624	12.840	12.649	12.857	12.629	12.799	12.507	12.758
40% Max (N)= Displacement (mm)=	269.2	35.2	13.1	232.2	232.1	252.5	281.5	271.2	297.1	255.9	339.3	295.7	244.9	253.3	195.3	308.6	298.3	279.7
	0.268	0.178	66.4	0.122	0.439	0.343	0.064	0.089	0.188	0.417	0.455	0.706	0.081	0.284	0.066	0.226	0.191	0.353
Yield (N)= Displacement (mm)=	664.6	81.1	12.2	561.4	539.9	671.6	666.4	677.1	763.5	578.6	810.9	635.3	611.2	688.5	568.6	797.9	699.6	699.1
	0.647	0.395	61.1	0.295	1.022	0.912	0.150	0.222	0.483	0.942	1.087	1.517	0.203	0.773	0.192	0.584	0.447	0.883
5% Offset Yield (N)= Displacement (mm)=	539.1	73.3	13.6	460.0	412.7	546.8	490.3	476.1	551.8	532.1	624.1	477.9	497.1	653.2	521.8	669.1	633.2	540.6
	1.233	0.307	24.9	1.039	1.613	1.387	0.818	0.904	0.998	1.509	1.572	1.816	0.810	1.372	0.927	1.176	1.138	1.420
Elastic Stiffness (N/mm)=	1639.80	1161.68	70.8	1904.62	528.31	736.46	4433.19	3050.99	1580.68	614.23	746.27	418.82	3013.40	890.32	2956.58	1365.04	1565.98	792.12
Energy (N*m)=	8.21	1.01	12.2	7.06	6.55	8.19	8.32	8.48	9.55	7.04	9.80	7.68	7.67	8.59	7.13	9.98	8.59	8.61
Ductility Ratio=	31.92	23.36	73.2	43.14	12.38	13.87	83.56	56.94	26.39	13.41	11.62	8.46	62.36	16.63	65.66	21.90	28.00	14.46

Table A4.10a: S-PMT1 Series Performance Parameters (US Customary Units)

Data Set: S-PMT1 (3M VHB 4941)																		
Sample	Average	StDev	C.O.V.	S-PMT1-1	S-PMT1-2	S-PMT1-3	S-PMT1-4	S-PMT1-5	S-PMT1-6	S-PMT1-7	S-PMT1-8	S-PMT1-9	S-PMT1-10	S-PMT1-11	S-PMT1-12	S-PMT1-13	S-PMT1-14	S-PMT1-15
Max Load (lbs)=	293.2	78.8	26.9	352.8	265.9	426.4	437.1	232.8	351.5	294.8	236.4	237.8	238.3	209.9	356.6	223.7	175.7	359.0
	0.333	0.022	6.6	0.362	0.333	0.361	0.374	0.335	0.331	0.338	0.296	0.301	0.314	0.305	0.346	0.323	0.332	0.338
Failure Load (lbs)=	230.1	61.4	26.7	275.0	210.3	336.9	342.5	184.0	275.6	230.6	183.3	189.6	183.5	165.9	278.8	176.7	139.5	279.0
	0.369	0.023	6.2	0.396	0.364	0.408	0.407	0.365	0.389	0.374	0.348	0.357	0.340	0.330	0.360	0.347	0.372	0.372
40% Max (lbs)=	115.7	31.6	27.3	137.2	105.4	169.1	174.0	92.9	139.2	116.5	92.8	93.4	95.2	79.5	141.4	88.8	68.3	142.3
	0.065	0.018	27.1	0.072	0.067	0.086	0.111	0.056	0.057	0.058	0.057	0.066	0.052	0.038	0.057	0.063	0.046	0.086
Yield (lbs)=	240.4	63.5	26.4	284.0	219.9	341.1	349.7	186.2	298.2	247.8	207.7	196.0	195.0	168.0	285.3	182.6	140.6	304.6
	0.135	0.035	26.2	0.148	0.140	0.174	0.223	0.112	0.123	0.123	0.128	0.138	0.106	0.080	0.115	0.129	0.094	0.184
5% Offset Yield=	153.7	40.2	26.2	177.5	142.3	212.3	215.9	114.8	198.1	160.3	149.8	123.5	116.1	104.4	178.9	118.1	92.3	201.2
	0.113	0.022	19.9	0.120	0.116	0.136	0.165	0.098	0.111	0.105	0.118	0.112	0.090	0.077	0.098	0.109	0.087	0.148
Elastic Stiffness (lb/in)=	1808.17	325.54	18.0	1913.71	1572.81	1956.92	1568.70	1655.51	2433.01	2009.39	1621.78	1419.67	1840.71	2087.78	2477.14	1415.88	1490.83	1658.64
Energy (lb*in)=	72.35	20.68	28.6	91.42	64.70	109.93	102.80	56.65	97.76	77.34	59.05	56.43	55.93	47.03	84.54	51.62	45.56	85.43
Ductility Ratio=	2.89	0.60	20.8	2.67	2.60	2.34	1.83	3.25	3.17	3.03	2.72	2.58	3.21	4.10	3.12	2.69	3.94	2.03

Table A4.10b: S-PMT1 Series Performance Parameters (Metric Units)

S-PMT1 (3M VHB 4941)																		
Sample	Average	SDev	C.O.V.	S-PMT1-1	S-PMT1-2	S-PMT1-3	S-PMT1-4	S-PMT1-5	S-PMT1-6	S-PMT1-7	S-PMT1-8	S-PMT1-9	S-PMT1-10	S-PMT1-11	S-PMT1-12	S-PMT1-13	S-PMT1-14	S-PMT1-15
Max Load (N)=	1304.4	350.3	26.9	1569.3	1183.0	1896.6	1944.4	1035.4	1563.6	1311.5	1051.4	1057.6	1059.9	933.9	1586.4	995.0	781.8	1596.9
	8.447	0.556	6.6	9.195	8.446	9.174	9.502	8.496	8.402	8.590	7.518	7.645	7.986	7.737	8.786	8.204	8.435	8.590
Failure Load (N)=	1023.5	273.3	26.7	1223.4	935.4	1498.7	1523.5	818.4	1226.0	1026.0	815.6	843.4	816.1	738.0	1240.3	786.2	620.3	1241.2
	9.362	0.576	6.2	10.061	9.248	10.368	10.338	9.274	9.883	9.495	8.849	9.065	8.631	8.377	9.131	8.819	9.441	9.456
40% Max (N)=	514.8	140.6	27.3	610.4	488.7	752.1	773.9	413.1	619.1	518.4	412.6	415.5	423.3	353.8	629.2	394.9	303.7	633.0
	1.645	0.446	27.1	1.821	1.702	2.195	2.817	1.425	1.453	1.473	1.453	1.671	1.313	0.968	1.450	1.593	1.163	2.179
Yield (N)=	1069.5	282.6	26.4	1263.4	978.3	1517.3	1555.5	828.3	1326.6	1102.2	923.7	872.1	867.3	747.1	1269.1	812.1	625.4	1354.8
	3.418	0.894	26.2	3.770	3.552	4.427	5.662	2.857	3.113	3.132	3.252	3.508	2.690	2.043	2.925	3.275	2.395	4.664
5% Offset Yield (N)=	683.7	178.8	26.2	789.6	632.9	944.5	960.4	510.5	881.4	712.9	666.4	549.3	516.6	464.3	795.8	525.4	410.4	895.0
	2.863	0.571	19.9	3.048	2.951	3.465	4.186	2.489	2.814	2.667	3.000	2.847	2.291	1.956	2.494	2.756	2.212	3.764
Elastic Stiffness (N/mm)=	316.66	57.01	18.0	335.14	275.44	342.71	274.72	289.92	426.09	351.90	284.02	248.62	322.36	365.63	433.81	247.96	261.08	290.47
Energy (N*m)=	8.17	2.34	28.6	10.33	7.31	12.31	11.62	6.40	11.05	8.74	6.67	6.38	6.32	5.31	9.55	5.83	5.15	9.65
Ductility Ratio=	2.89	0.60	20.8	2.67	2.60	2.34	1.83	3.25	3.17	3.03	2.72	2.58	3.21	4.10	3.12	2.69	3.94	2.03

Table A4.11a: S-PMT2 Series Performance Parameters (US Customary Units)

Data Set: S-PMT2 (Adco Blue)																		
Sample	Average	StDev	C.O.V.	S-PMT2-1	S-PMT2-2	S-PMT2-3	S-PMT2-4	S-PMT2-5	S-PMT2-6	S-PMT2-7	S-PMT2-8	S-PMT2-9	S-PMT2-10	S-PMT2-11	S-PMT2-12	S-PMT2-13	S-PMT2-14	S-PMT2-15
Max Load (lbs)=	251.3	71.3	28.4	223.1	240.5	235.3	163.5	175.0	214.5	262.8	291.1	288.8	269.3	334.0	138.2	179.0	378.6	376.3
	0.291	0.017	6.0	0.283	0.292	0.296	0.260	0.300	0.294	0.276	0.310	0.316	0.289	0.274	0.273	0.273	0.311	0.321
Failure Load (lbs)=	195.2	54.3	27.8	174.6	188.1	173.6	129.3	139.7	171.3	202.8	227.3	223.8	215.1	258.8	105.6	139.1	290.7	287.9
	0.318	0.017	5.3	0.321	0.332	0.308	0.290	0.313	0.322	0.315	0.335	0.345	0.323	0.322	0.289	0.291	0.328	0.339
40% Max (lbs)=	99.3	28.7	28.9	88.3	95.4	92.9	64.6	69.7	83.9	103.2	115.9	114.4	106.6	131.6	53.3	69.4	150.8	150.0
	0.100	0.026	25.9	0.087	0.112	0.063	0.070	0.089	0.113	0.075	0.106	0.077	0.123	0.123	0.087	0.089	0.134	0.160
Yield (lbs)=	225.9	71.9	31.9	191.8	227.0	188.2	131.9	149.7	214.5	219.9	262.4	234.1	269.3	334.0	118.2	159.2	369.7	318.4
	0.224	0.062	27.8	0.188	0.267	0.127	0.143	0.192	0.288	0.160	0.239	0.157	0.289	0.274	0.193	0.204	0.311	0.321
5% Offset Yield=	178.8	80.0	44.7	116.5	233.1	106.9	89.9	96.9	204.4	136.3	157.6	152.5	248.9	308.0	80.7	138.7	323.8	287.9
	0.213	0.088	41.2	0.142	0.302	0.097	0.124	0.151	0.305	0.124	0.169	0.128	0.315	0.314	0.160	0.203	0.327	0.339
Elastic Stiffness (lb/in)=	1010.60	258.55	25.6	1019.29	849.64	1479.56	919.50	780.87	744.76	1375.58	1096.83	1492.13	867.23	1069.35	613.92	781.93	1128.51	939.94
	45.85	12.85	28.0	43.50	45.04	43.99	28.82	32.49	38.98	51.58	56.44	62.39	47.59	56.70	22.80	30.13	64.10	63.19
Ductility Ratio=	1.54	0.43	27.8	1.71	1.24	2.42	2.02	1.63	1.12	1.97	1.40	2.20	1.12	1.18	1.50	1.43	1.05	1.05

Table A4.11b S-PMT2 Series Performance Parameters (Metric Units)

S-PMT2 (Adco Blue)																		
Sample	Average	StDev	C.O.V.	S-PMT2-1	S-PMT2-2	S-PMT2-3	S-PMT2-4	S-PMT2-5	S-PMT2-6	S-PMT2-7	S-PMT2-8	S-PMT2-9	S-PMT2-10	S-PMT2-11	S-PMT2-12	S-PMT2-13	S-PMT2-14	S-PMT2-15
Max Load (N)= Displacement (mm)=	1118.0	317.0	28.4	992.3	1069.9	1046.5	727.3	778.6	954.3	1169.2	1294.7	1284.6	1197.9	1485.8	614.9	796.3	1684.1	1673.7
	7.397	0.444	6.0	7.193	7.422	7.513	6.609	7.610	7.457	7.021	7.874	8.037	7.341	6.949	6.932	6.944	7.904	8.156
Failure Load (N)= Disp. @ Failure (mm)=	868.2	241.3	27.8	776.7	836.8	772.2	575.2	621.5	762.1	902.2	1011.0	995.4	956.9	1151.0	469.7	618.9	1293.0	1280.6
	8.080	0.428	5.3	8.151	8.433	7.821	7.371	7.948	8.186	7.988	8.501	8.760	8.212	8.166	7.346	7.394	8.321	8.603
40% Max (N)= Displacement (mm)=	441.9	127.6	28.9	392.6	424.4	413.3	287.5	310.2	373.0	458.9	515.7	509.1	474.1	585.6	237.3	308.5	670.7	667.3
	2.550	0.659	25.9	2.200	2.852	1.595	1.766	2.268	2.860	1.905	2.685	1.948	3.122	3.127	2.207	2.253	3.393	4.054
Yield (N)= Displacement (mm)=	1004.8	320.0	31.9	853.1	1009.5	837.2	586.9	665.7	954.3	978.2	1167.3	1041.5	1197.9	1485.8	525.8	708.0	1644.5	1416.1
	5.677	1.581	27.8	4.779	6.785	3.231	3.645	4.868	7.317	4.061	6.077	3.986	7.341	6.949	4.890	5.170	7.904	8.156
5% Offset Yield (N)= Displacement (mm)=	795.3	355.9	44.7	518.1	1036.8	475.4	399.7	431.2	909.2	606.2	701.0	678.2	1107.2	1370.2	358.9	617.0	1440.3	1280.6
	5.417	2.232	41.2	3.594	7.666	2.474	3.160	3.840	7.755	3.157	4.285	3.256	8.006	7.968	4.059	5.144	8.296	8.603
Elastic Stiffness (N/mm)=	176.98	45.28	25.6	178.51	148.79	259.11	161.03	136.75	130.43	240.90	192.09	261.31	151.88	187.27	107.51	136.94	197.63	164.61
Energy (N*m)=	5.18	1.45	28.0	4.92	5.09	4.97	3.26	3.67	4.40	5.83	6.38	7.05	5.38	6.41	2.58	3.40	7.24	7.14
Ductility Ratio=	1.54	0.43	27.8	1.71	1.24	2.42	2.02	1.63	1.12	1.97	1.40	2.20	1.12	1.18	1.50	1.43	1.05	1.05

Table A4.12a: S-PMT3 Series Performance Parameters (US Customary Units)

Data Set: S-PMT3 (Avery 2333)																		
Sample	Average	StDev	C.O.V.	S-PMT3-1	S-PMT3-2	S-PMT3-3	S-PMT3-4	S-PMT3-5	S-PMT3-6	S-PMT3-7	S-PMT3-8	S-PMT3-9	S-PMT3-10	S-PMT3-11	S-PMT3-12	S-PMT3-13	S-PMT3-14	S-PMT3-15
Max Load (lbs)= Displacement (in)=	237.1	22.7	9.6	207.3	292.8	238.3	241.5	261.0	214.2	232.1	252.7	231.4	212.4	240.5	255.8	249.7	207.0	219.3
	0.106	0.015	14.1	0.077	0.122	0.104	0.093	0.104	0.143	0.122	0.116	0.097	0.104	0.100	0.104	0.105	0.101	0.093
Failure Load (lbs)= Disp. @ Failure (in)=	181.2	17.0	9.4	163.0	213.9	185.2	181.9	203.3	162.0	175.8	192.7	178.6	166.6	184.9	202.8	191.2	154.1	161.9
	0.127	0.013	10.3	0.092	0.133	0.130	0.119	0.126	0.156	0.136	0.132	0.124	0.128	0.139	0.126	0.124	0.128	0.115
40% Max (lbs)= Displacement (in)=	91.1	8.9	9.8	77.7	110.4	93.1	93.5	100.8	84.2	89.1	97.5	91.3	81.7	92.0	94.9	99.9	77.7	82.1
	0.035	0.007	21.1	0.025	0.035	0.044	0.034	0.033	0.055	0.041	0.028	0.031	0.034	0.028	0.035	0.039	0.033	0.031
Yield (lbs)= Displacement (in)=	224.5	22.9	10.2	203.2	256.2	238.3	241.5	246.3	214.2	228.4	207.0	219.8	192.4	212.2	249.6	260.2	181.3	216.4
	0.086	0.020	23.3	0.064	0.081	0.104	0.088	0.080	0.141	0.105	0.059	0.075	0.079	0.064	0.092	0.101	0.076	0.081
5% Offset Yield= Displacement (in)=	225.9	24.7	11.0	203.9	292.8	205.1	234.4	255.5	189.5	214.1	228.5	227.9	210.6	230.3	246.5	232.4	204.2	212.1
	0.115	0.015	13.4	0.091	0.122	0.124	0.112	0.112	0.153	0.125	0.091	0.107	0.120	0.095	0.124	0.122	0.114	0.107
Elastic Stiffness (lb/in)=	2701.18	510.92	18.9	3170.12	3173.73	2101.36	2734.74	3091.70	1523.10	2184.42	3521.31	2927.30	2423.03	3320.65	2712.83	2566.97	2383.78	2682.74
Energy (lb*in)=	19.03	2.73	14.3	12.18	23.63	19.17	19.58	21.15	19.21	19.08	21.33	19.00	17.06	22.67	19.84	19.03	16.33	16.16
Ductility Ratio=	1.54	0.31	20.5	1.44	1.64	1.24	1.35	1.58	1.11	1.30	2.25	1.65	1.62	2.17	1.36	1.22	1.68	1.43

Table A4.12b S-PMT3 Series Performance Parameters (Metric Units)

S-PMT3 (Avery 2333)																		
Sample	Average	StDev	C.O.V.	S-PMT3-1	S-PMT3-2	S-PMT3-3	S-PMT3-4	S-PMT3-5	S-PMT3-6	S-PMT3-7	S-PMT3-8	S-PMT3-9	S-PMT3-10	S-PMT3-11	S-PMT3-12	S-PMT3-13	S-PMT3-14	S-PMT3-15
Max Load (N)= Displacement (mm)=	1054.6	101.2	9.6	922.2	1302.5	1060.1	1074.4	1161.1	952.8	1032.4	1124.2	1029.4	944.9	1070.0	1137.7	1110.8	921.0	975.7
	2.684	0.379	14.1	1.953	3.099	2.647	2.367	2.644	3.642	3.091	2.946	2.456	2.642	2.532	2.652	2.654	2.565	2.372
Failure Load (N)= Disp. @ Failure (mm)=	806.0	75.6	9.4	725.3	951.4	823.9	809.0	904.2	720.7	782.0	857.2	794.3	741.1	822.5	901.9	850.3	685.4	720.3
	3.229	0.333	10.3	2.337	3.368	3.292	3.028	3.193	3.962	3.449	3.363	3.150	3.261	3.526	3.188	3.145	3.254	2.921
40% Max (N)= Displacement (mm)=	405.1	39.7	9.8	345.5	491.3	414.1	416.0	448.3	374.7	396.4	433.9	406.3	363.2	409.2	422.4	444.2	345.7	365.2
	0.887	0.187	21.1	0.622	0.884	1.125	0.869	0.828	1.405	1.036	0.704	0.792	0.856	0.704	0.889	0.988	0.828	0.777
Yield (N)= Displacement (mm)=	998.5	102.0	10.2	903.7	1139.6	1060.1	1074.4	1095.5	952.8	1016.0	920.9	977.6	855.8	943.7	1110.2	1157.5	806.7	962.5
	2.183	0.508	23.3	1.628	2.050	2.647	2.243	2.023	3.572	2.656	1.493	1.907	2.017	1.623	2.337	2.575	1.932	2.049
5% Offset Yield (N)= Displacement (mm)=	1004.6	110.1	11.0	907.1	1302.5	912.5	1042.5	1136.3	843.1	952.3	1016.4	1013.6	936.9	1024.4	1096.3	1034.0	908.5	943.3
	2.911	0.390	13.4	2.304	3.099	3.155	2.840	2.847	3.889	3.178	2.319	2.725	3.043	2.408	3.145	3.106	2.883	2.718
Elastic Stiffness (N/mm)=	473.05	89.48	18.9	555.17	555.81	368.00	478.93	541.44	266.73	382.55	616.68	512.65	424.34	581.53	475.09	449.54	417.46	469.82
Energy (N*m)=	2.15	0.31	14.3	1.38	2.67	2.17	2.21	2.39	2.17	2.16	2.41	2.15	1.93	2.56	2.24	2.15	1.85	1.83
Ductility Ratio=	1.54	0.31	20.5	1.44	1.64	1.24	1.35	1.58	1.11	1.30	2.25	1.65	1.62	2.17	1.36	1.22	1.68	1.43

Table A4.13a: Wood Glue Series Performance Parameters (US Customary Units)

Data Set: WG								
Sample	Average	StDev	C.O.V.	WG-O1	WG-O2	WG-P1	WG-P2	WG-P3
Max Load (lbs)=	2613.5	543.6	20.8	1990.4	2188.2	2369.7	3341.9	3177.5
Displacement (in)=	0.097	0.034	34.9	0.052	0.073	0.096	0.149	0.118
Failure Load (lbs)=	1303.1	818.6	62.8	1050.1	1396.1	19.2	2567.0	1483.4
Disp. @ Failure (in)=	0.104	0.031	29.8	0.069	0.074	0.100	0.148	0.129
40% Max (lbs)=	1017.3	210.3	20.7	788.5	836.6	925.4	1299.1	1237.1
Displacement (in)=	0.022	0.007	31.1	0.012	0.028	0.019	0.030	0.020
Yield (lbs)=	2206.3	545.4	24.7	1592.5	1817.2	1895.8	2845.5	2880.4
Displacement (in)=	0.046	0.015	32.1	0.024	0.057	0.039	0.067	0.046
5% Offset Yield=	2157.3	564.0	26.1	1773.8	1396.1	2025.9	2669.2	2921.7
Displacement (in)=	0.072	0.011	15.5	0.054	0.074	0.067	0.088	0.075
5% Offset Yield is not a meaningful value for this subset (Brittle Failure)								
Elastic Stiffness (lb/in)=	50299	13598	27.0	67389.88	29667.76	49222.59	42733.89	62480.07
Energy (lb*in)=	189.40	106.03	56.0	90.27	81.45	142.29	326.68	306.33
Ductility Ratio=	2.36	0.59	24.9	2.90	1.28	2.59	2.22	2.81

Table A4.13b Wood Glue Series Performance Parameters (Metric Units)

WG								
Sample	Average	StDev	C.O.V.	WG-O1	WG-O2	WG-P1	WG-P2	WG-P3
Max Load (N)=	11625.6	2417.8	20.8	8853.8	9733.5	10540.9	14865.6	14134.2
Displacement (mm)=	2.473	0.862	34.9	1.313	1.849	2.426	3.777	3.002
Failure Load (N)=	5796.7	3641.5	62.8	4671.2	6210.1	85.4	11418.4	6598.3
Disp. @ Failure (mm)=	2.637	0.787	29.8	1.740	1.867	2.530	3.762	3.287
40% Max (N)=	4525.3	935.6	20.7	3507.3	3721.5	4116.3	5778.7	5502.9
Displacement (mm)=	0.553	0.172	31.1	0.297	0.716	0.478	0.772	0.503
Yield (N)=	9814.0	2426.2	24.7	7083.9	8083.3	8432.7	12657.3	12812.6
Displacement (mm)=	1.180	0.378	32.1	0.600	1.457	0.978	1.691	1.171
5% Offset Yield (N)=	9596.3	2508.6	26.1	7890.2	6210.1	9011.5	11873.4	12996.6
Displacement (mm)=	1.818	0.282	15.5	1.377	1.867	1.697	2.240	1.910
5% Offset Yield is not a meaningful value for this subset (Brittle Failure)								
Elastic Stiffness (N/mm)=	8809	2381	27.0	11801.78	5195.62	8620.20	7483.85	10941.94
Energy (N*m)=	21.40	11.98	56.0	10.20	9.20	16.08	36.91	34.61
Ductility Ratio=	2.36	0.59	24.9	2.90	1.28	2.59	2.22	2.81

Table A4.14a: Liquid Nail Series Performance Parameters (US Customary Units)

Data Set: LN								
Sample	Average	StDev	C.O.V.	LN-O1	LN-O2	LN-P1	LN-P2	LN-P3
Max Load (lbs)=	1854.5	303.6	16.4	1450.0	1545.2	2035.0	2236.9	2005.6
Displacement (in)=	0.074	0.019	25.4	0.045	0.067	0.095	0.094	0.068
Failure Load (lbs)=	820.9	564.4	68.7	-86.9	1218.3	1183.7	44.4	924.0
Disp. @ Failure (in)=	0.082	0.021	25.3	0.052	0.086	0.093	0.111	0.066
40% Max (lbs)=	719.5	127.4	17.7	558.1	574.5	812.1	863.0	790.0
Displacement (in)=	0.017	0.002	14.1	0.014	0.015	0.019	0.018	0.020
Yield (lbs)=	1662.9	257.3	15.5	1284.5	1470.7	1686.8	1915.9	1956.5
Displacement (in)=	0.040	0.006	15.3	0.031	0.039	0.039	0.039	0.050
5% Offset Yield=	1671.0	733.2	43.9	-86.9	1502.1	1494.6	1924.4	1849.6
Displacement (in)=	0.064	0.007	11.3	0.052	0.069	0.060	0.067	0.073
5% Offset Yield is not a meaningful value for this subset (Brittle Failure)								
Elastic Stiffness (lb/in)=	42141	3947	9.4	41342.65	37794.44	43425.37	49034.26	39110.13
Energy (lb*in)=	104.76	43.23	41.3	47.10	97.42	124.62	175.05	79.61
Ductility Ratio=	2.09	0.54	25.7	1.68	2.20	2.40	2.84	1.31

Table A4.14b Liquid Nail Series Performance Parameters (Metric Units)

LN								
Sample	Average	StDev	C.O.V.	LN-O1	LN-O2	LN-P1	LN-P2	LN-P3
Max Load (N)=	8249.4	1350.6	16.4	6449.8	6873.5	9052.1	9950.4	8921.2
Displacement (mm)=	1.874	0.475	25.4	1.148	1.699	2.405	2.390	1.725
Failure Load (N)=	3651.4	2510.4	68.7	-386.7	5419.4	5265.4	197.7	4110.0
Disp. @ Failure (mm)=	2.072	0.524	25.3	1.326	2.177	2.370	2.817	1.669
40% Max (N)=	3200.7	566.9	17.7	2482.7	2555.4	3612.2	3838.8	3514.2
Displacement (mm)=	0.433	0.061	14.1	0.343	0.386	0.475	0.447	0.513
Yield (N)=	7396.9	1144.4	15.5	5713.7	6541.9	7503.1	8522.5	8703.1
Displacement (mm)=	1.005	0.154	15.3	0.789	0.988	0.987	0.992	1.271
5% Offset Yield (N)=	7432.8	3261.2	43.9	-386.7	6681.6	6648.4	8560.1	8227.6
Displacement (mm)=	1.628	0.183	11.3	1.326	1.742	1.521	1.704	1.844
5% Offset Yield is not a meaningful value for this subset (Brittle Failure)								
Elastic Stiffness (N/mm)=	7380	691	9.4	7240.21	6618.82	7604.95	8587.21	6849.23
Energy (N*m)=	11.84	4.88	41.3	5.32	11.01	14.08	19.78	8.99
Ductility Ratio=	2.09	0.54	25.7	1.68	2.20	2.40	2.84	1.31

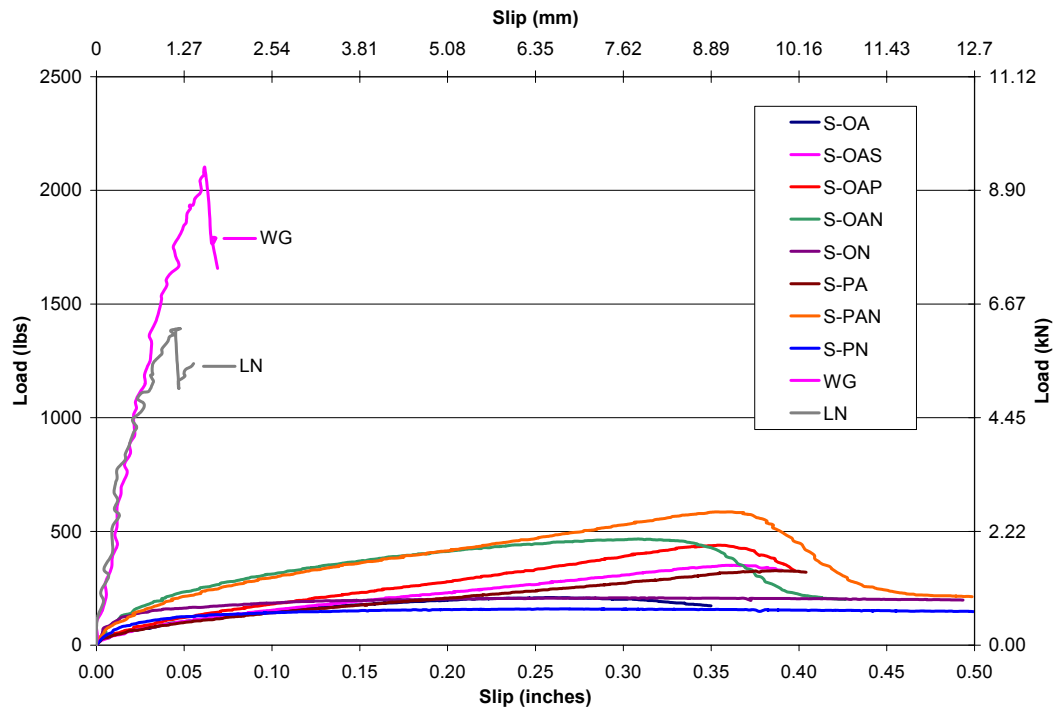


Figure A4.1: Average Load-Displacement Curves (Including Traditional Adhesives)

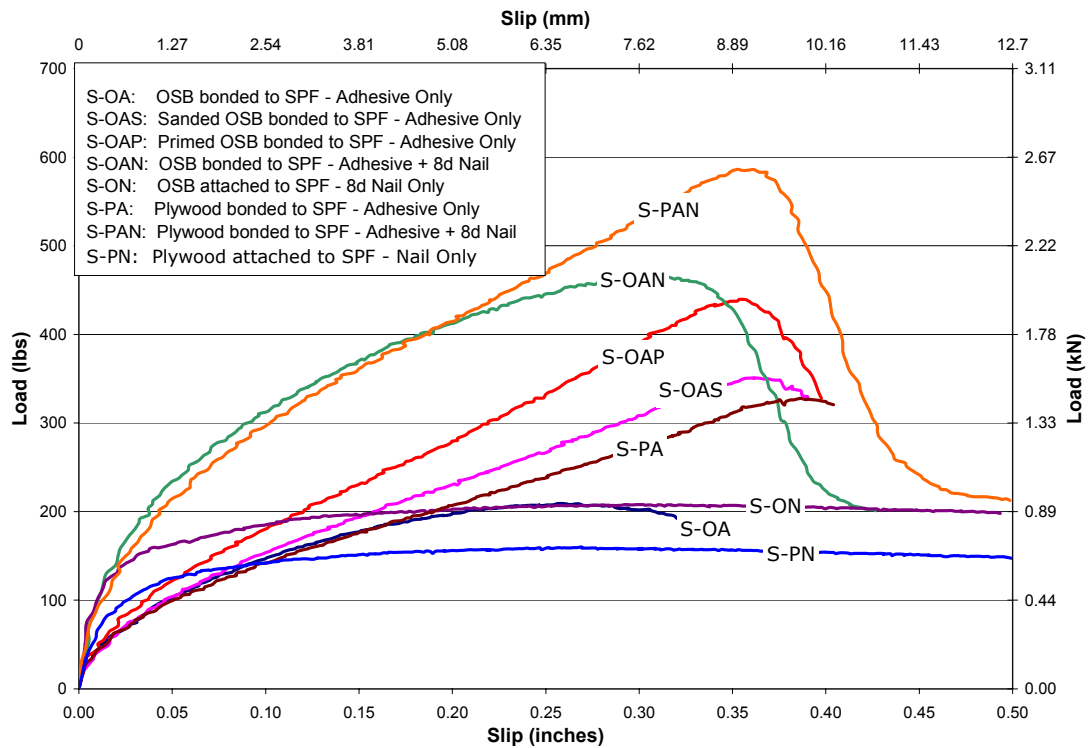


Figure A4.2: Average Load-Displacement Curves (Excluding Traditional Adhesives)

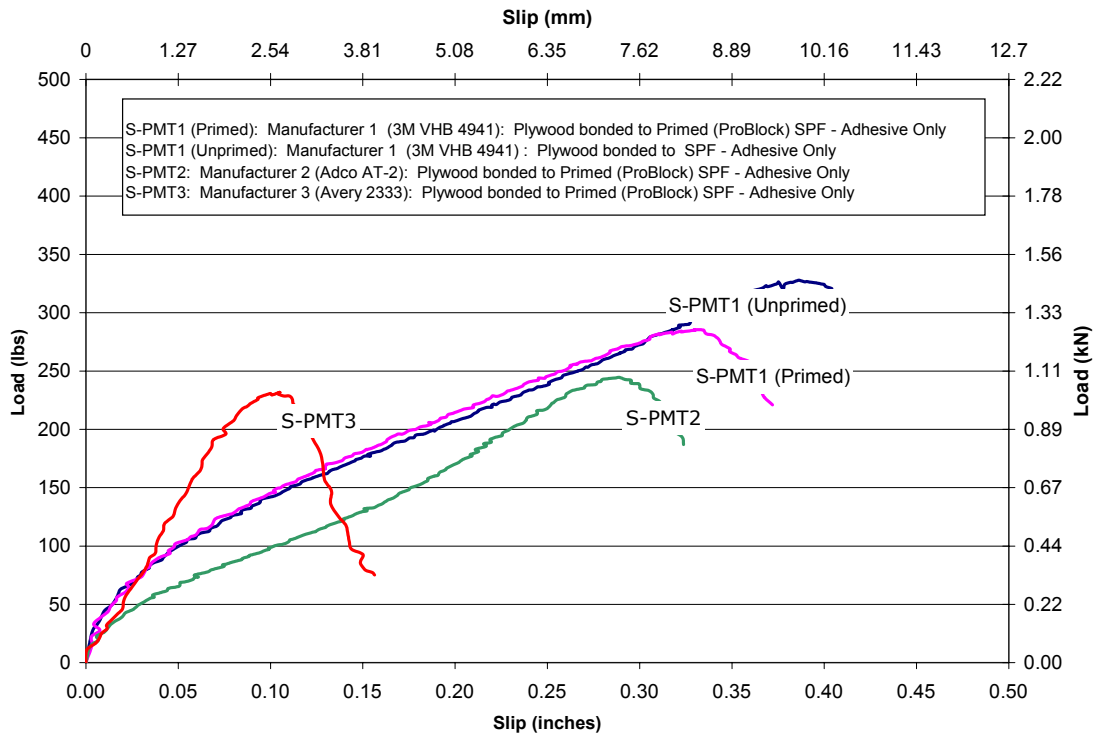


Figure A4.3: Alternate Tape Manufacturer Average Load-Displacement Curves

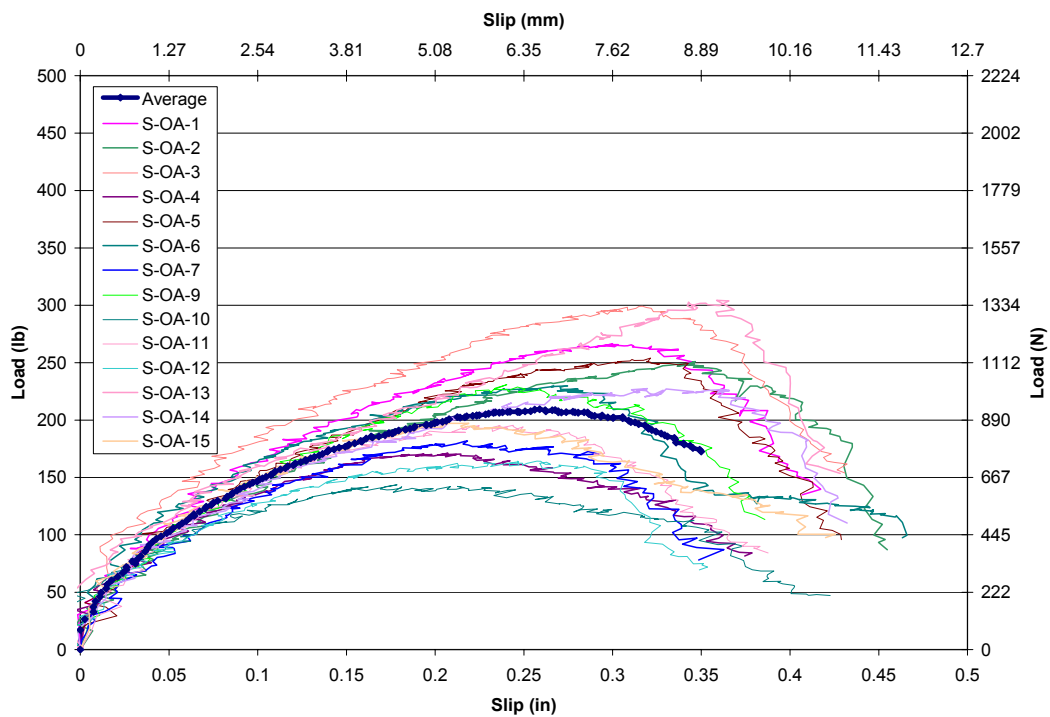


Figure A4.4: S-OA Load-Displacement Curves

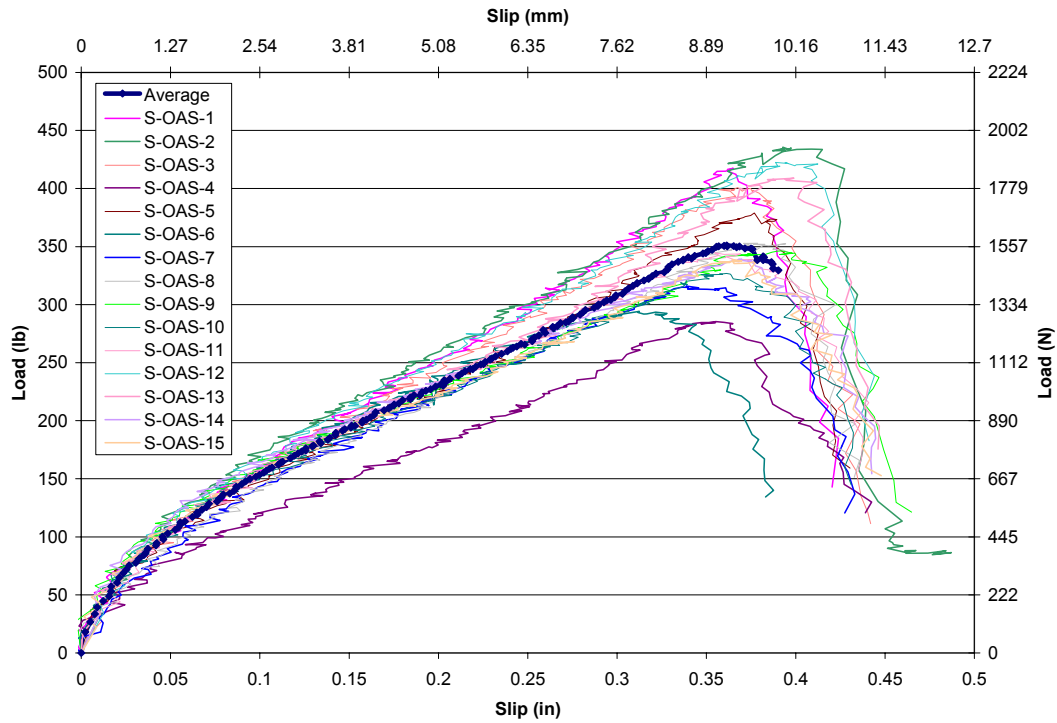


Figure A4.5: S-OAS Load-Displacement Curves

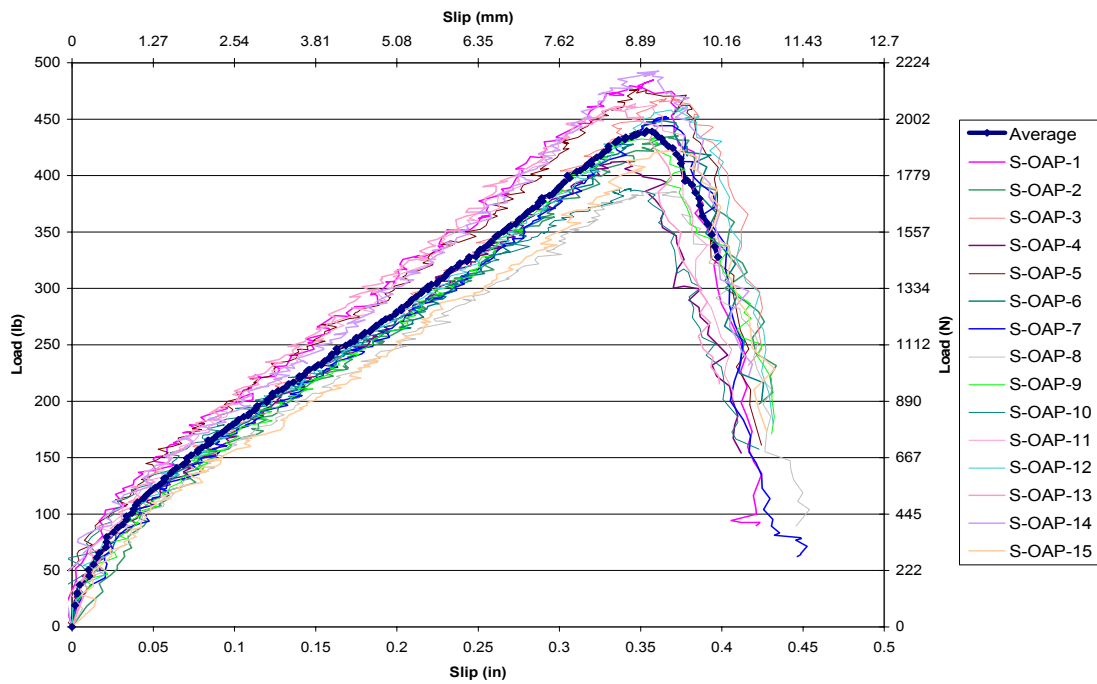


Figure A4.6: S-OAP Load-Displacement Curves

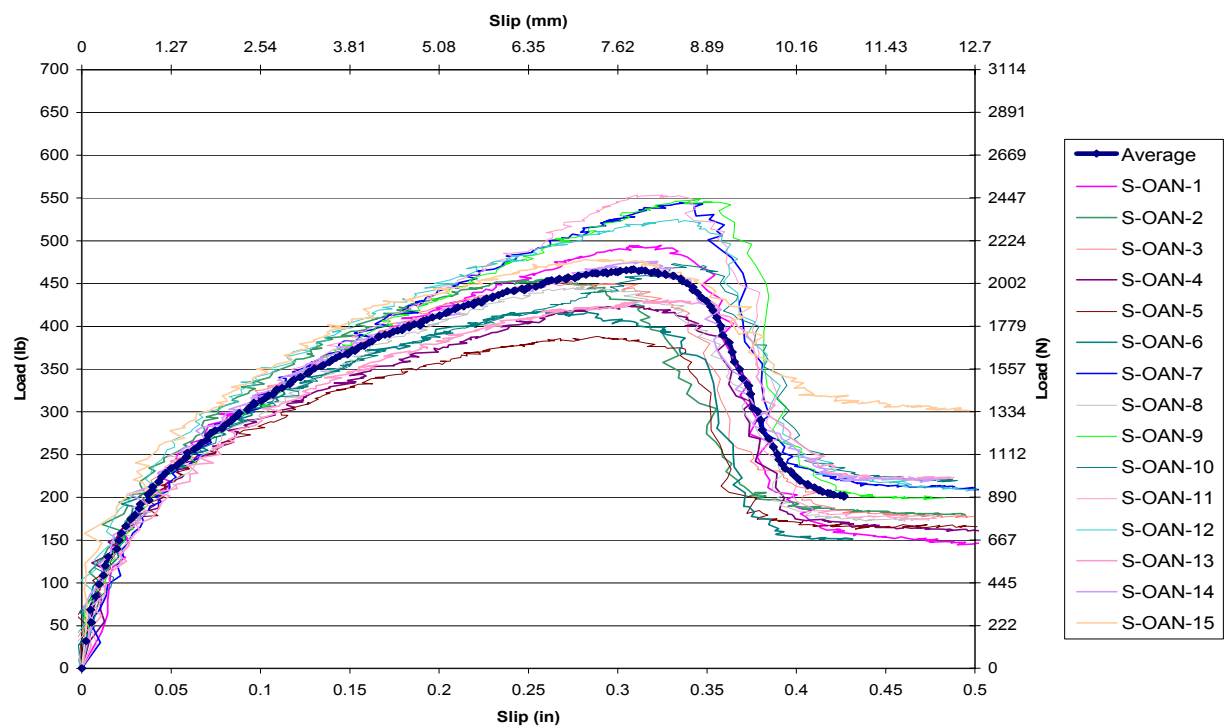


Figure A4.7: S-OAN Load-Displacement Curves

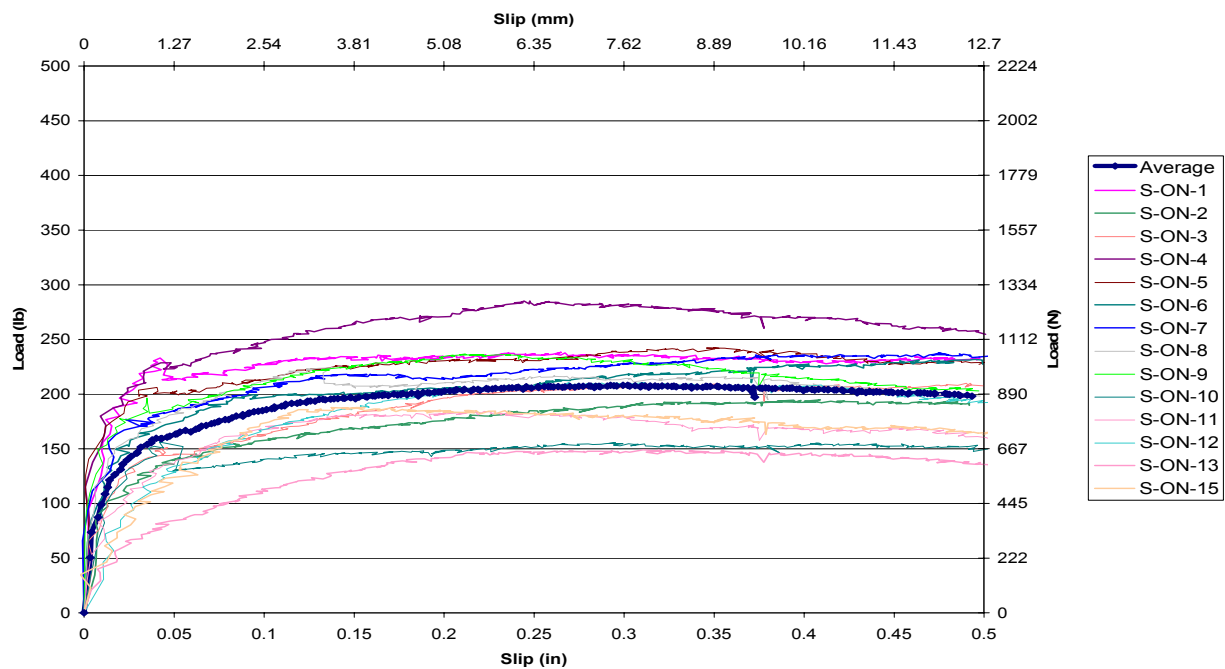


Figure A4.8: S-ON Load-Displacement Curves

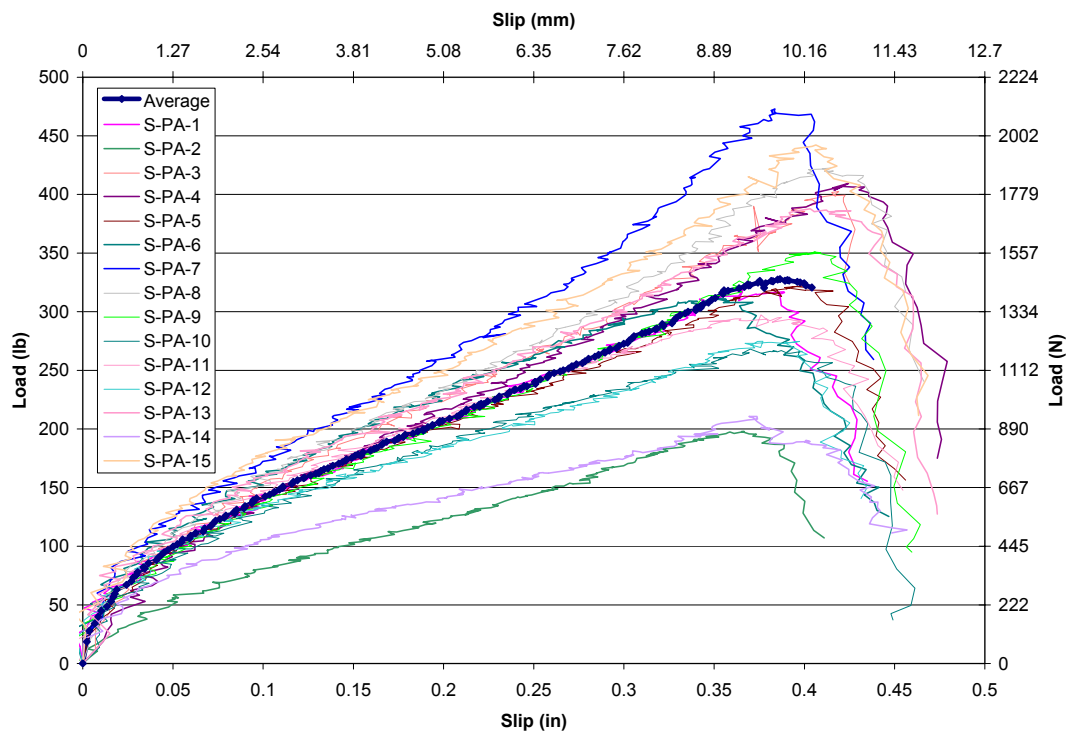


Figure A4.9: S-PA Load-Displacement Curves

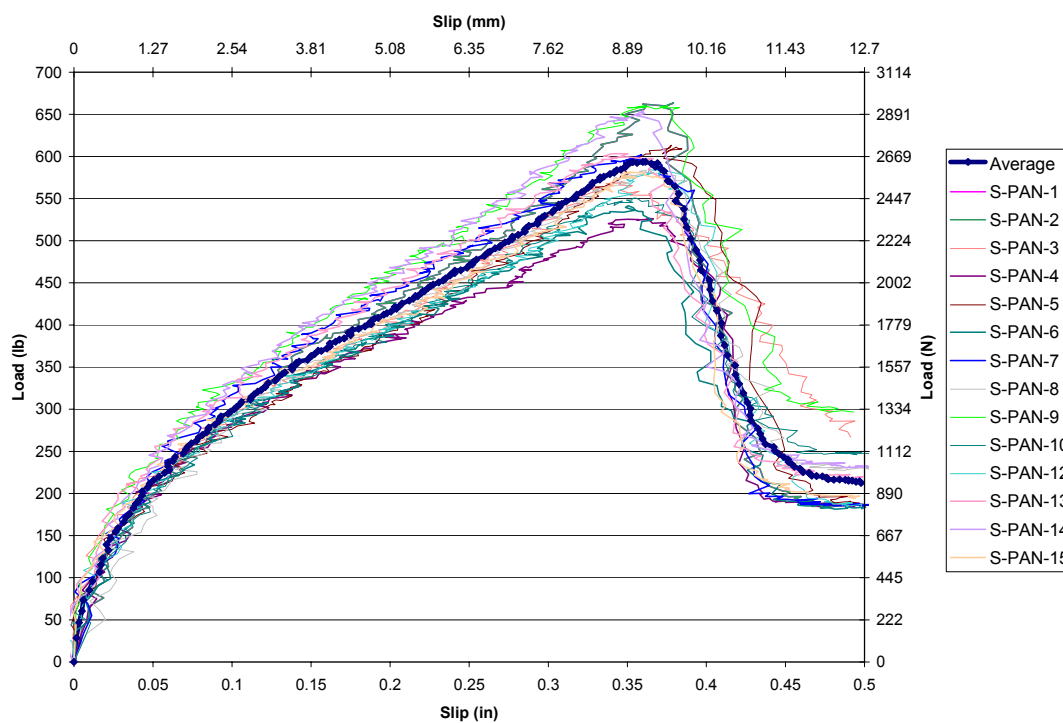


Figure A4.10: S-PAN Load-Displacement Curves

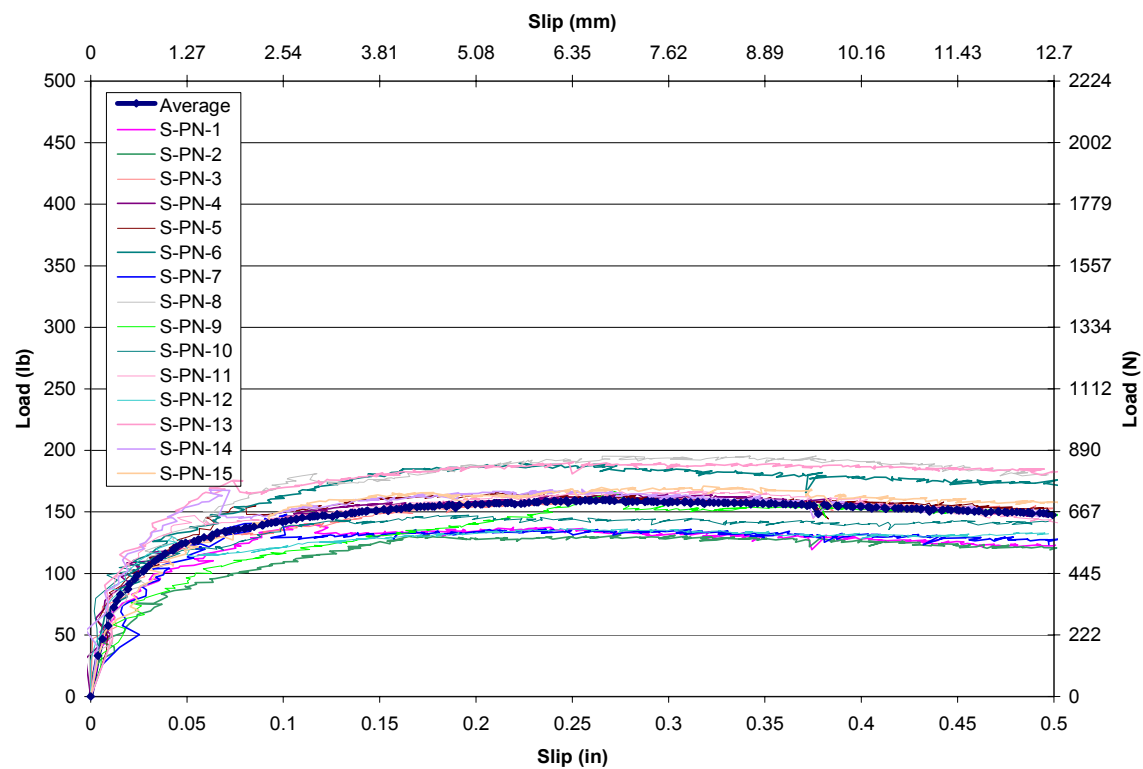


Figure A4.11: S-PN Load-Displacement Curves

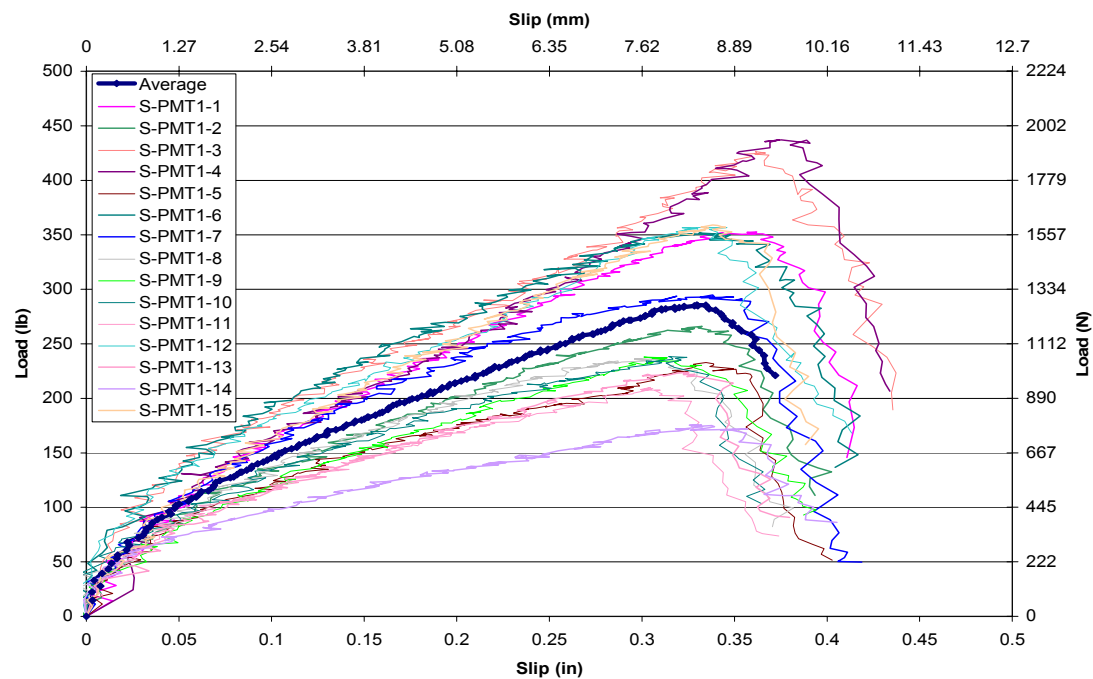


Figure A4.12: S-PMT1 Load-Displacement Curves

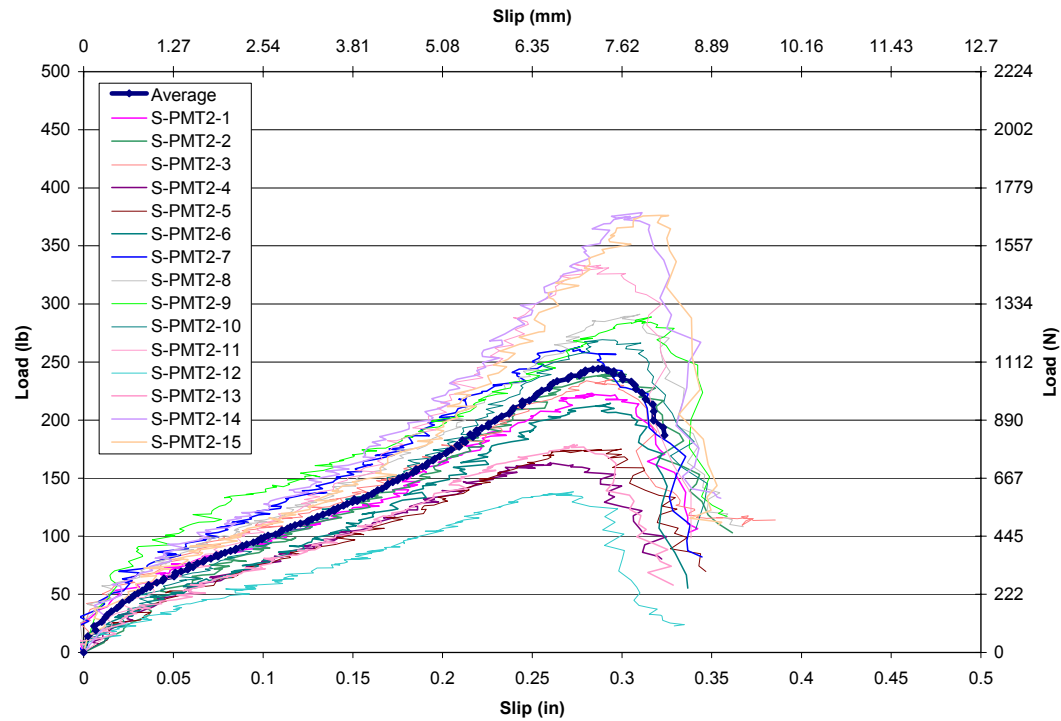


Figure A4.13: S-PMT2 Load-Displacement Curves

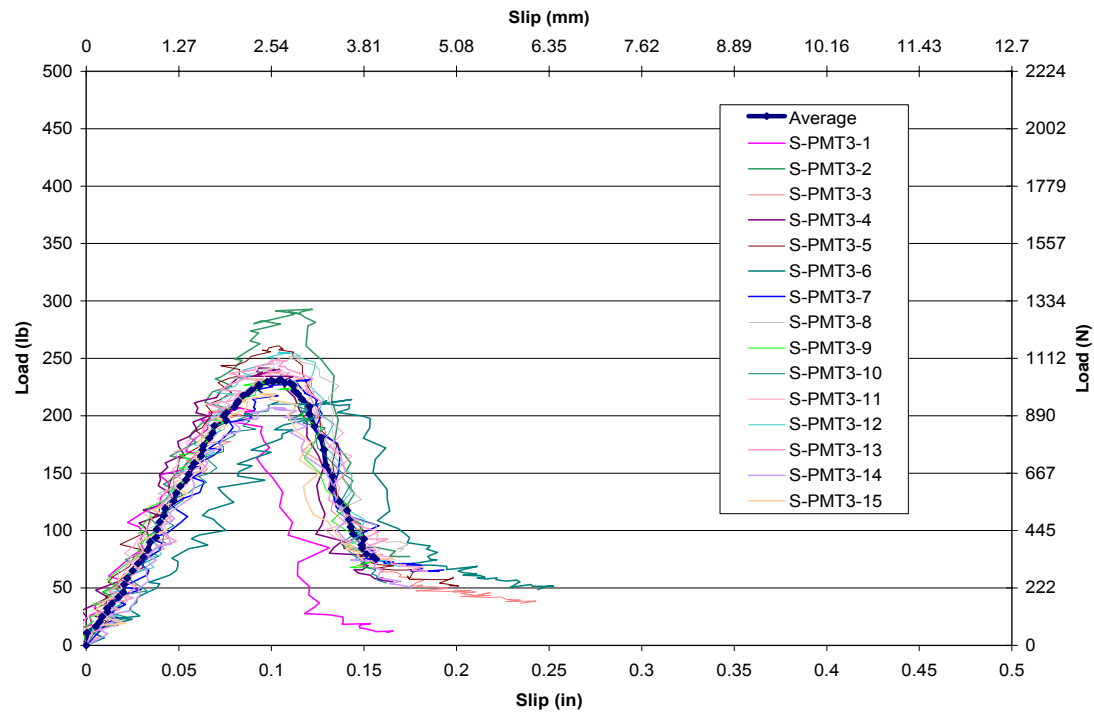


Figure A4.14: S-PMT3 Load-Displacement Curves

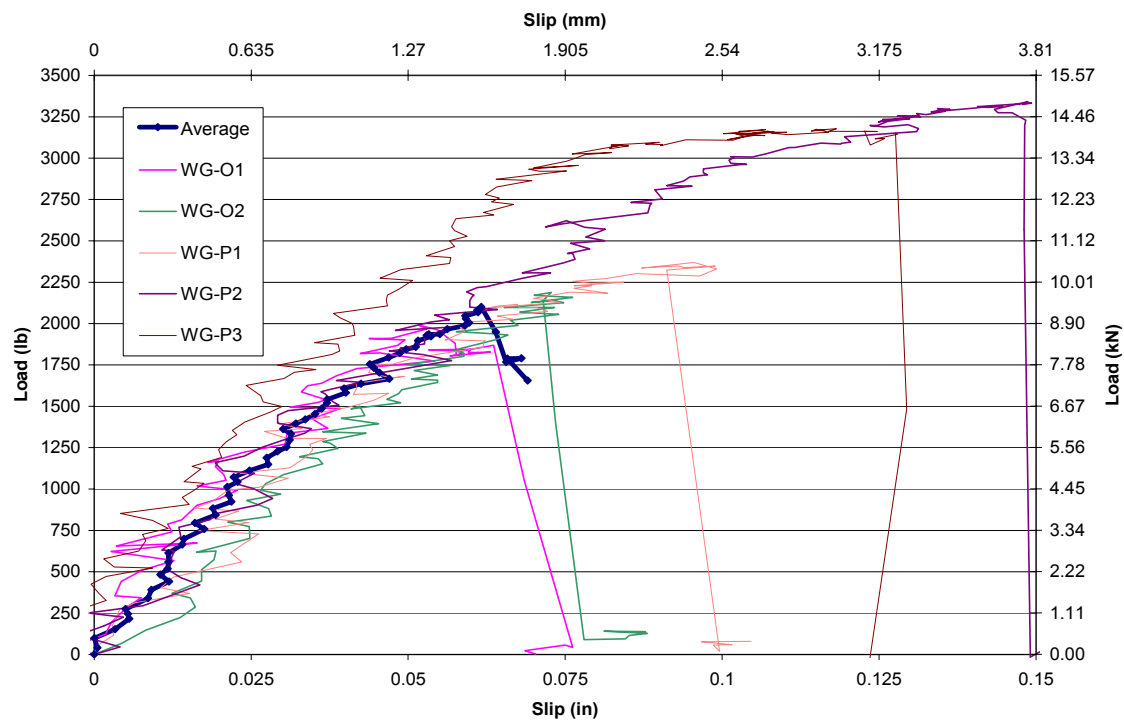


Figure A4.15: Wood Glue Load-Displacement Curves

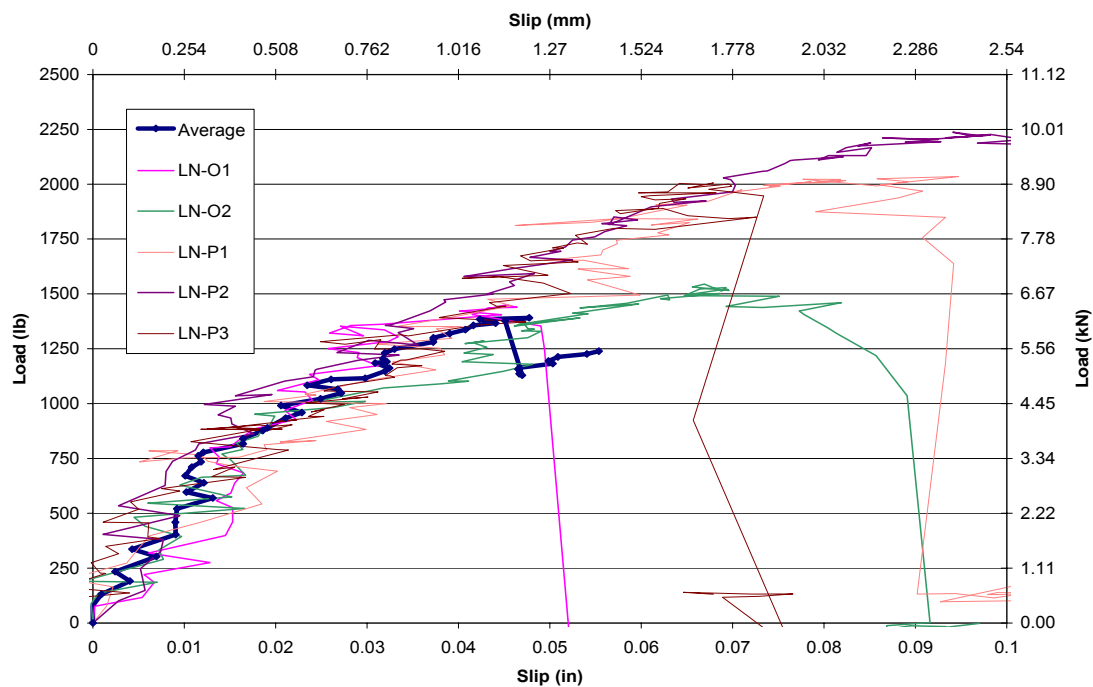


Figure A4.16: Liquid Nails Load-Displacement Curves

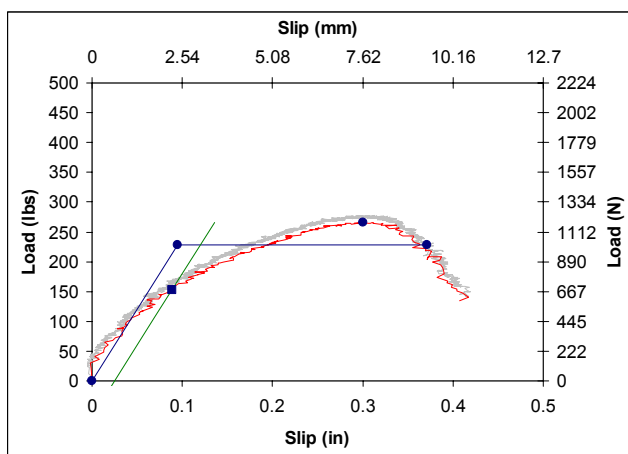


Figure A4.17: S-OA-1

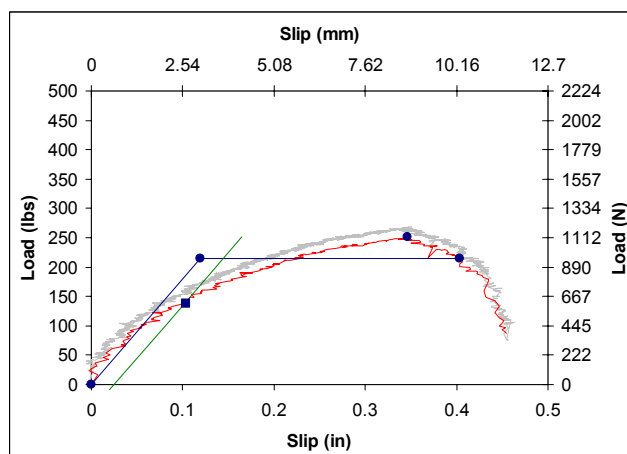


Figure A4.18: S-OA-2

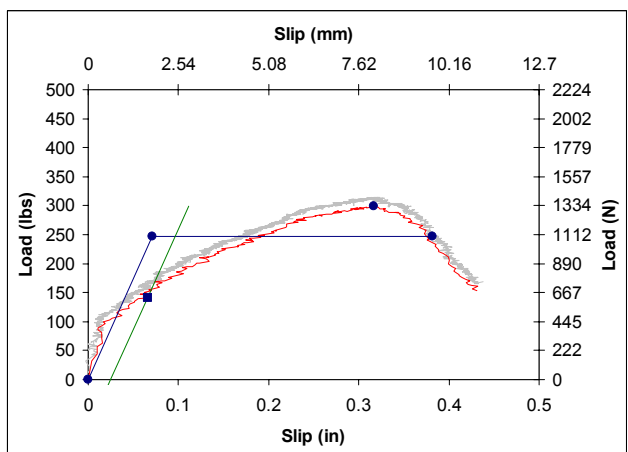


Figure A4.19: S-OA-3

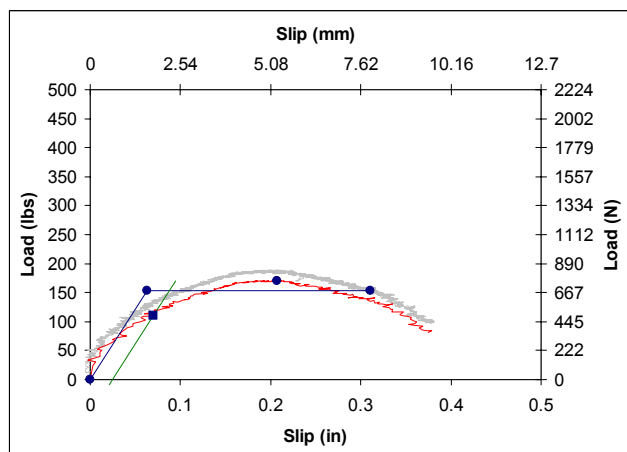


Figure A4.20: S-OA-4

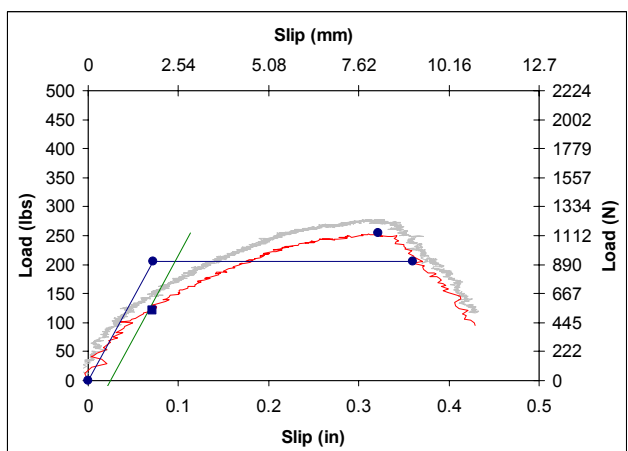


Figure A4.21: S-OA-5

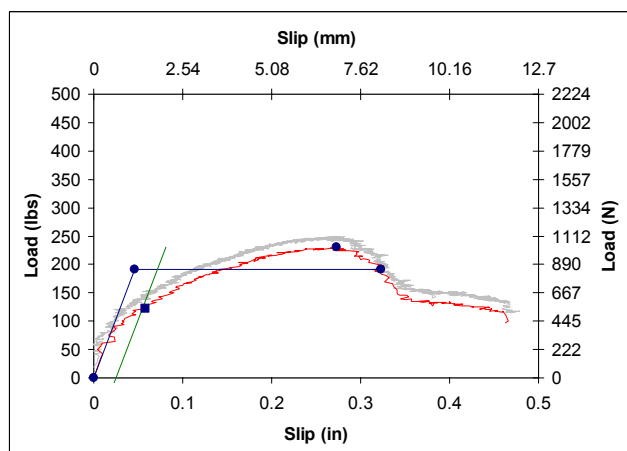


Figure A4.22: S-OA-6

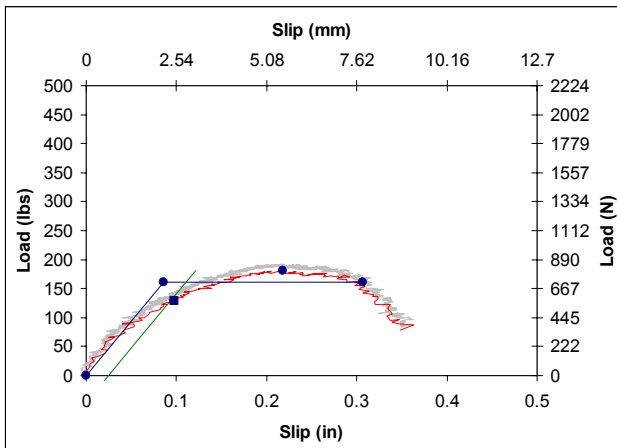


Figure A4.23: S-OA-7

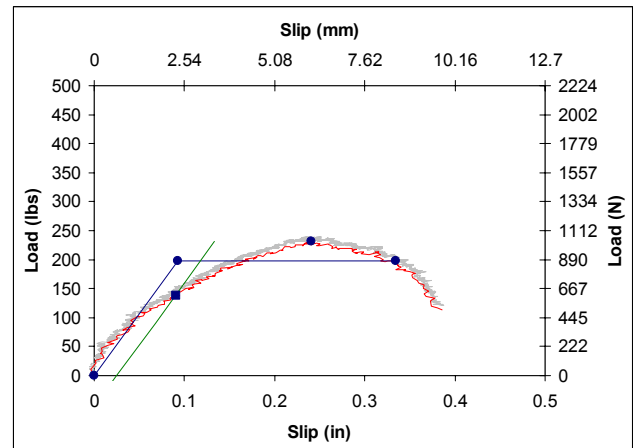


Figure A4.24: S-OA-9

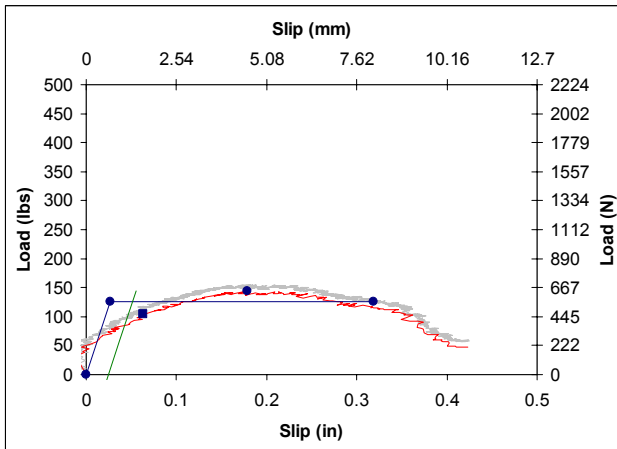


Figure A4.25: S-OA-10

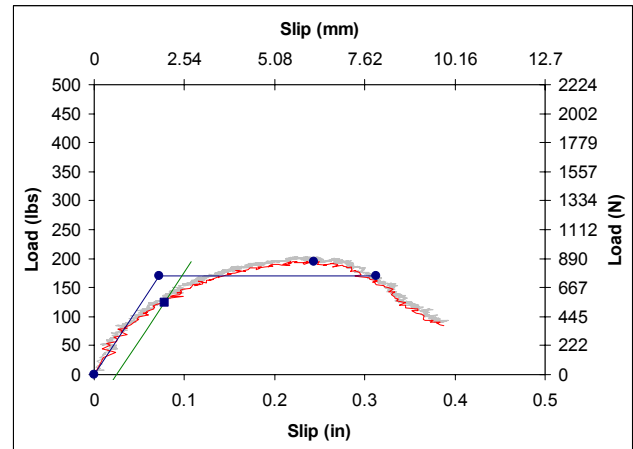


Figure A4.26: S-OA-11

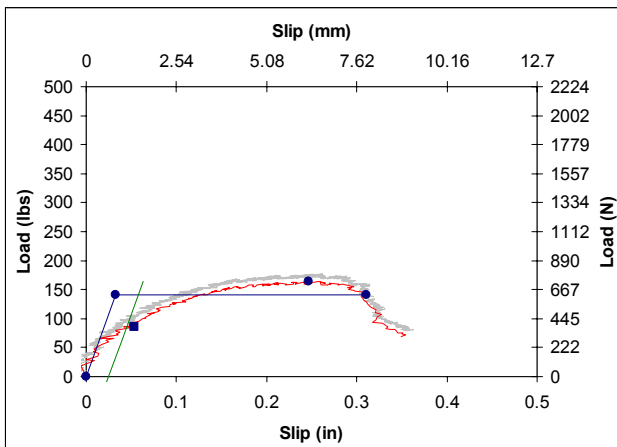


Figure A4.27: S-OA-12

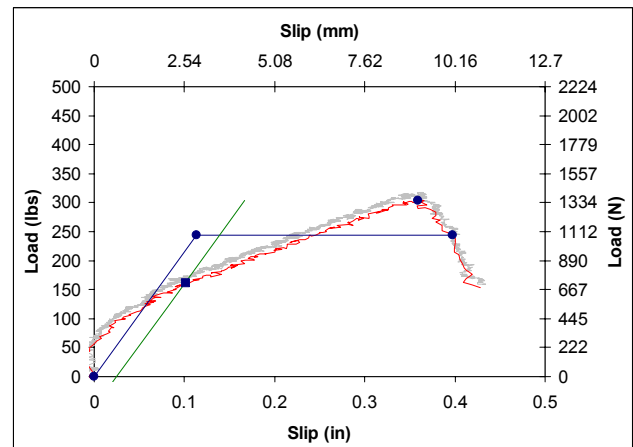


Figure A4.28: S-OA-13

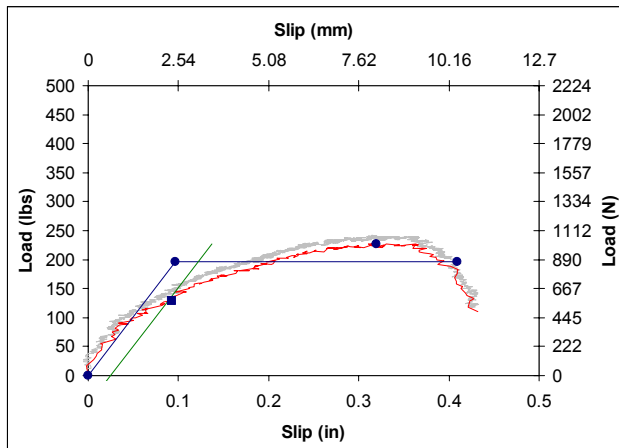


Figure A4.29: S-OA-14

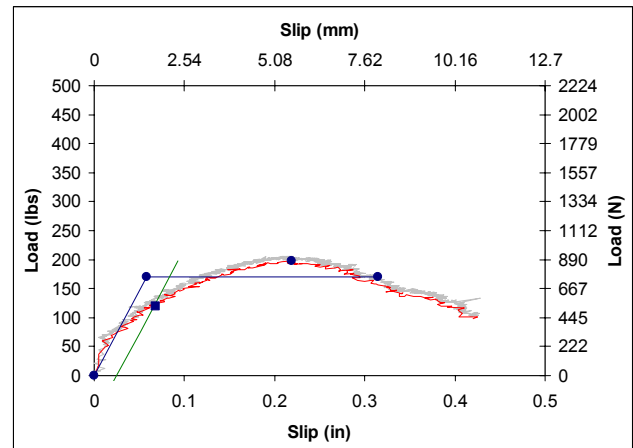


Figure A4.30: S-OA-15

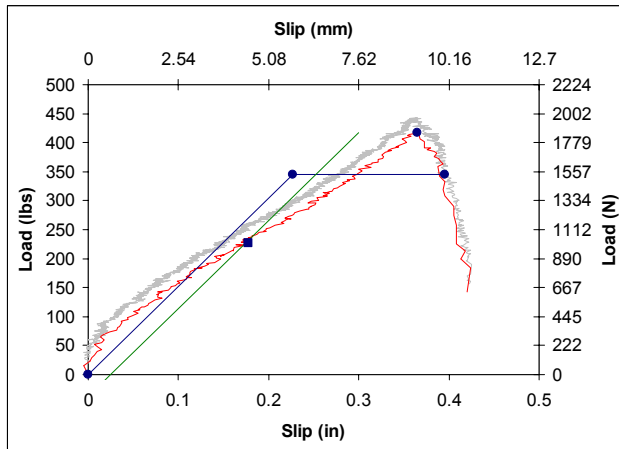


Figure A4.31: S-OAS-1

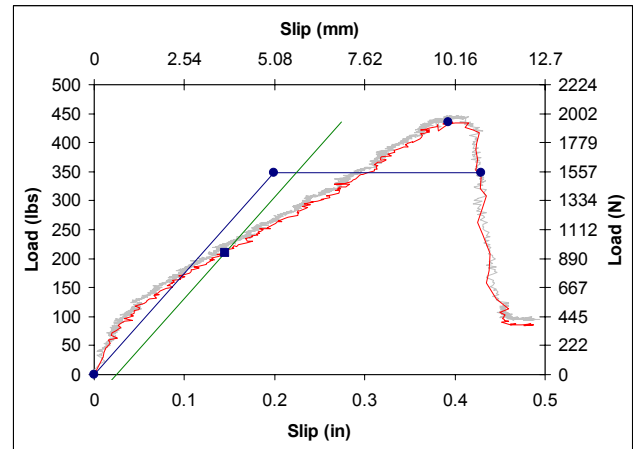


Figure A4.32: S-OAS-2

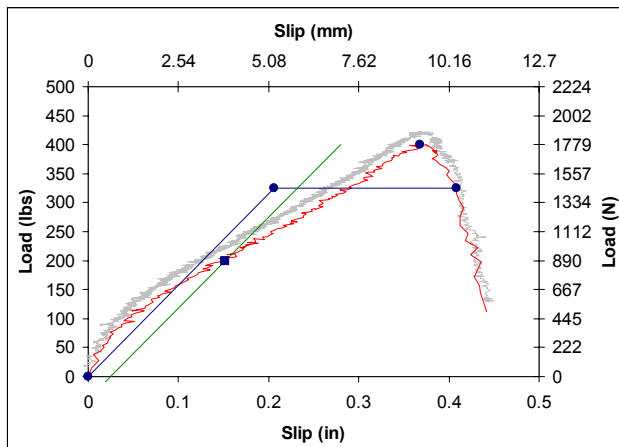


Figure A4.33: S-OAS-3

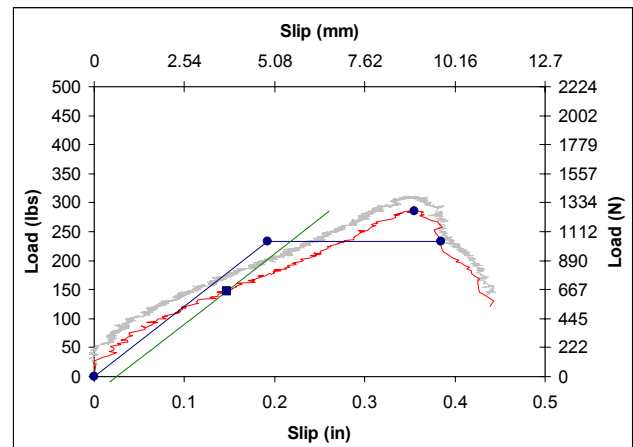


Figure A4.34: S-OAS-4

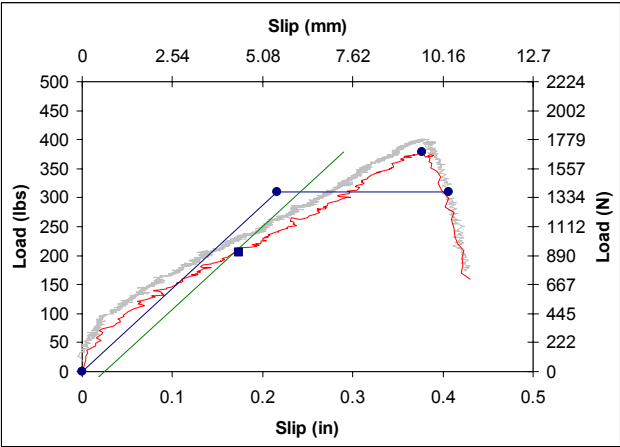


Figure A4.35: S-OAS-5

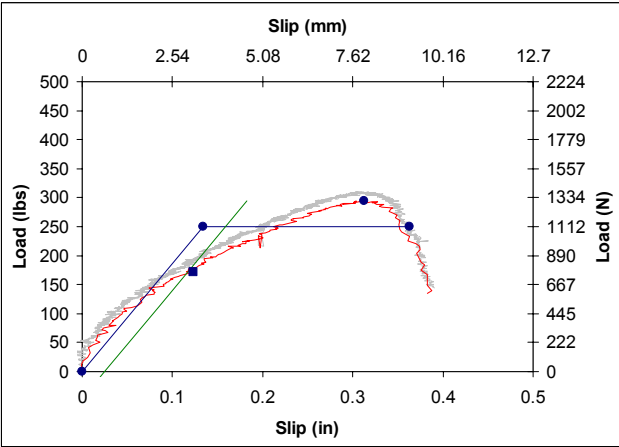


Figure A4.36: S-OAS-6

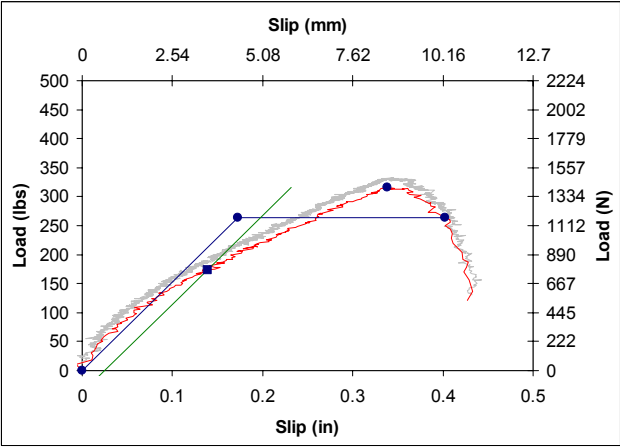


Figure A4.37: S-OAS-7

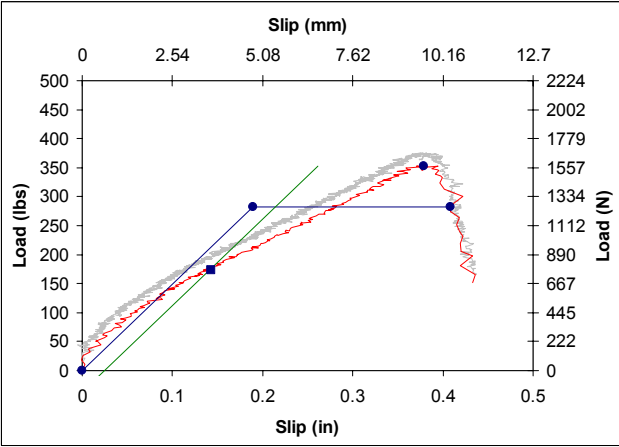


Figure A4.38: S-OAS-8

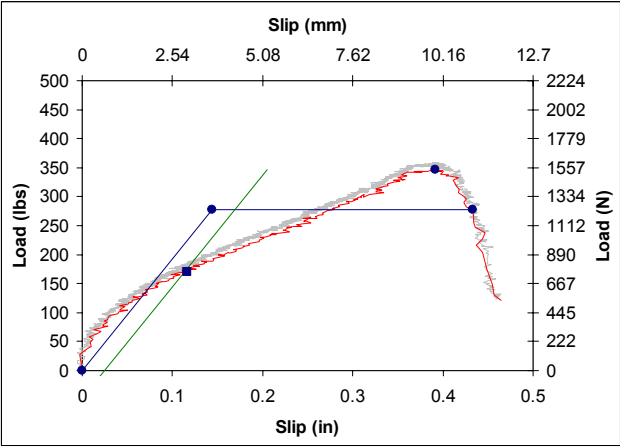


Figure A4.39: S-OAS-9

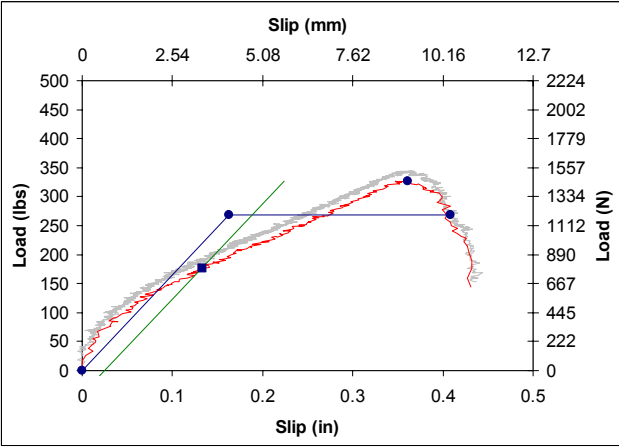


Figure A4.40: S-OAS-10

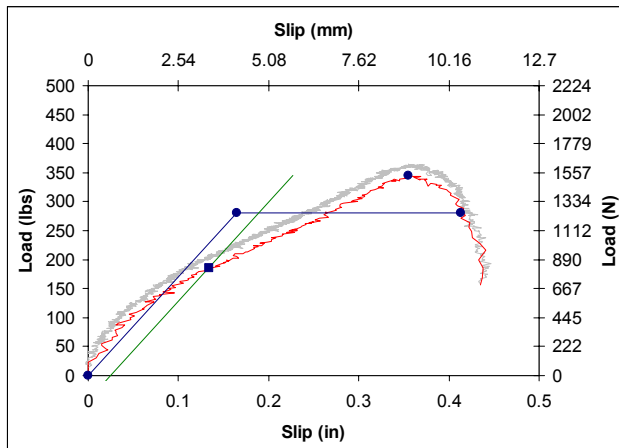


Figure A4.41: S-OAS-11

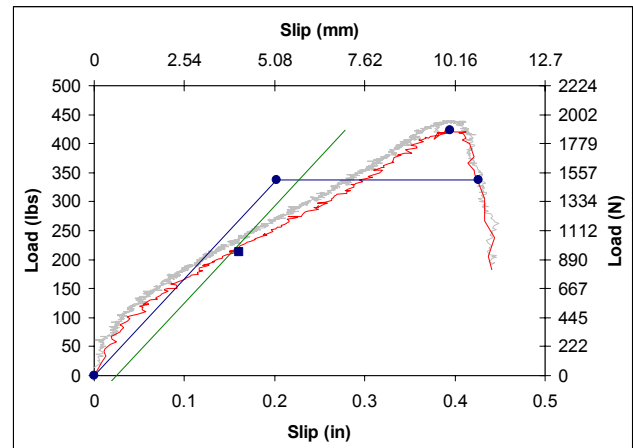


Figure A4.42: S-OAS-12

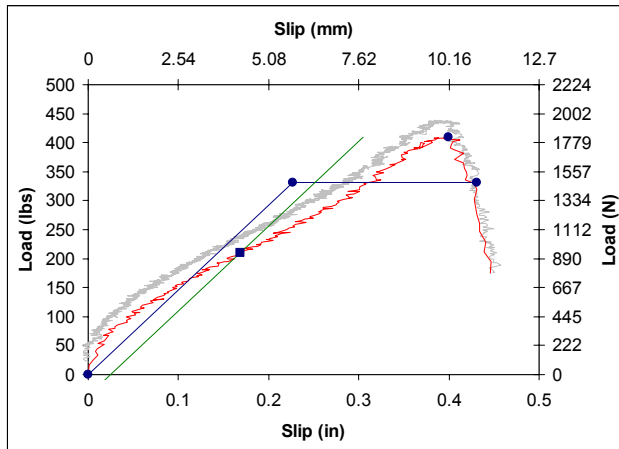


Figure A4.43: S-OAS-13

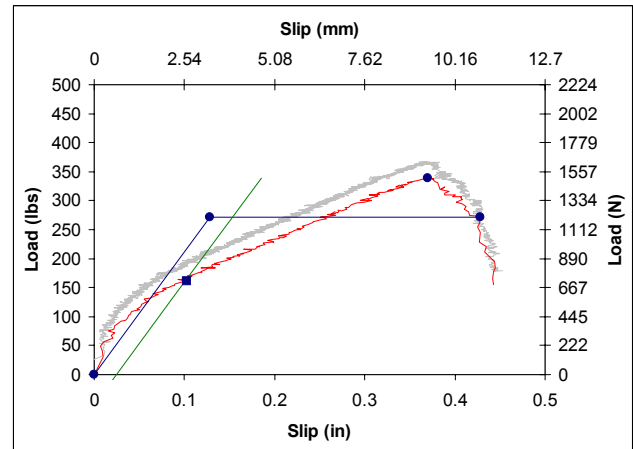


Figure A4.44: S-OAS-14

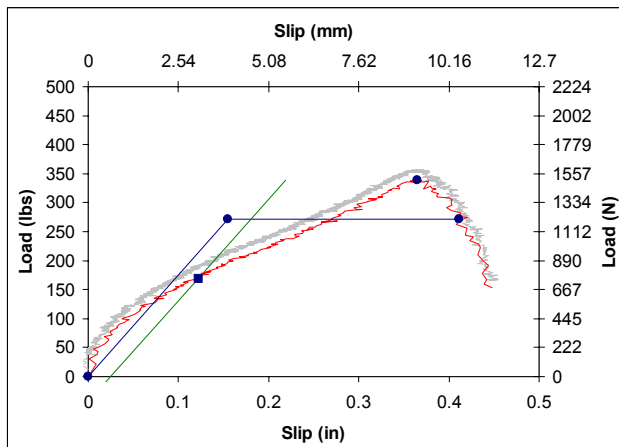


Figure A4.45: S-OAS-15

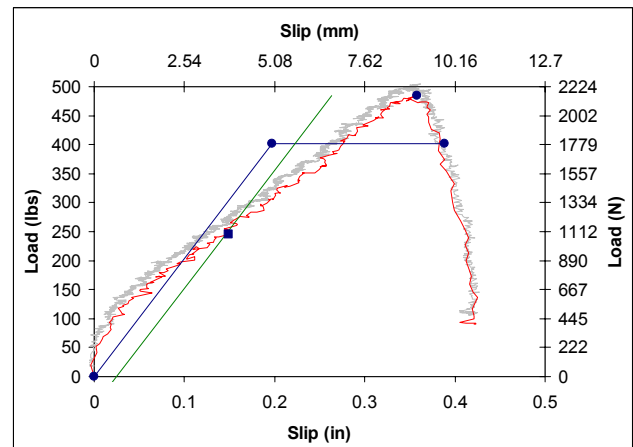


Figure A4.46: S-OAP-1

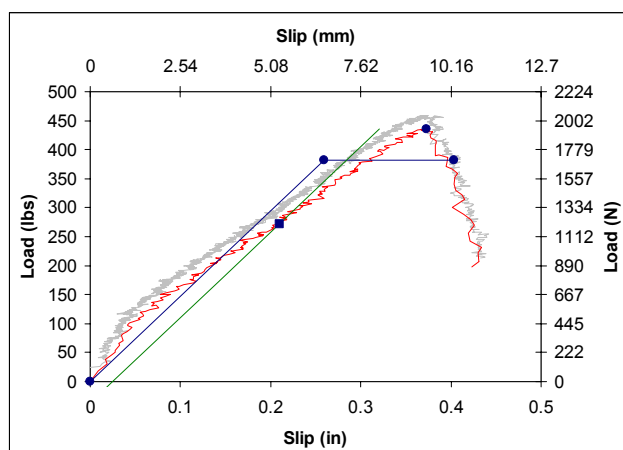


Figure A4.47: S-OAP-2

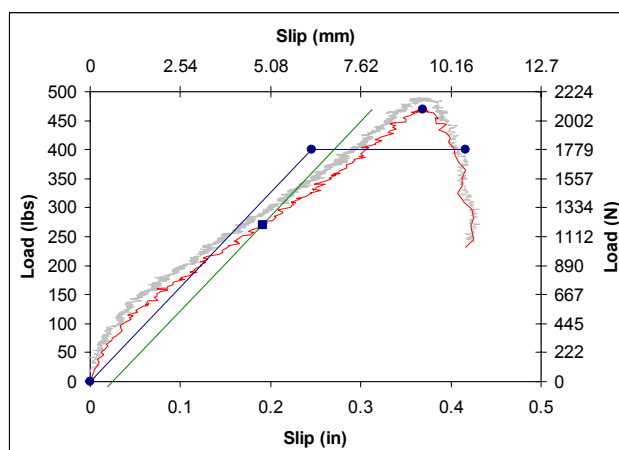


Figure A4.48: S-OAP-3

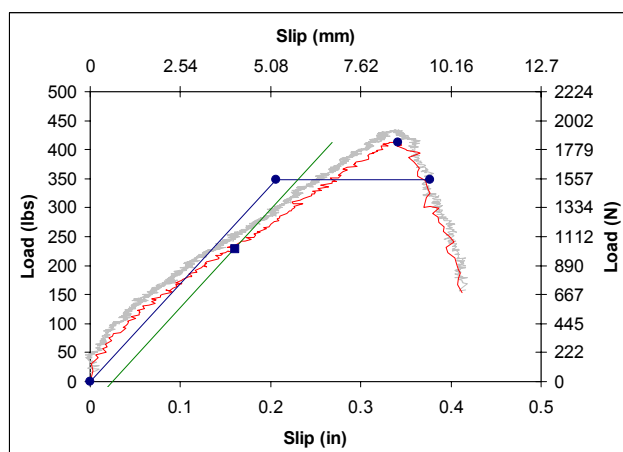


Figure A4.49: S-OAP-4

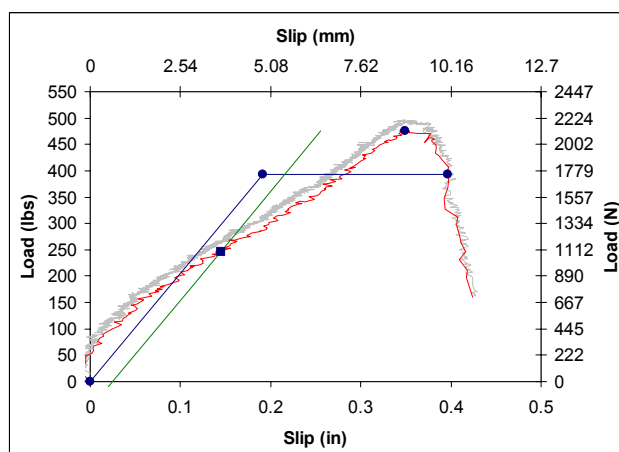


Figure A4.50: S-OAP-5

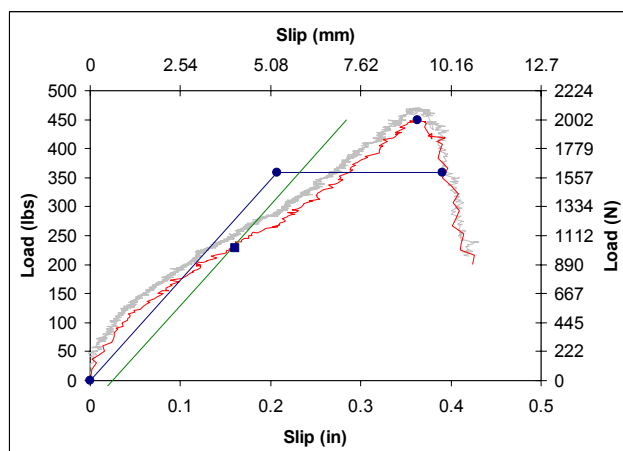


Figure A4.51: S-OAP-6

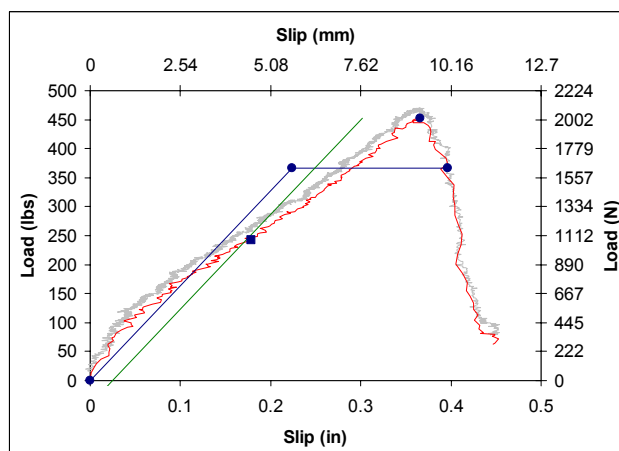


Figure A4.52: S-OAP-7

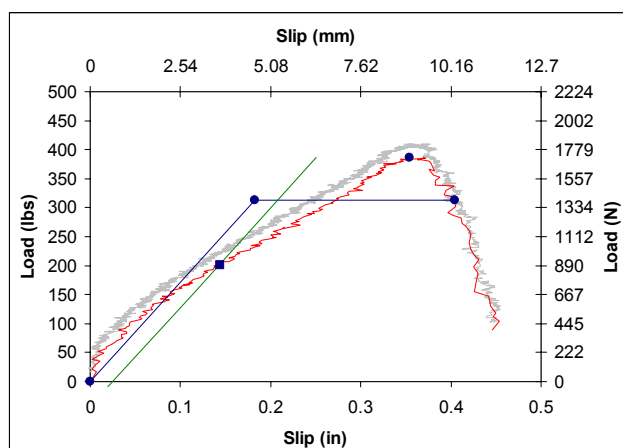


Figure A4.53: S-OAP-8

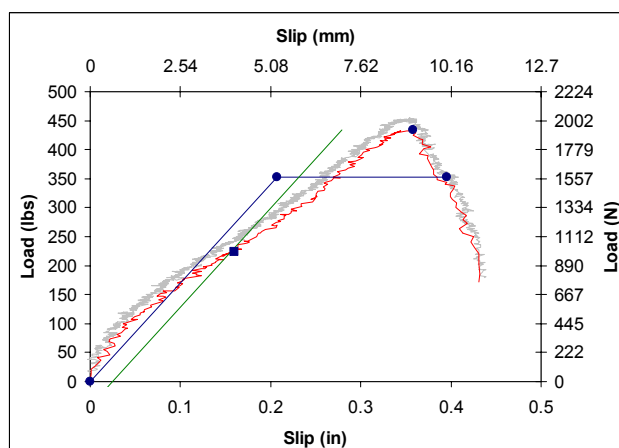


Figure A4.54: S-OAP-9

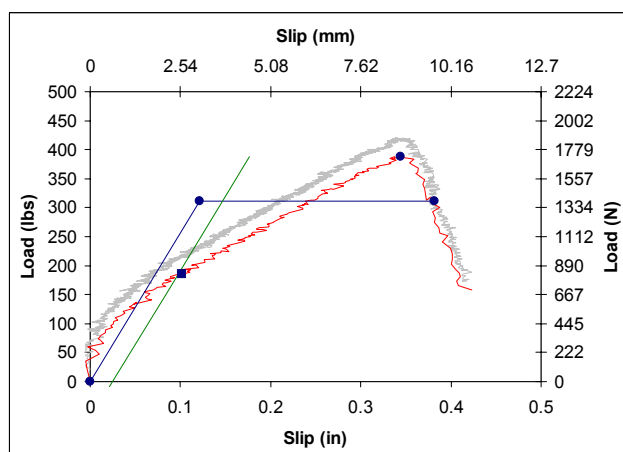


Figure A4.55: S-OAP-10

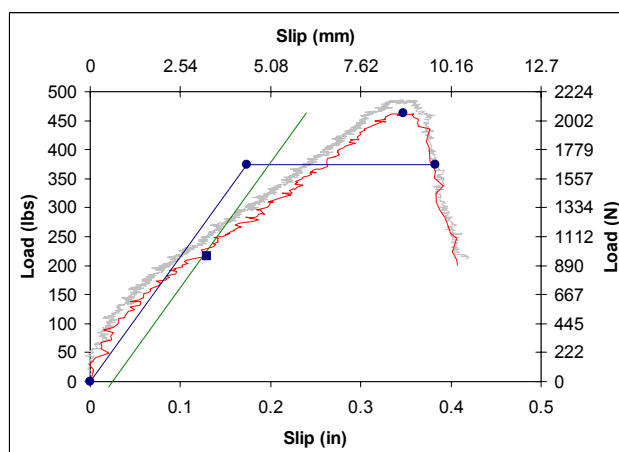


Figure A4.56: S-OAP-11

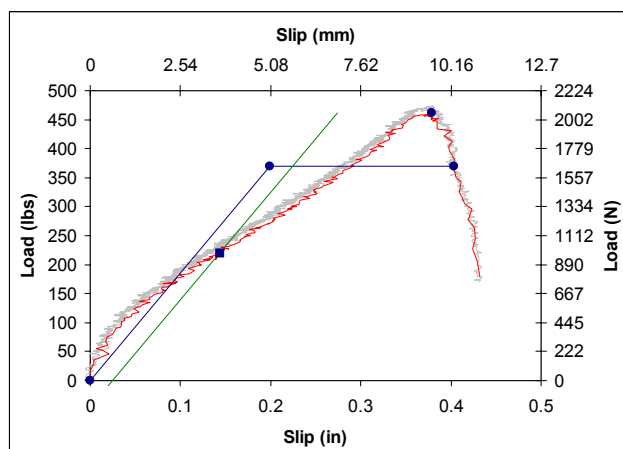


Figure A4.57: S-OAP-12

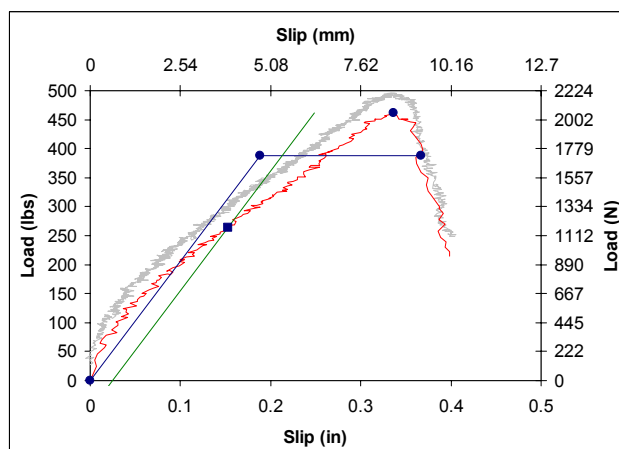


Figure A4.58: S-OAP-13

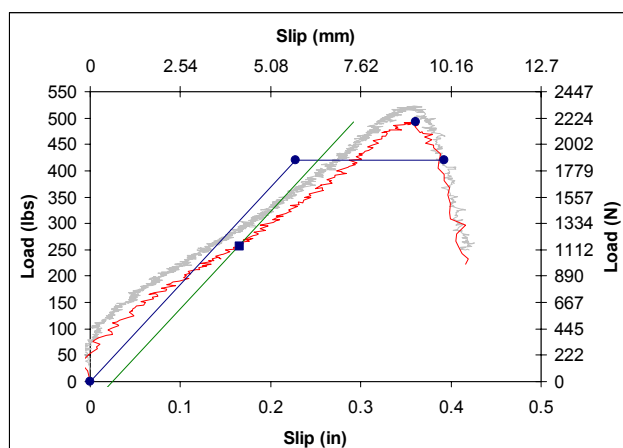


Figure A4.59: S-OAP-14

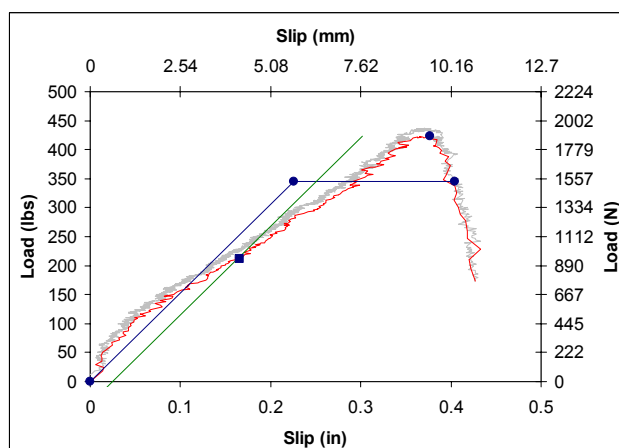


Figure A4.60: S-OAP-15

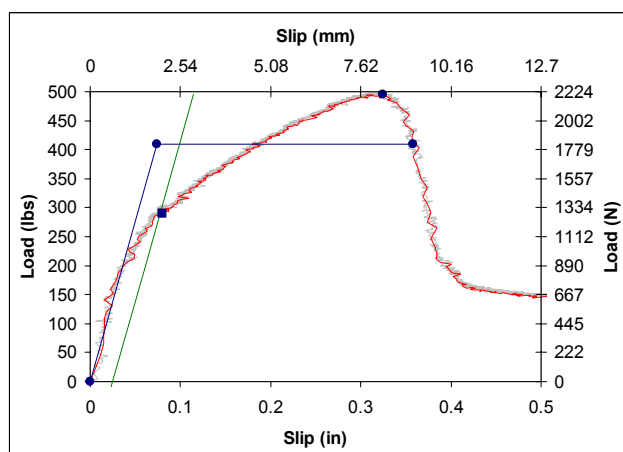


Figure A4.61: S-OAN-1

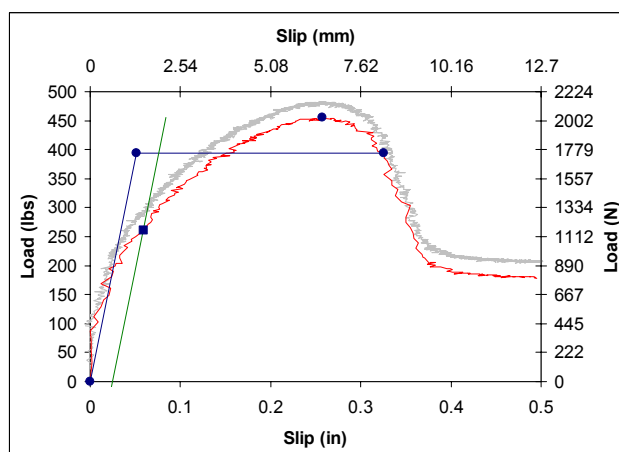


Figure A4.62: S-OAN-2

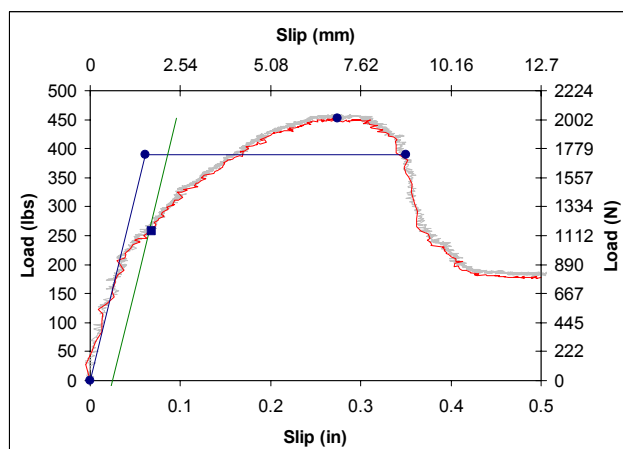


Figure A4.63: S-OAN-3

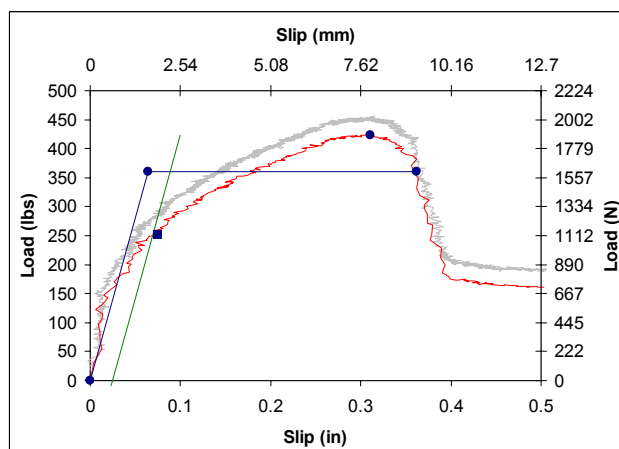


Figure A4.64: S-OAN-4

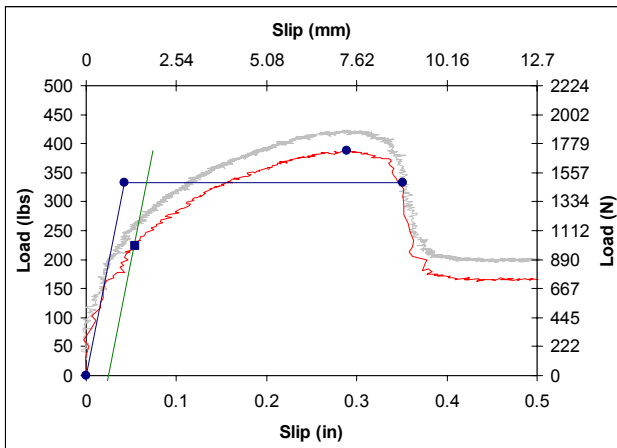


Figure A4.65: S-OAN-5

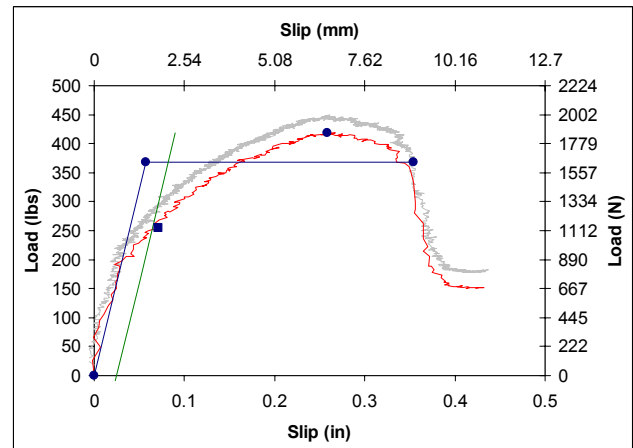


Figure A4.66: S-OAN-6

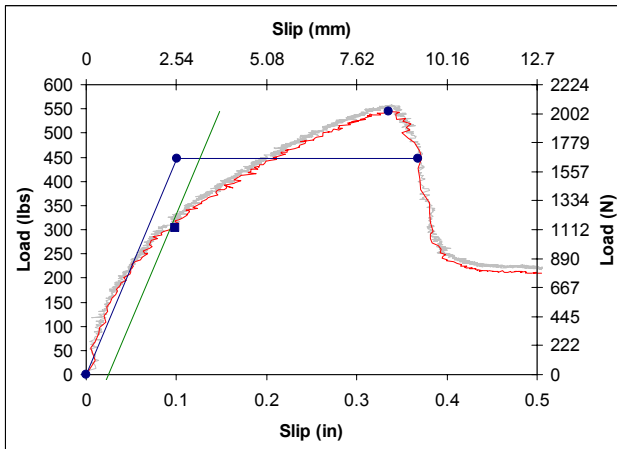


Figure A4.67: S-OAN-7

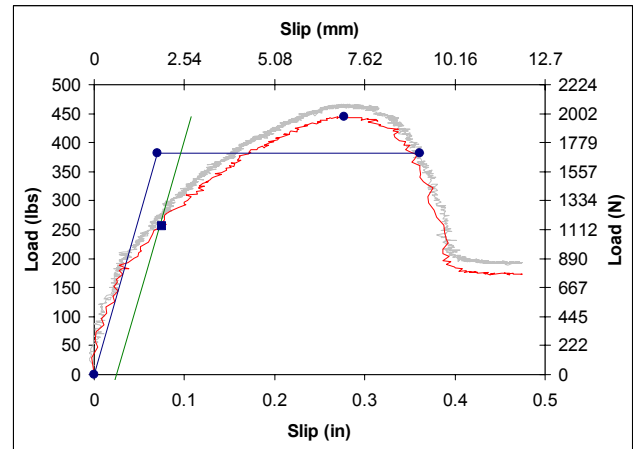


Figure A4.68: S-OAN-8

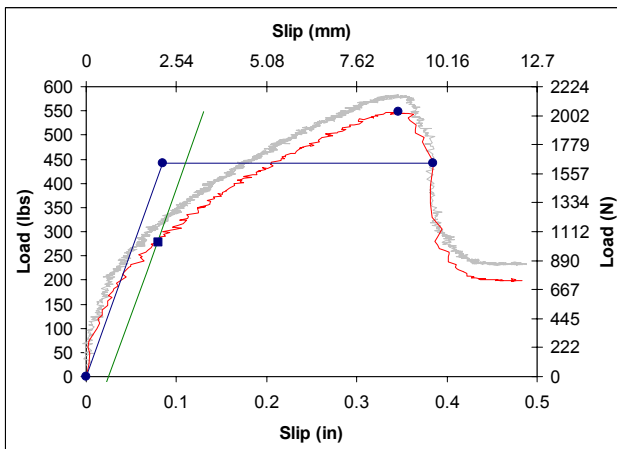


Figure A4.69: S-OAN-9

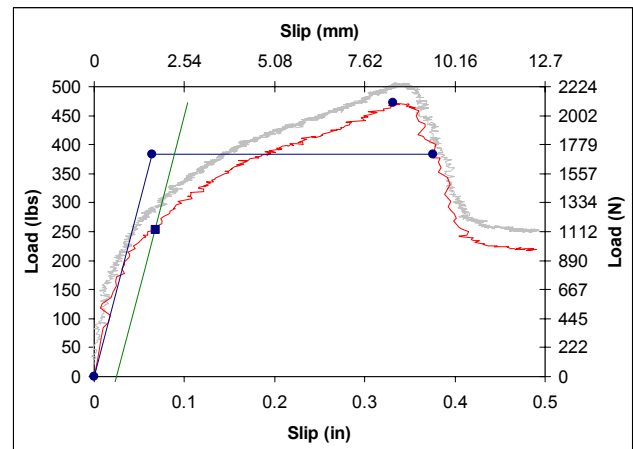


Figure A4.70: S-OAN-10

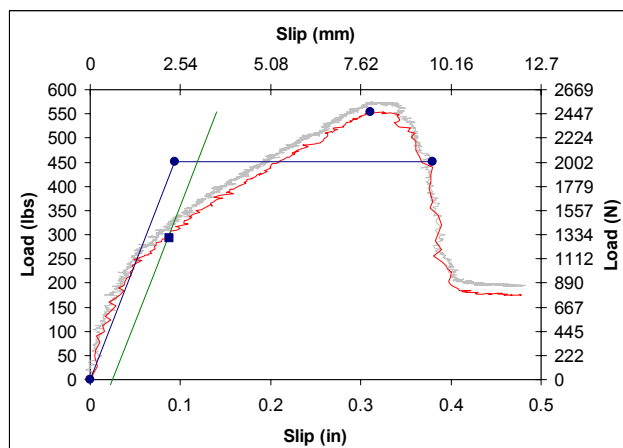


Figure A4.71: S-OAN-11

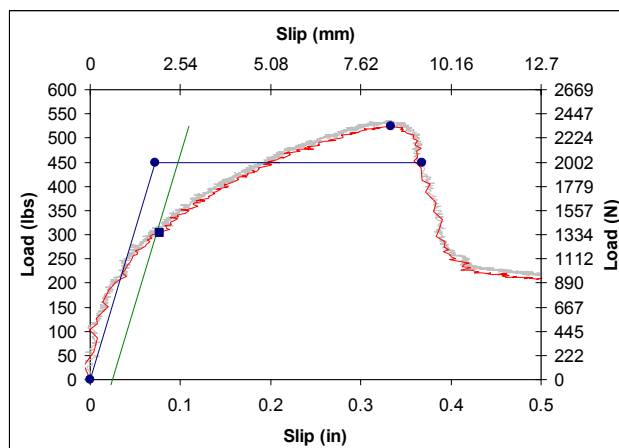


Figure A4.72: S-OAN-12

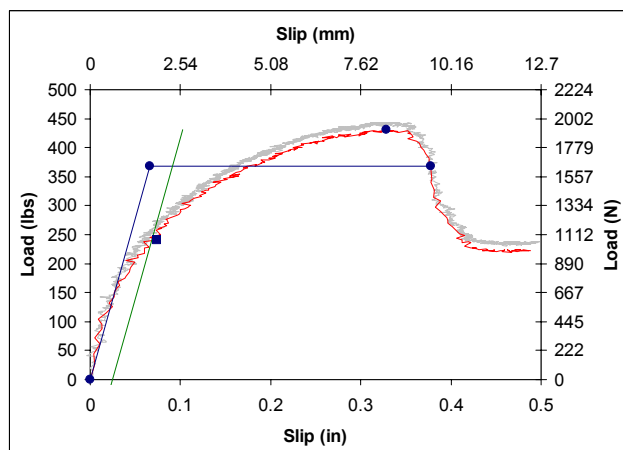


Figure A4.73: S-OAN-13

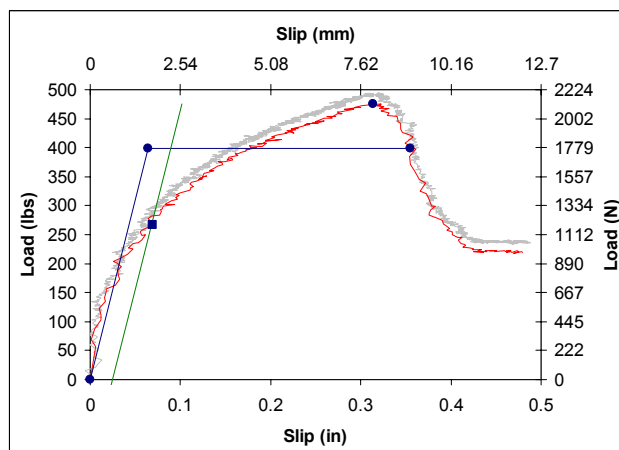


Figure A4.74: S-OAN-14

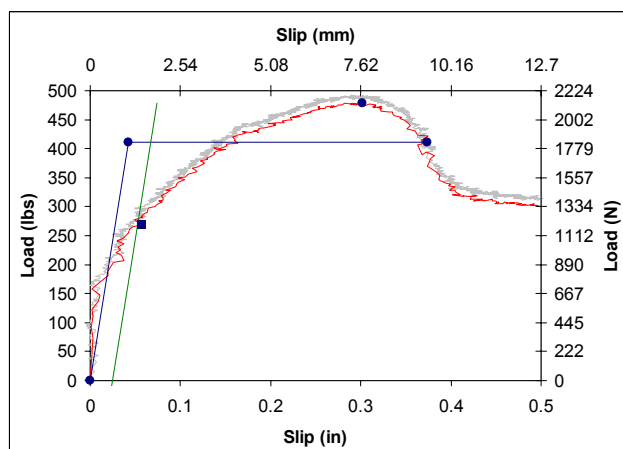


Figure A4.75: S-OAN-15

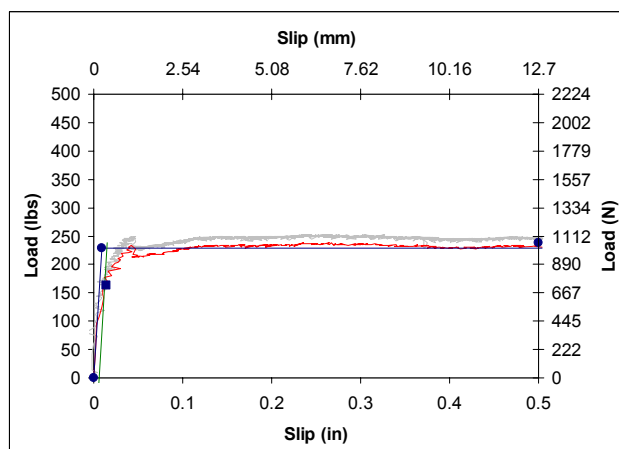


Figure A4.76: S-ON-1

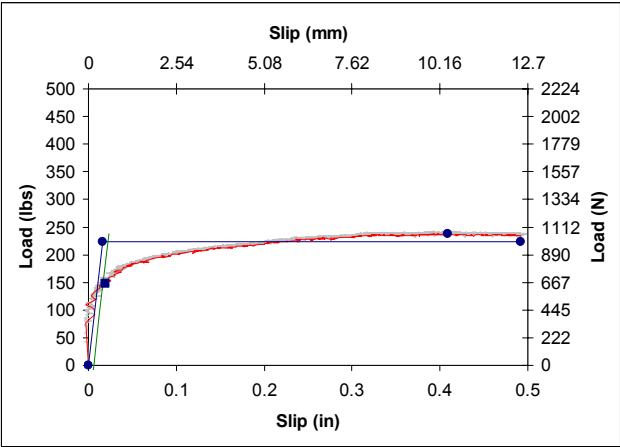


Figure A4.77: S-ON-2

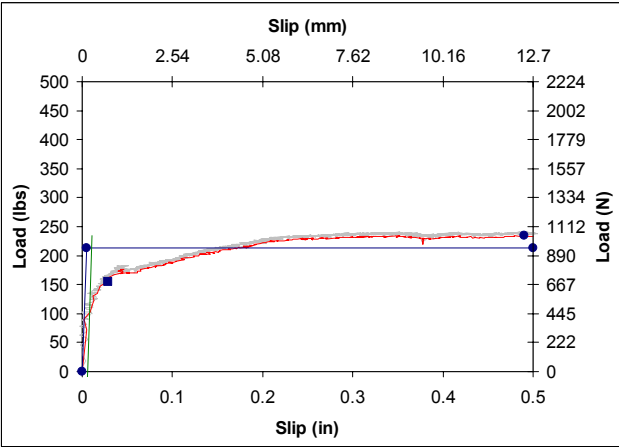


Figure A4.78: S-ON-3

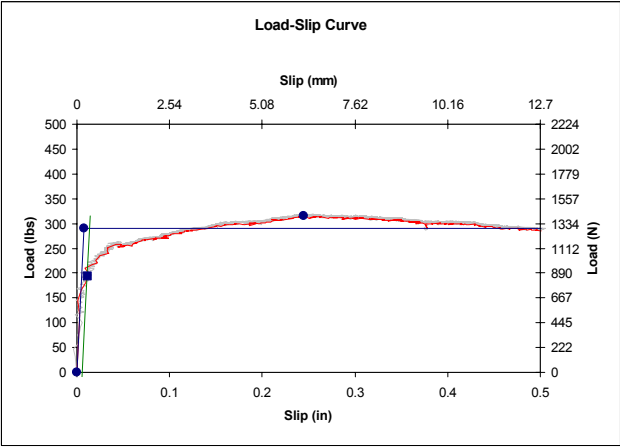


Figure A4.79: S-ON-4

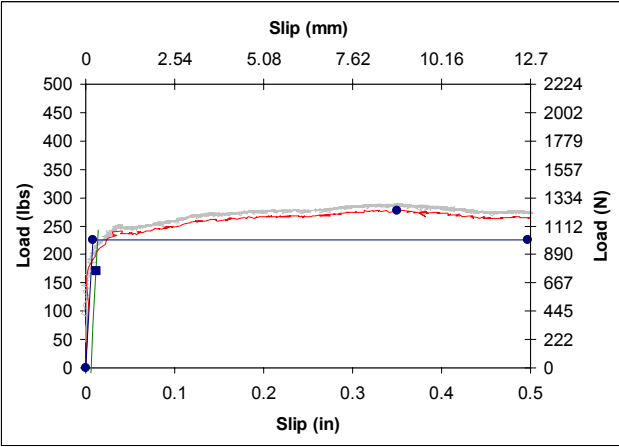


Figure A4.80: S-ON-5

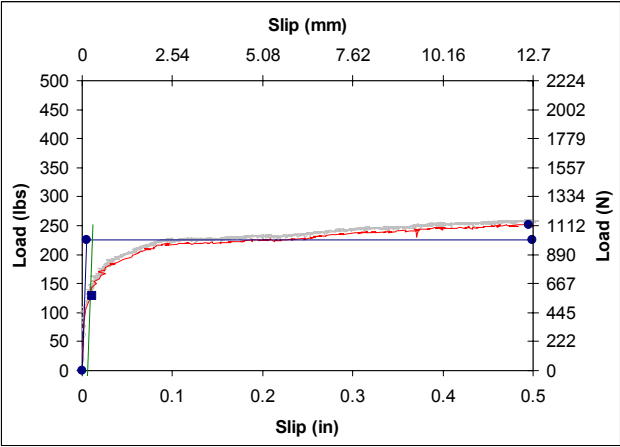


Figure A4.81: S-ON-6

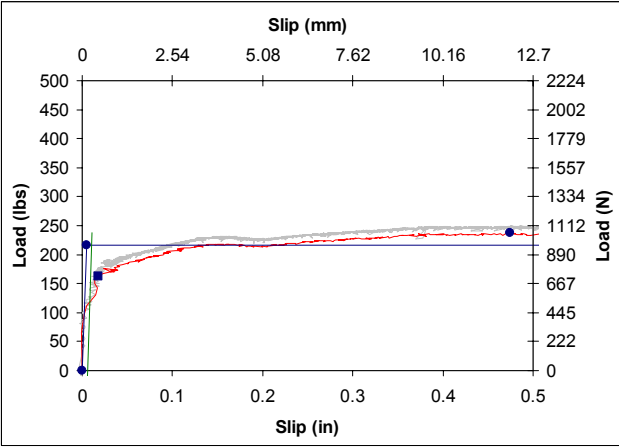


Figure A4.82: S-ON-7

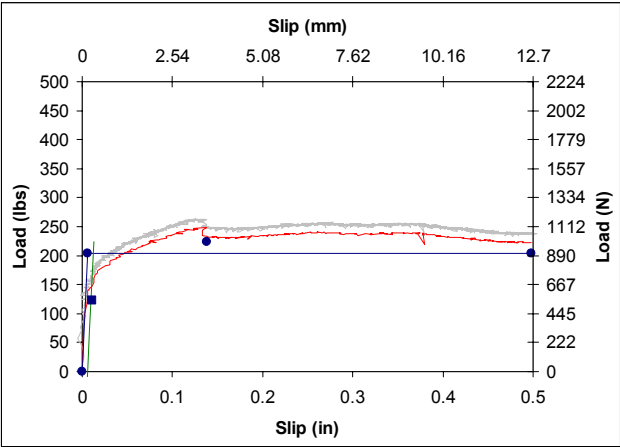


Figure A4.83: S-ON-8

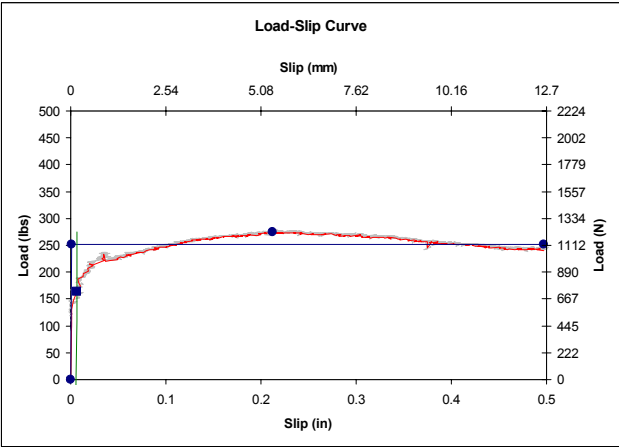


Figure A4.84: S-ON-9

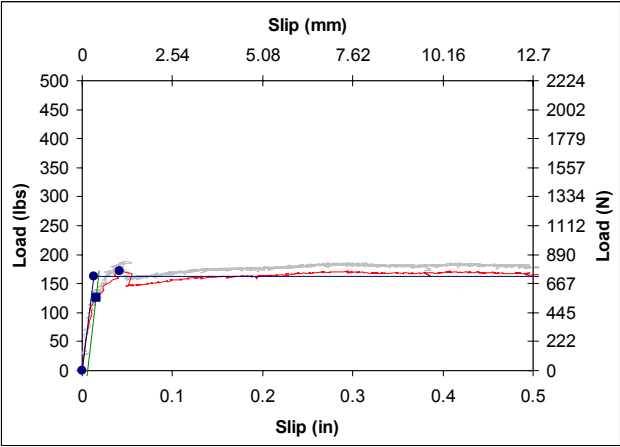


Figure A4.85: S-ON-10

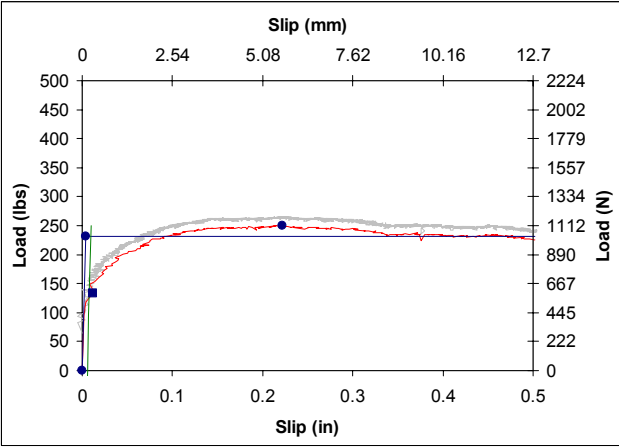


Figure A4.86: S-ON-11

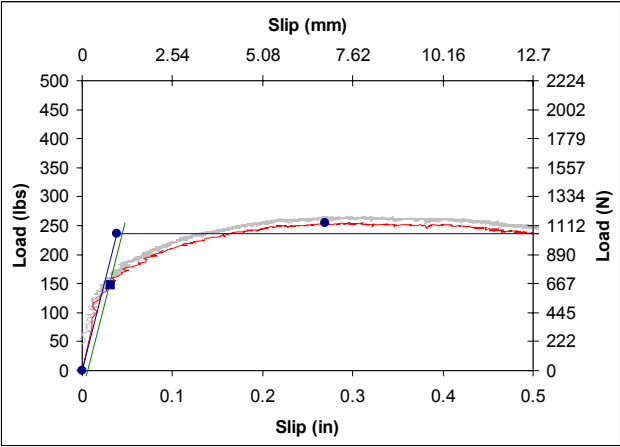


Figure A4.87: S-ON-12

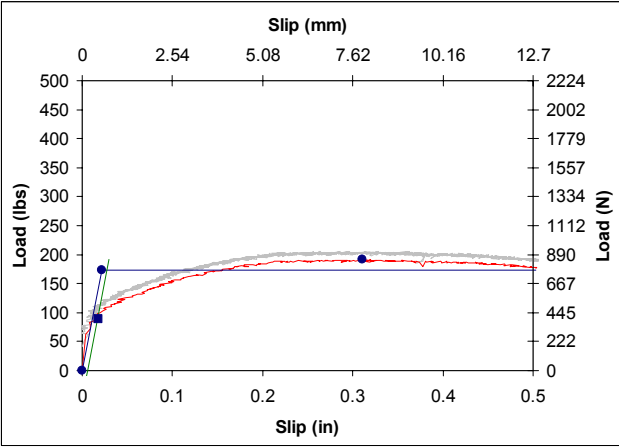


Figure A4.88: S-ON-13

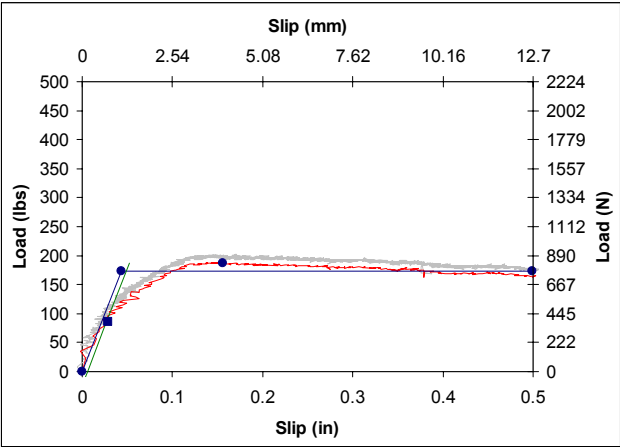


Figure A4.89: S-ON-15

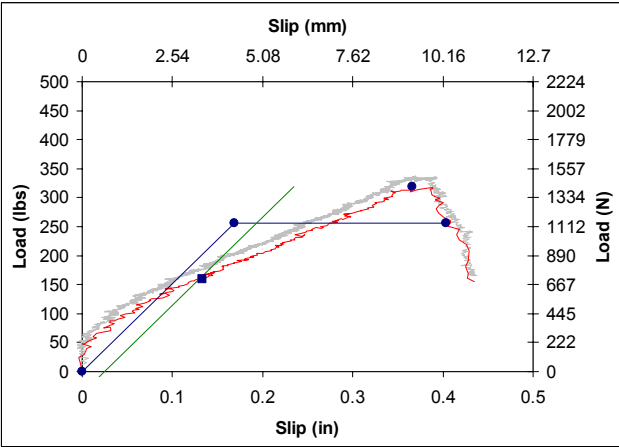


Figure A4.90: S-PA-1

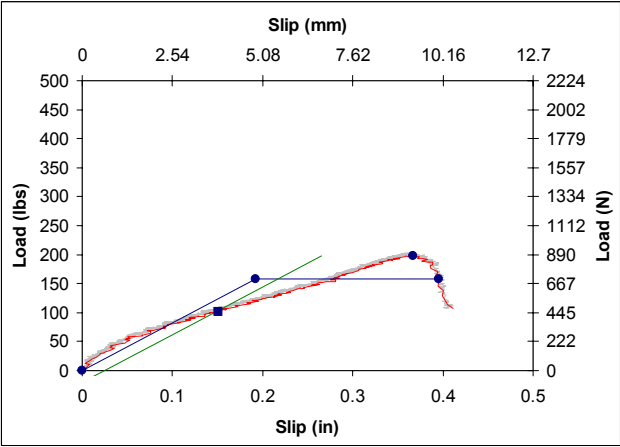


Figure A4.91: S-PA-2

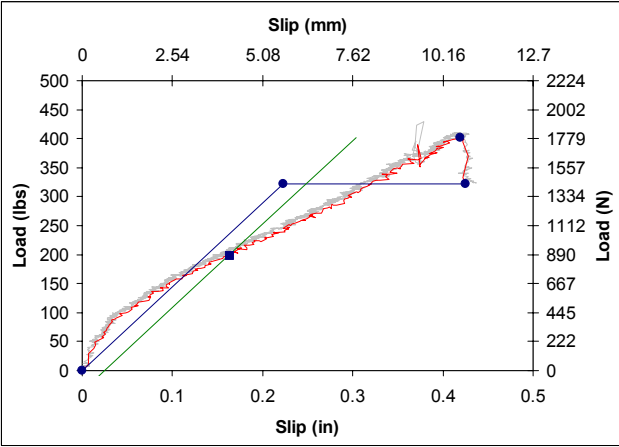


Figure A4.92: S-PA-3

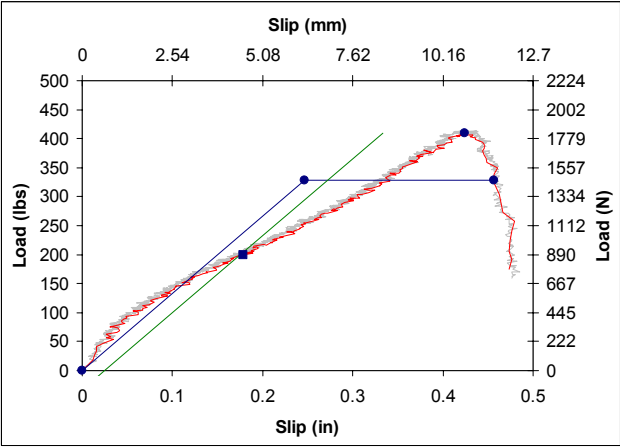


Figure A4.93: S-PA-4

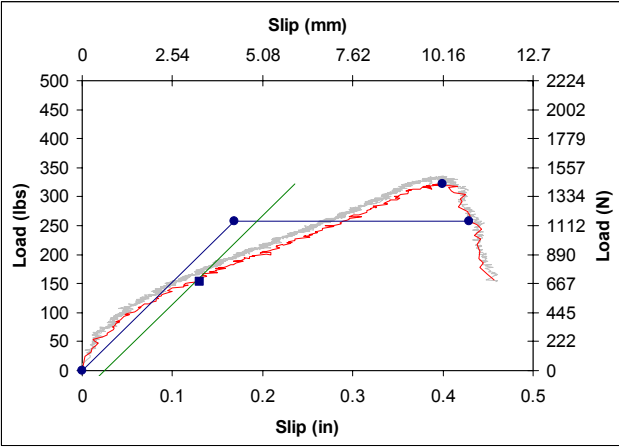


Figure A4.94: S-PA-5

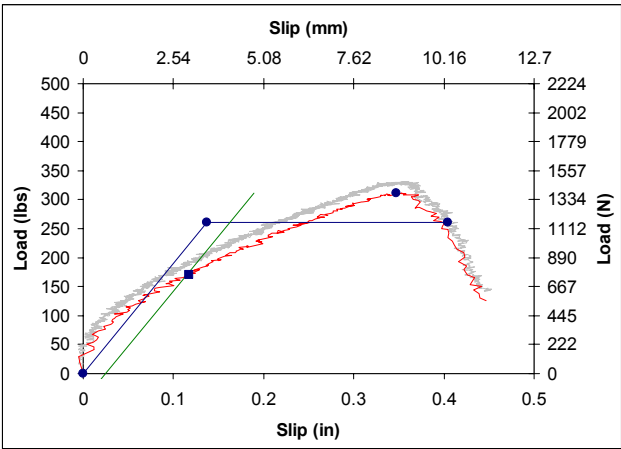


Figure A4.95: S-PA-6

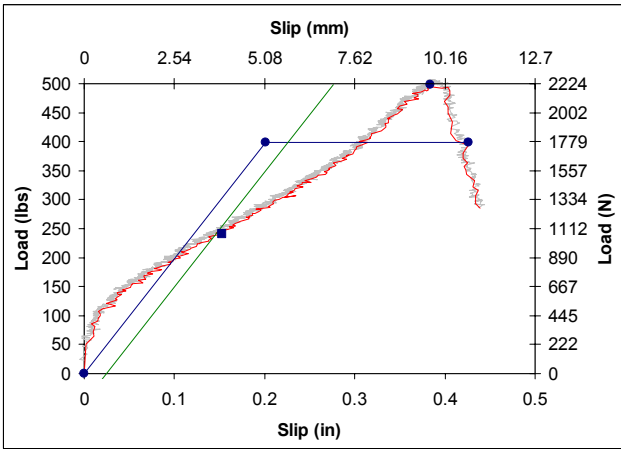


Figure A4.96: S-PA-7

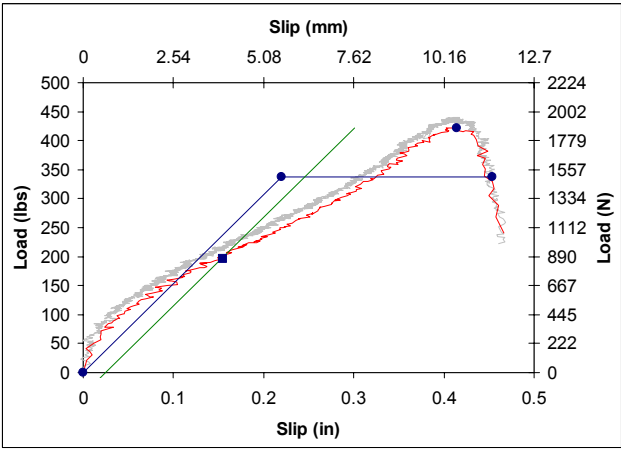


Figure A4.97: S-PA-8

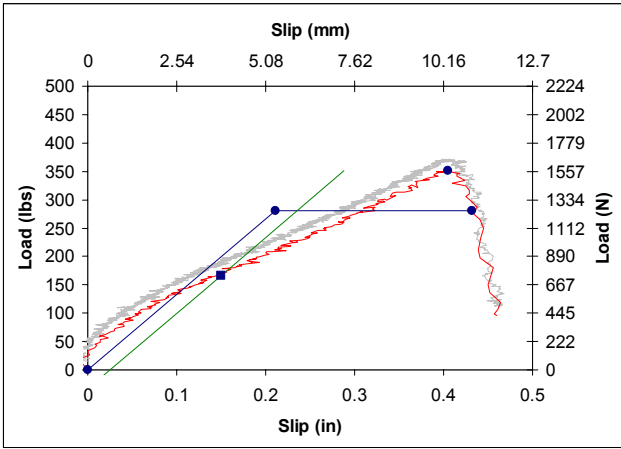


Figure A4.98: S-PA-9

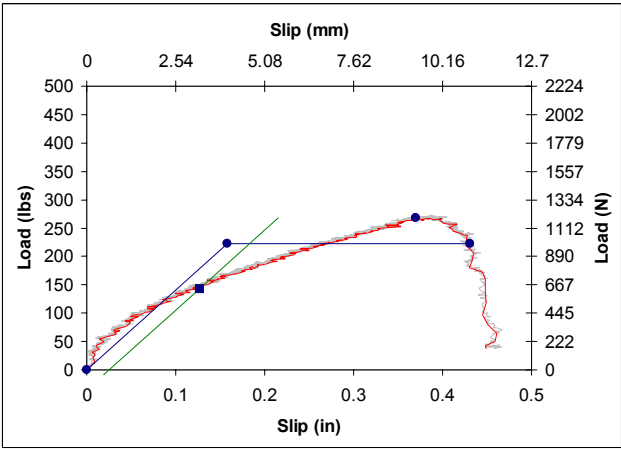


Figure A4.99: S-PA-10

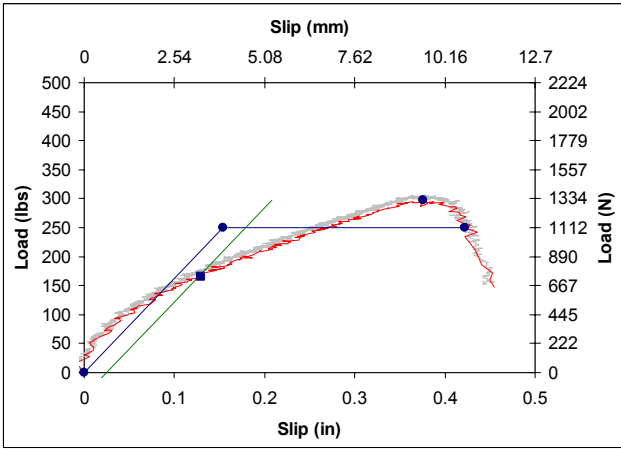


Figure A4.100: S-PA-11

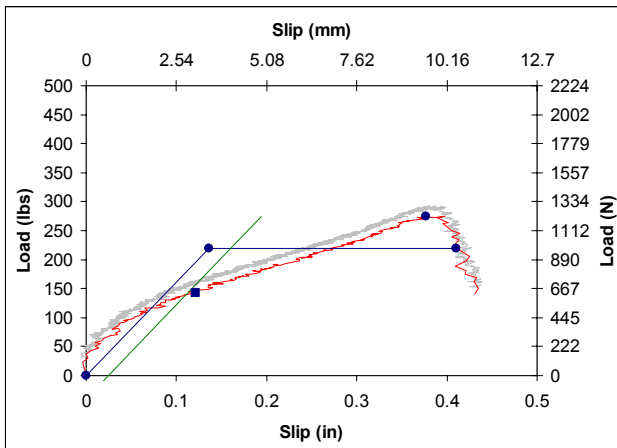


Figure A4.101: S-PA-12

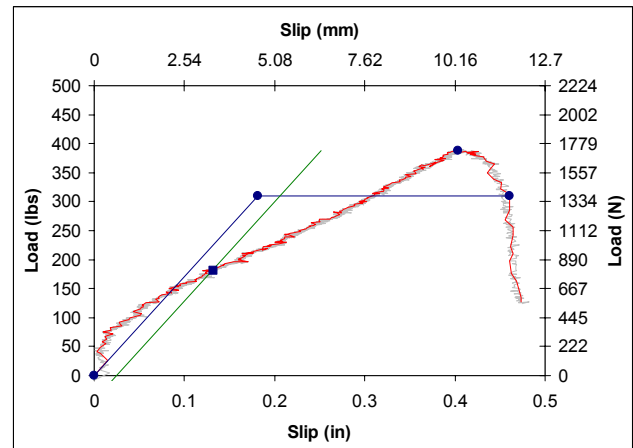


Figure A4.102: S-PA-13

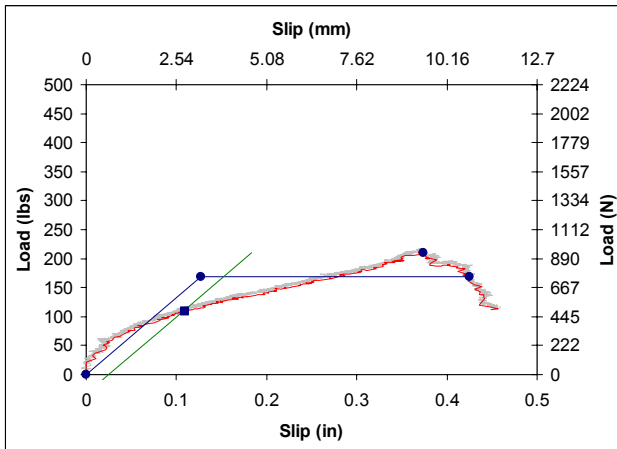


Figure A4.103: S-PA-14

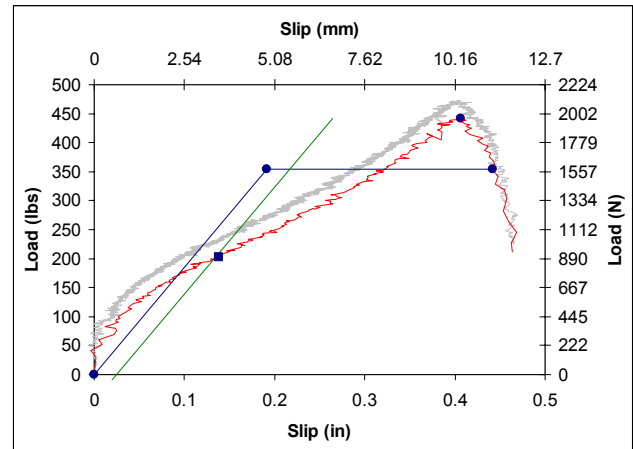


Figure A4.104: S-PA-15

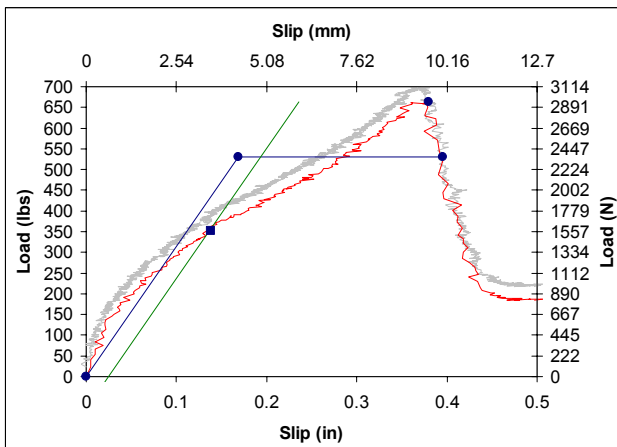


Figure A4.105: S-PAN-1

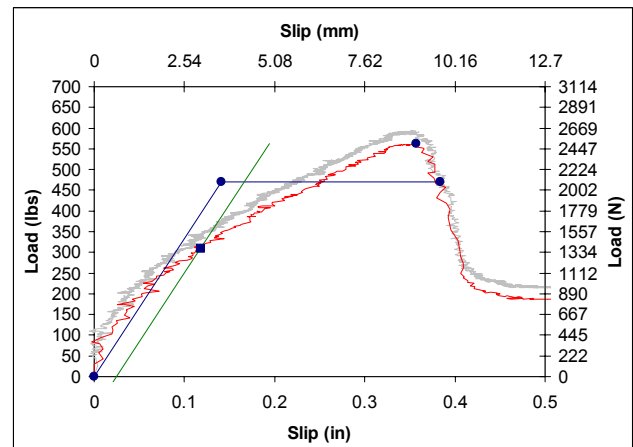


Figure A4.106: S-PAN-2

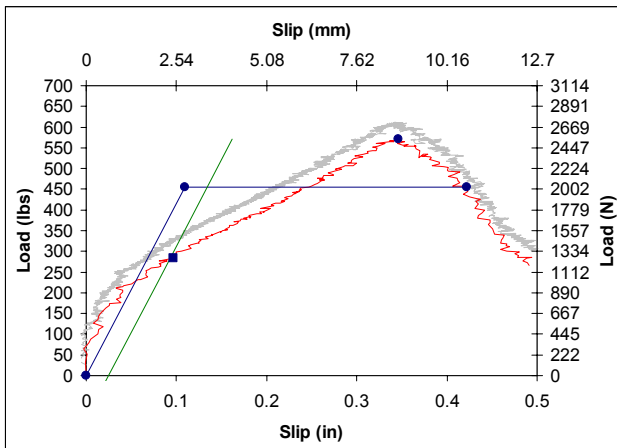


Figure A4.107: S-PAN-3

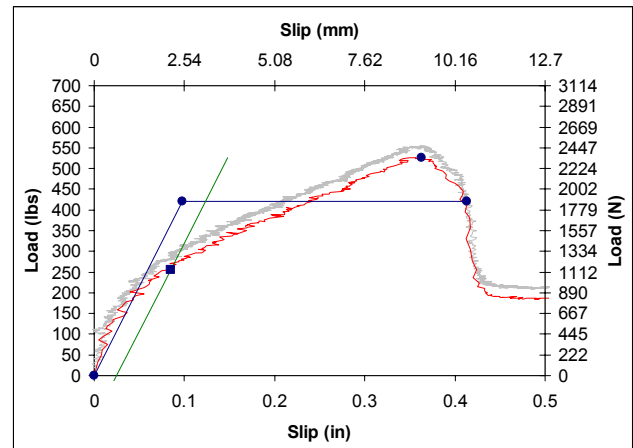


Figure A4.108: S-PAN-4

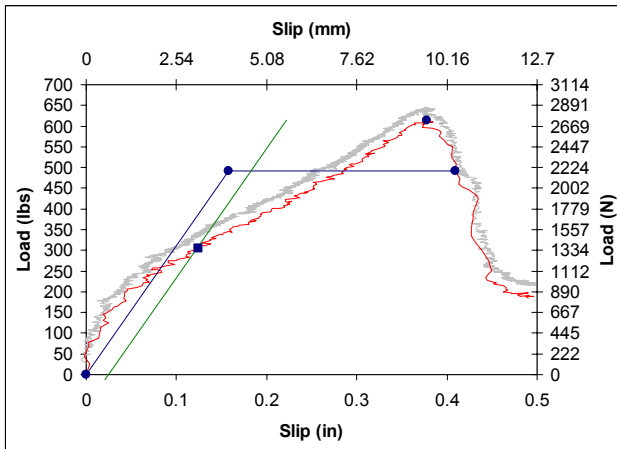


Figure A4.109: S-PAN-5

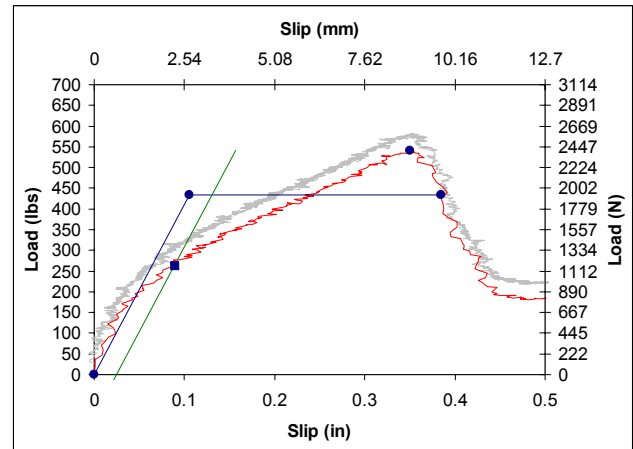


Figure A4.110: S-PAN-6

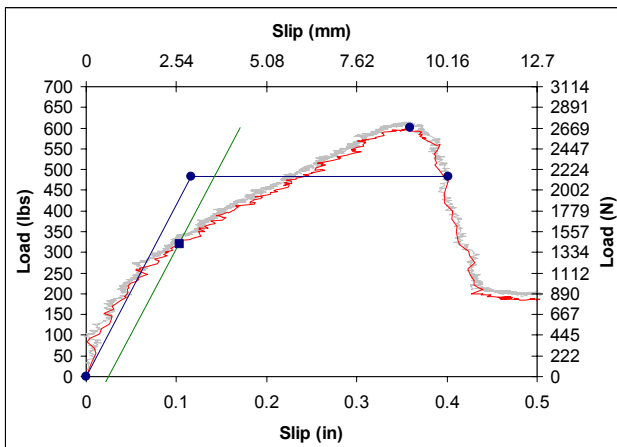


Figure A4.111: S-PAN-7

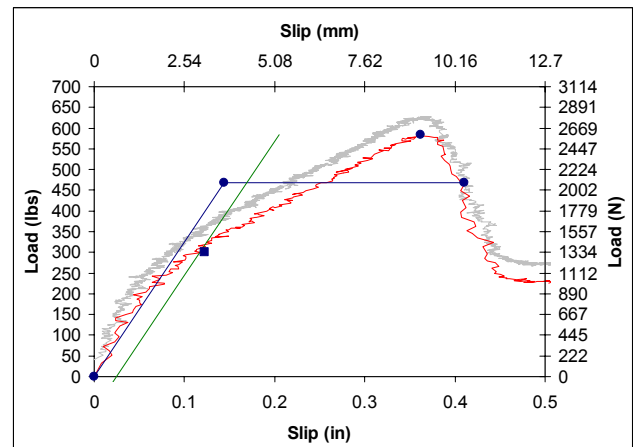


Figure A4.112: S-PAN-8

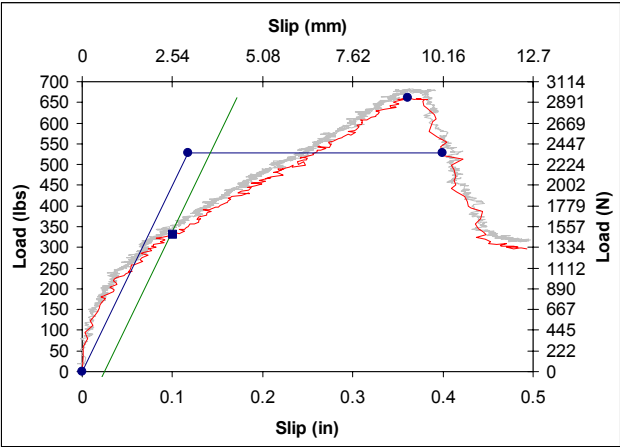


Figure A4.113: S-PAN-9

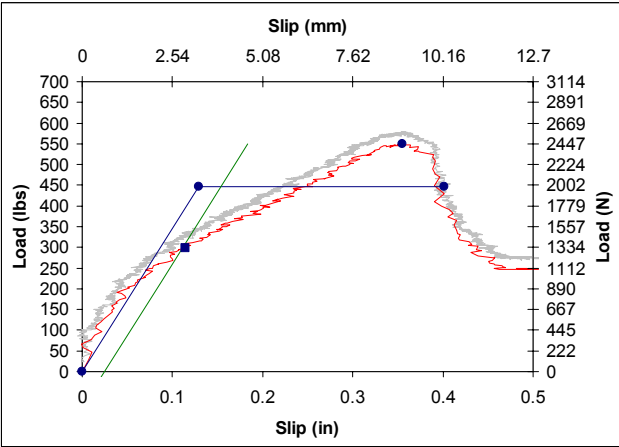


Figure A4.114: S-PAN-10

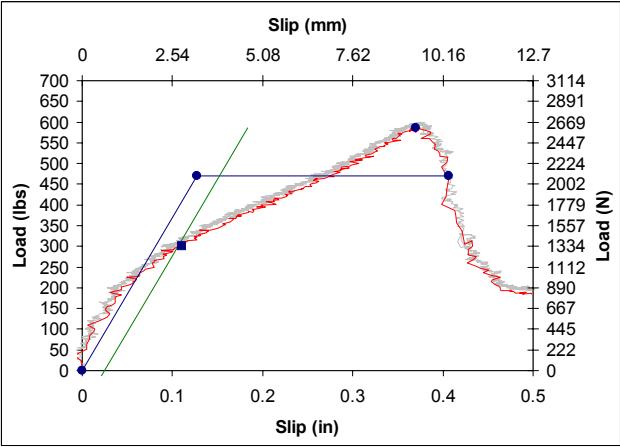


Figure A4.115: S-PAN-12

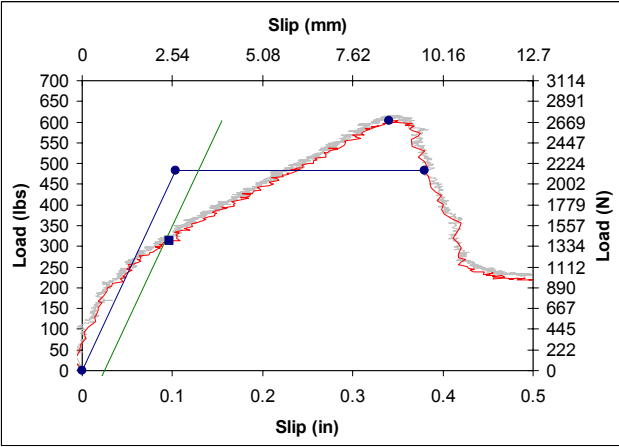


Figure A4.116: S-PAN-13

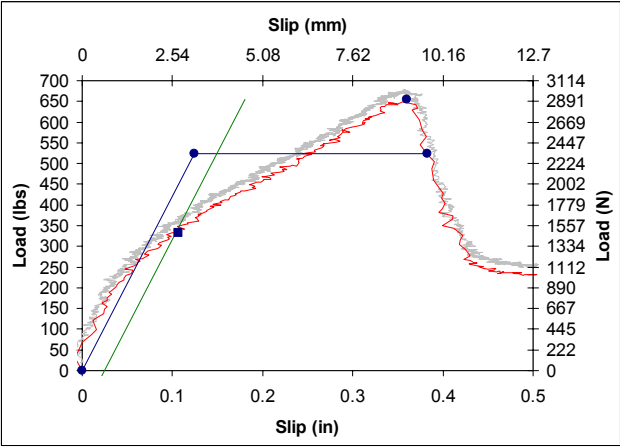


Figure A4.117: S-PAN-14

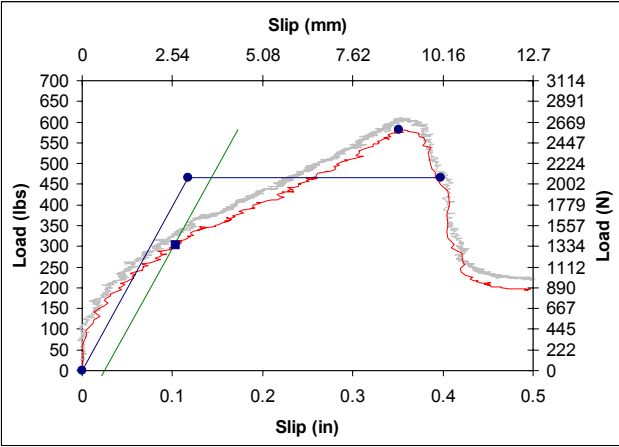


Figure A4.118: S-PAN-15

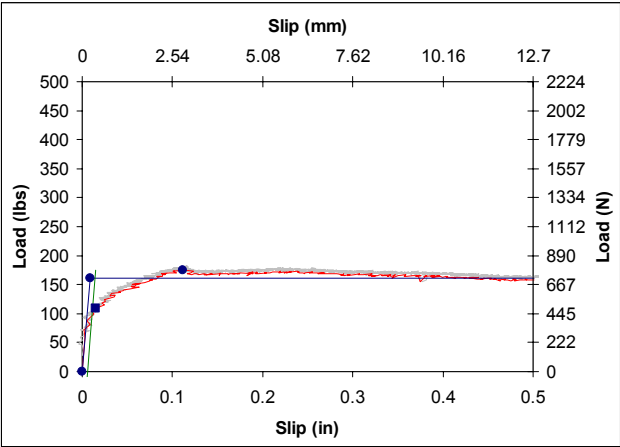


Figure A4.119: S-PN-1

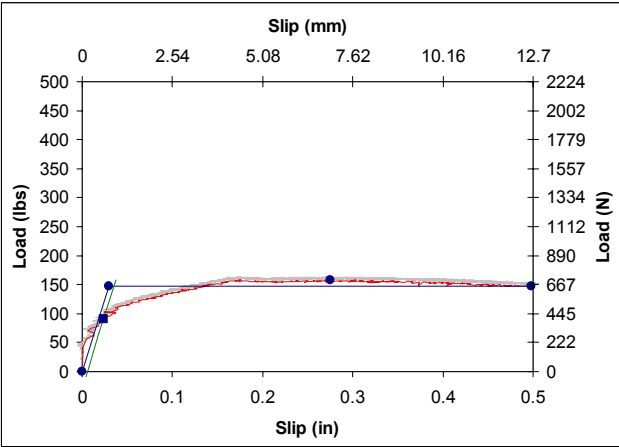


Figure A4.120: S-PN-2

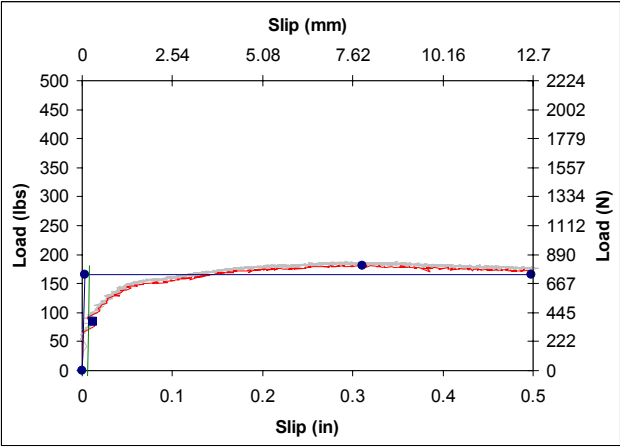


Figure A4.121: S-PN-3

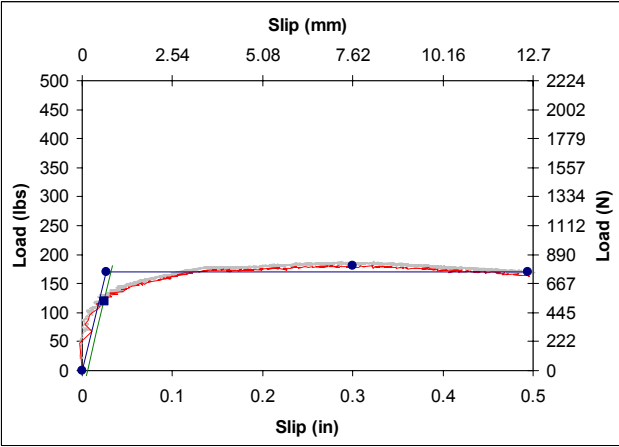


Figure A4.122: S-PN-4

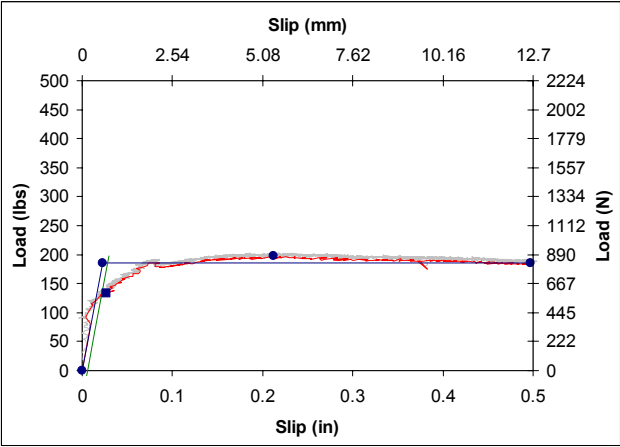


Figure A4.123: S-PN-5

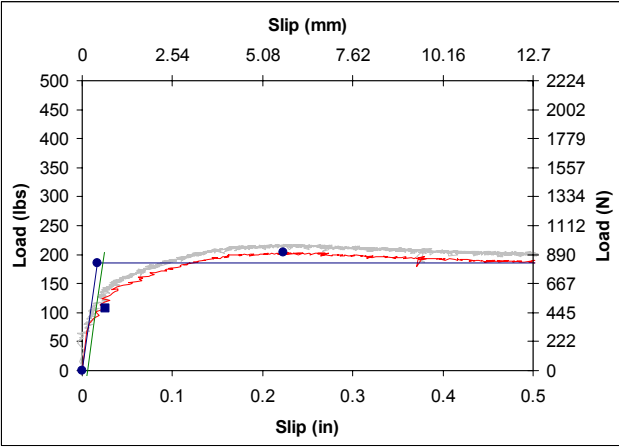


Figure A4.124: S-PN-6

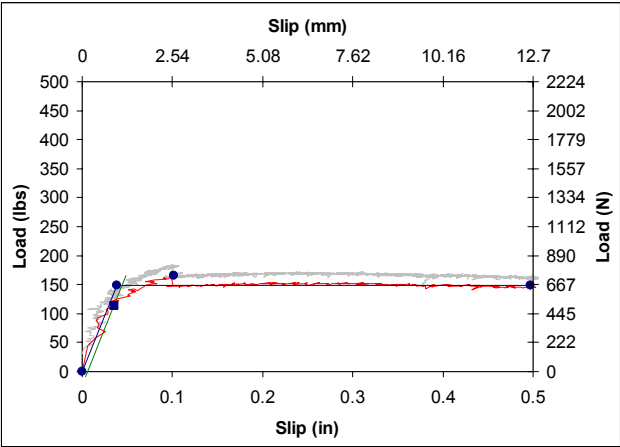


Figure A4.125: S-PN-7

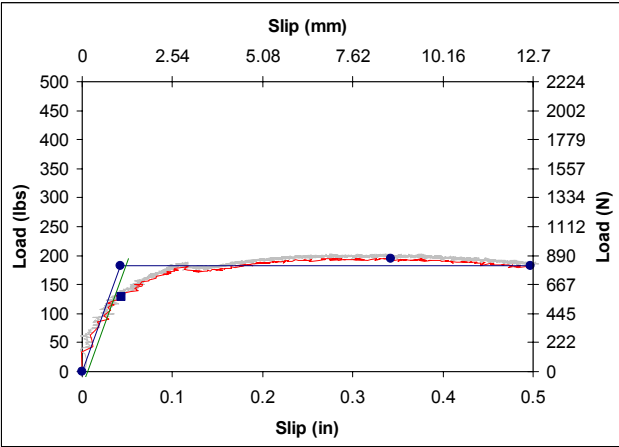


Figure A4.126: S-PN-8

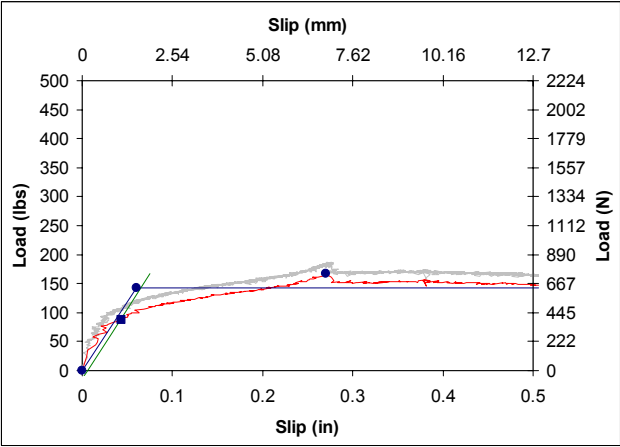


Figure A4.127: S-PN-9

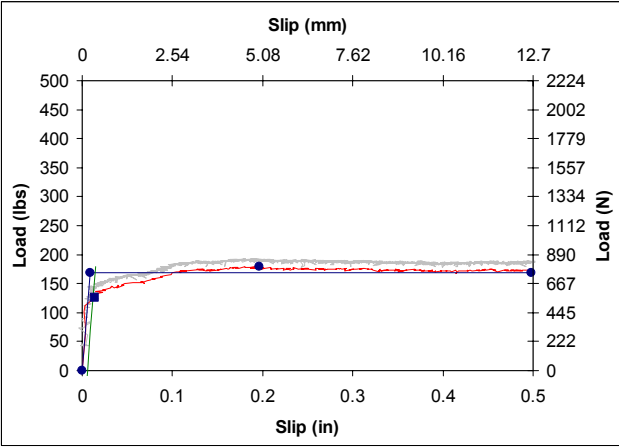


Figure A4.128: S-PN-10

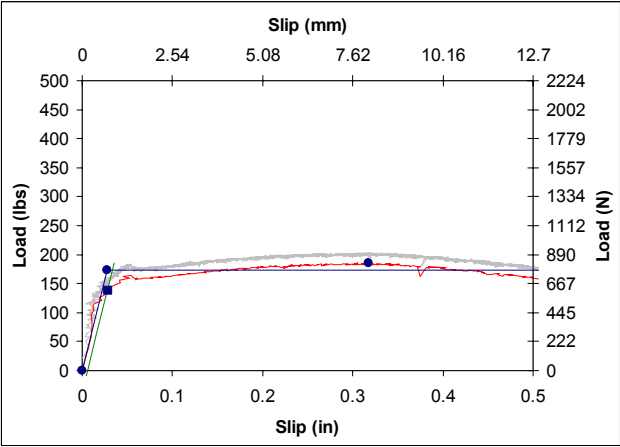


Figure A4.129: S-PN-11

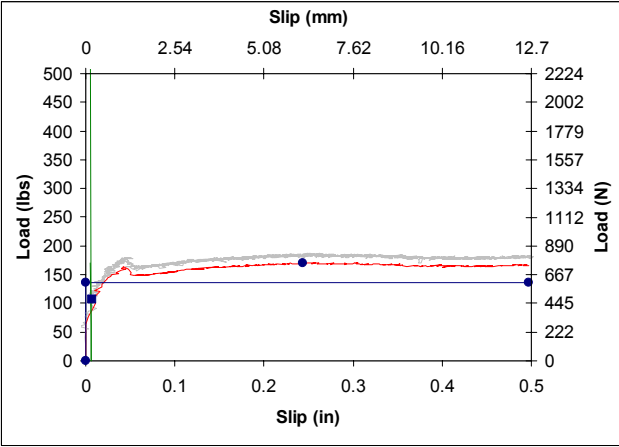


Figure A4.130: S-PN-12

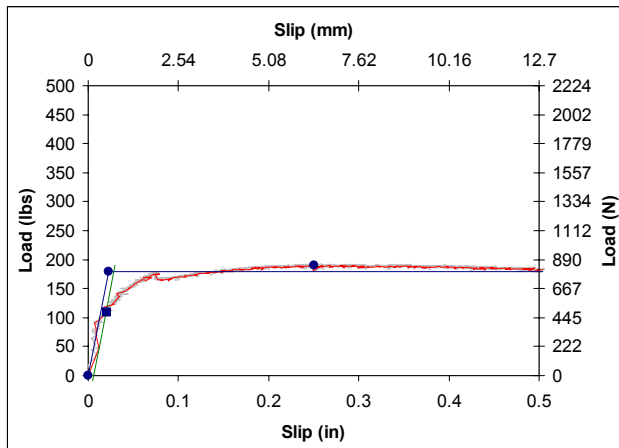


Figure A4.131: S-PN-13

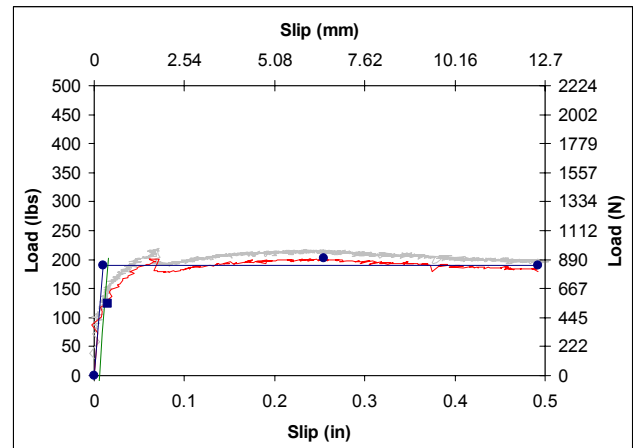


Figure A4.132: S-PN-14

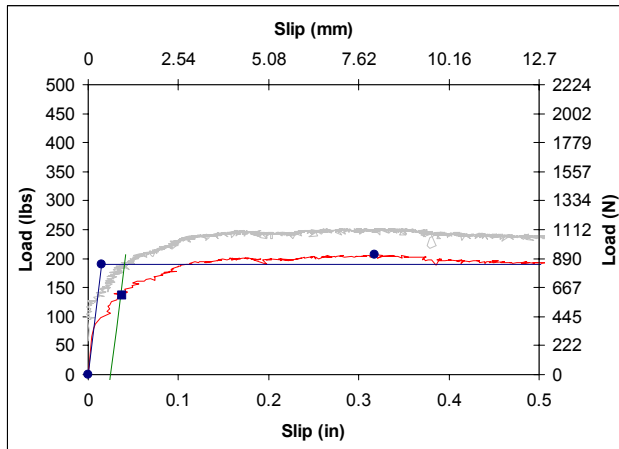


Figure A4.133: S-PN-15

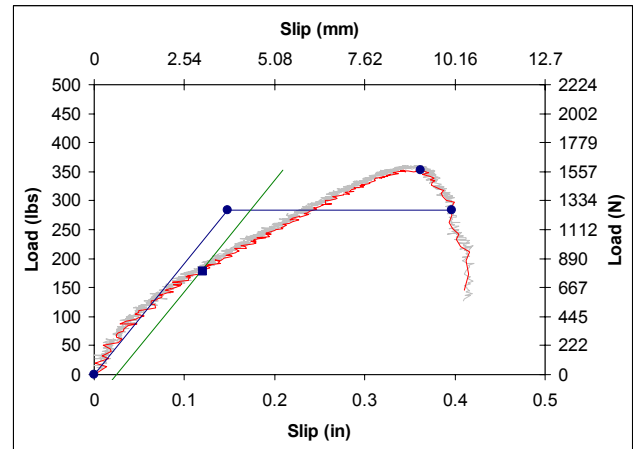


Figure A4.134: S-PMT1-1

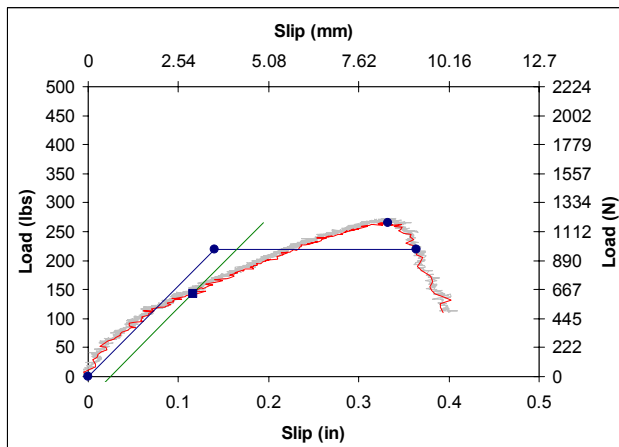


Figure A4.135: S-PMT1-2

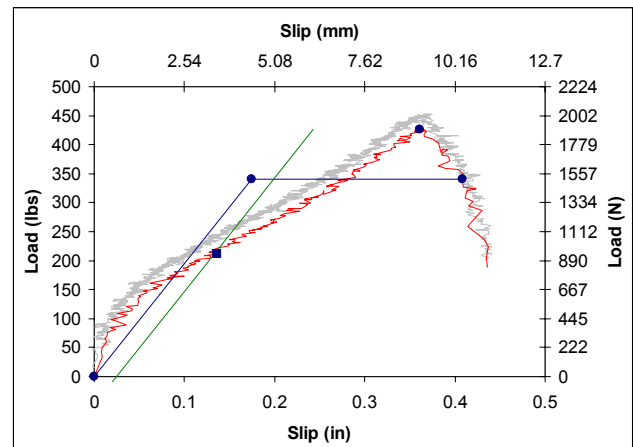


Figure A4.136: S-PMT1-3

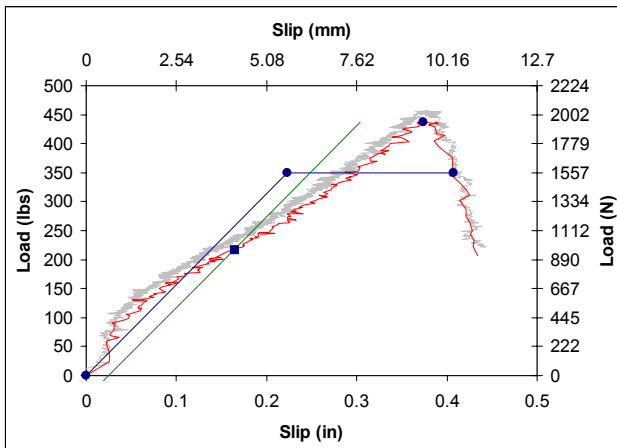


Figure A4.137: S-PMT1-4

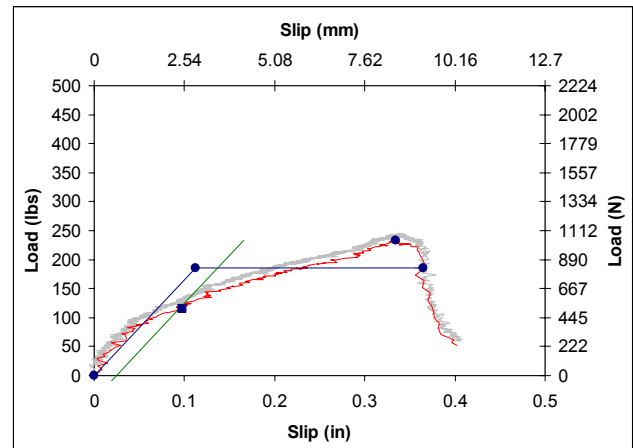


Figure A4.138: S-PMT1-5

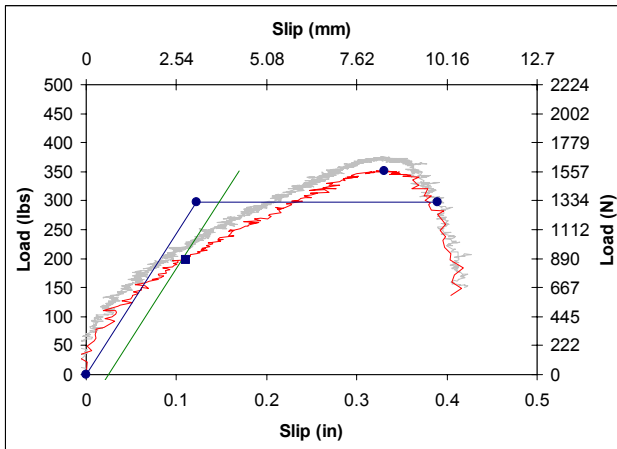


Figure A4.139: S-PMT1-6

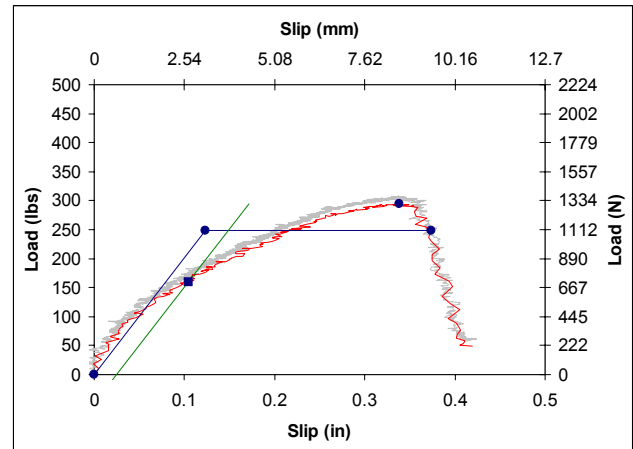


Figure A4.140: S-PMT1-7

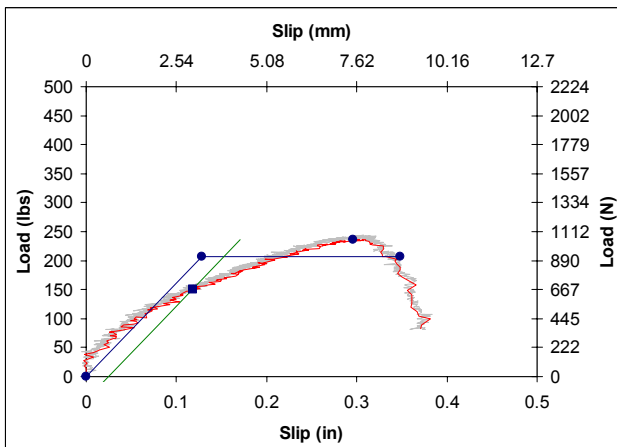


Figure A4.141: S-PMT1-8

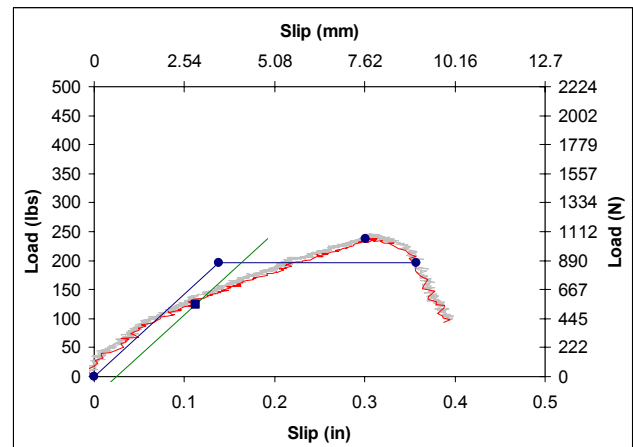


Figure A4.142: S-PMT1-9

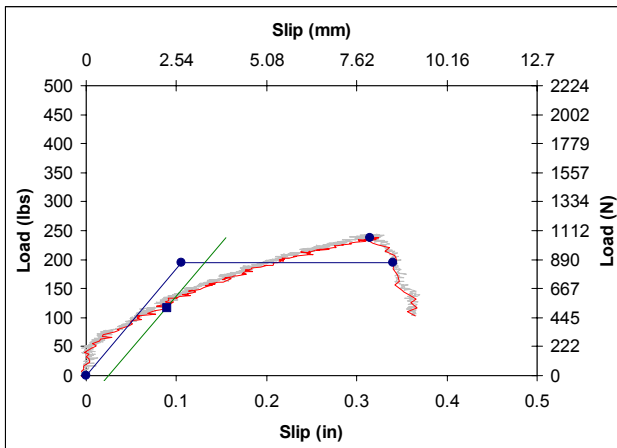


Figure A4.143: S-PMT1-10

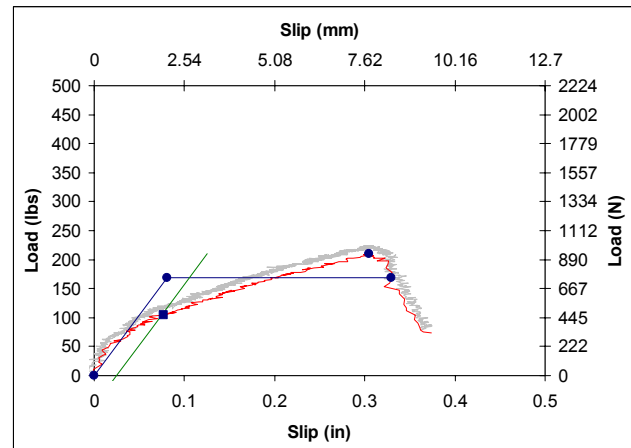


Figure A4.144: S-PMT1-11

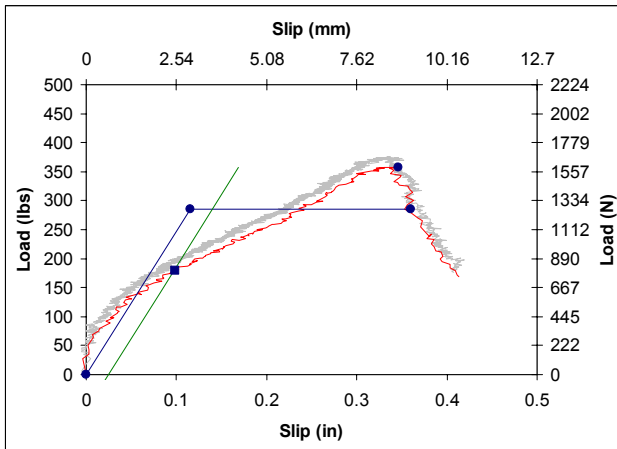


Figure A4.145: S-PMT1-12

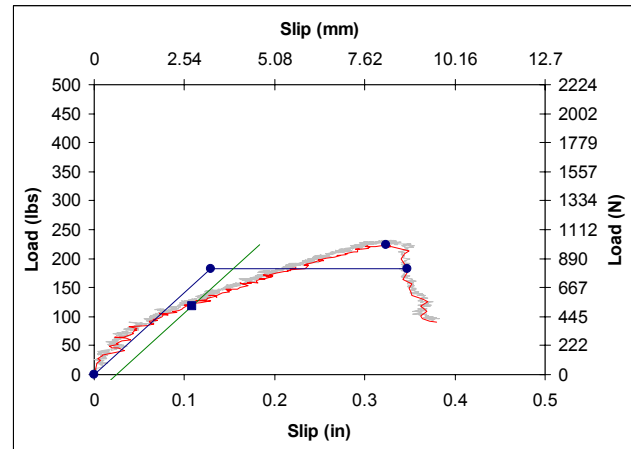


Figure A4.146: S-PMT1-13

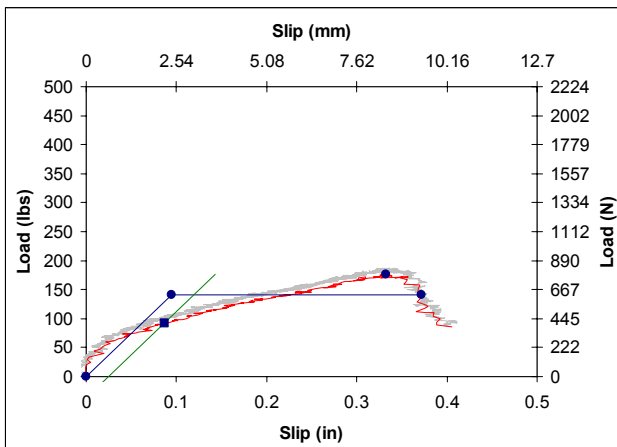


Figure A4.147: S-PMT1-14

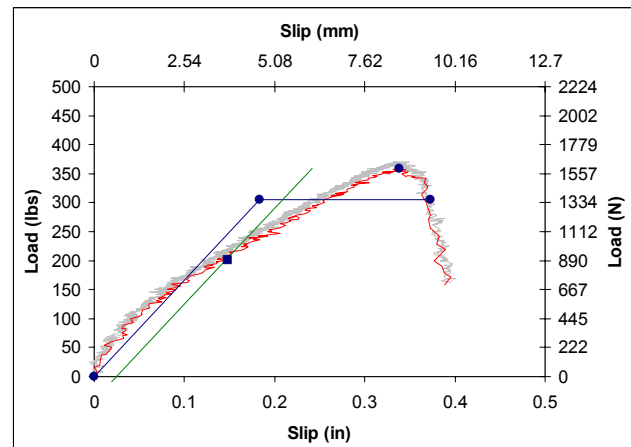


Figure A4.148: S-PMT1-15

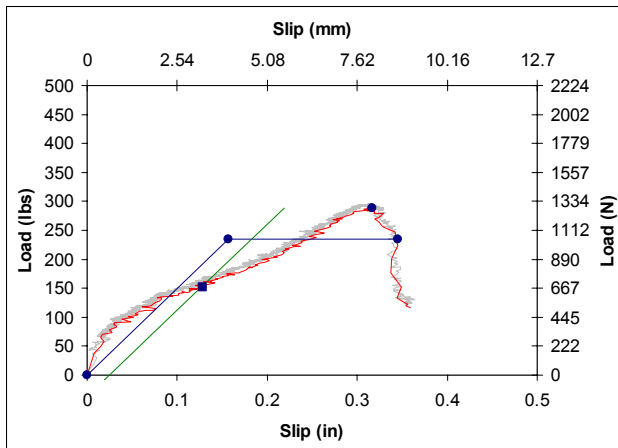


Figure A4.149: S-PMT2-1

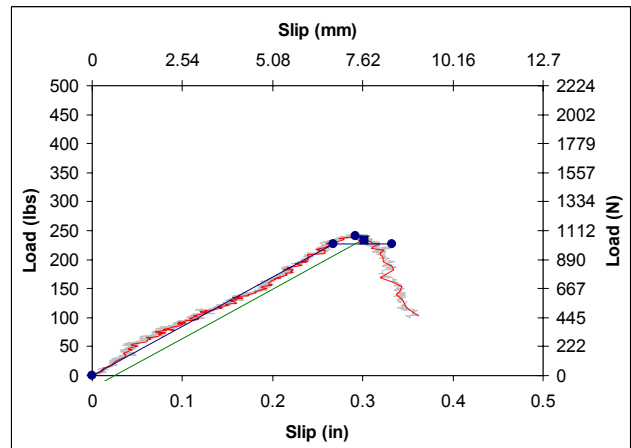


Figure A4.150: S-PMT2-2

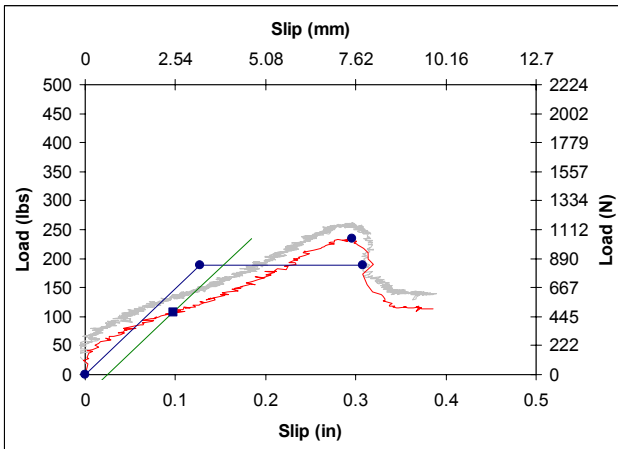


Figure A4.151: S-PMT2-3

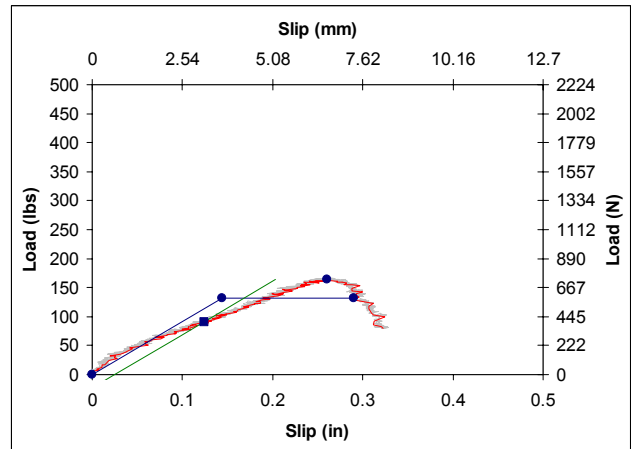


Figure A4.152: S-PMT2-4

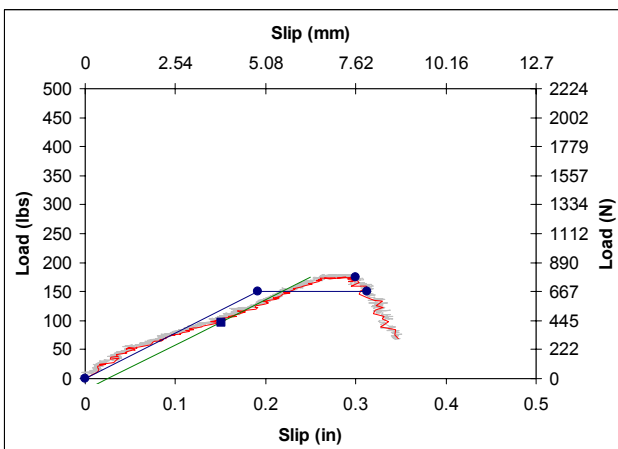


Figure A4.153: S-PMT2-5

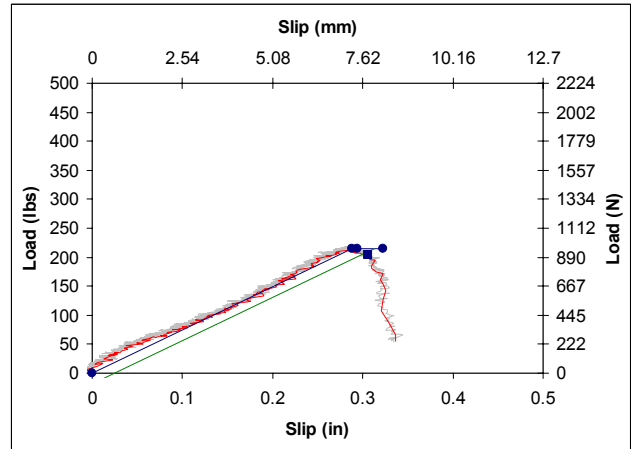


Figure A4.154: S-PMT2-6

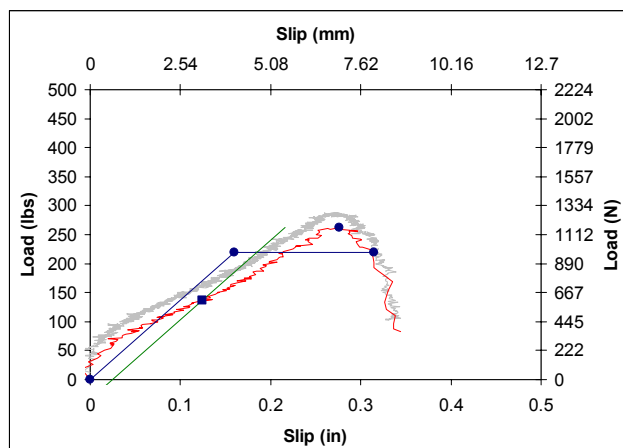


Figure A4.155: S-PMT2-7

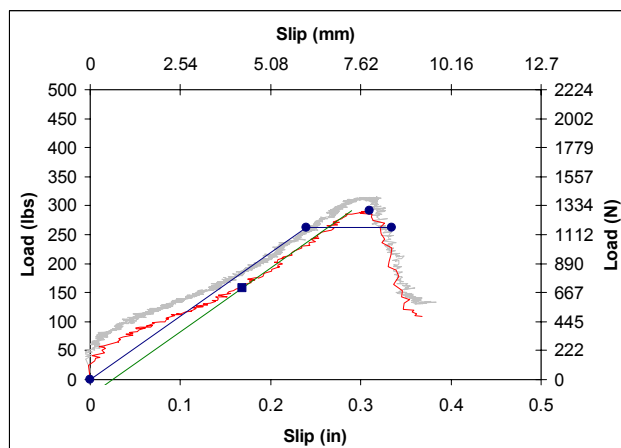


Figure A4.156: S-PMT2-8

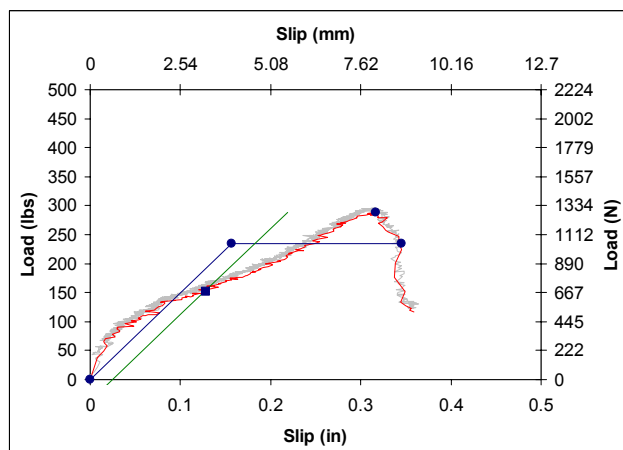


Figure A4.157: S-PMT2-9

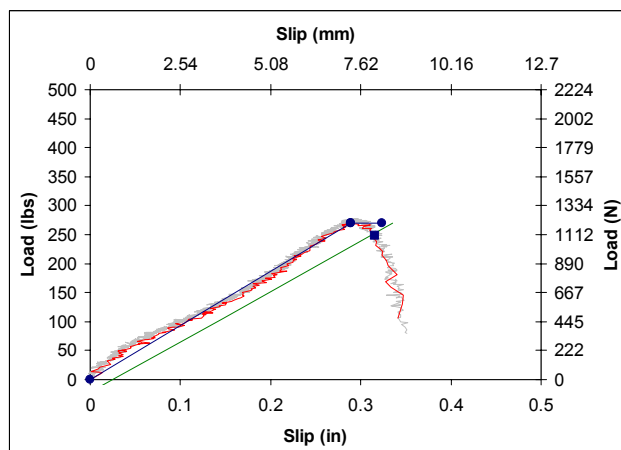


Figure A4.158: S-PMT2-10

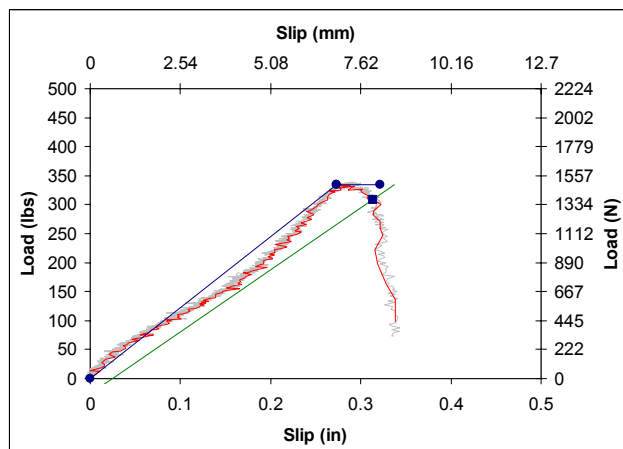


Figure A4.159: S-PMT2-11

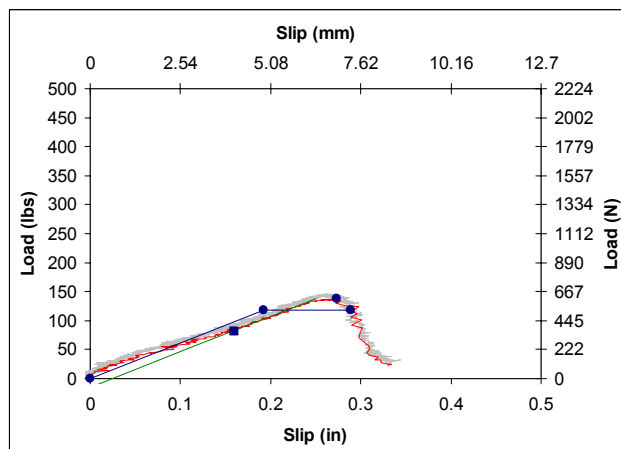


Figure A4.160: S-PMT2-12

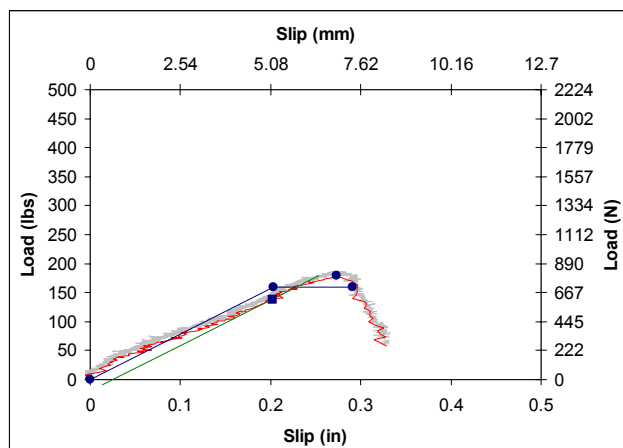


Figure A4.161: S-PMT2-13

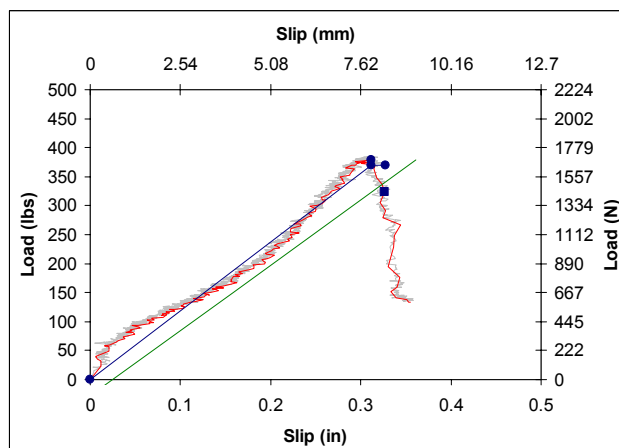


Figure A4.162: S-PMT2-14

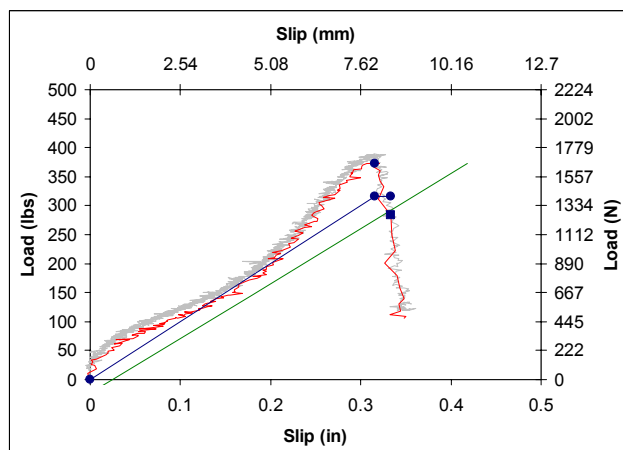


Figure A4.163: S-PMT2-15

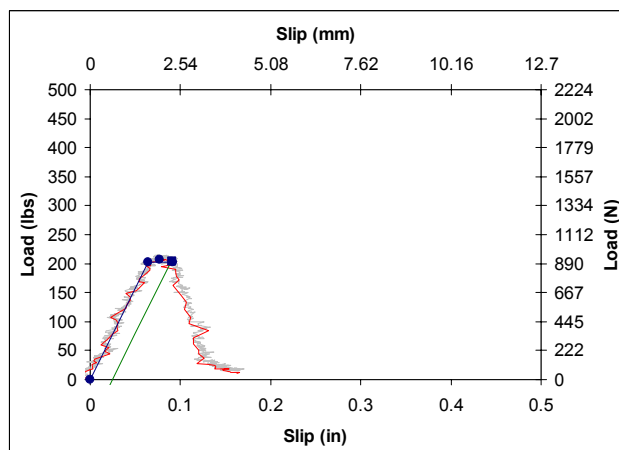


Figure A4.164: S-PMT3-1

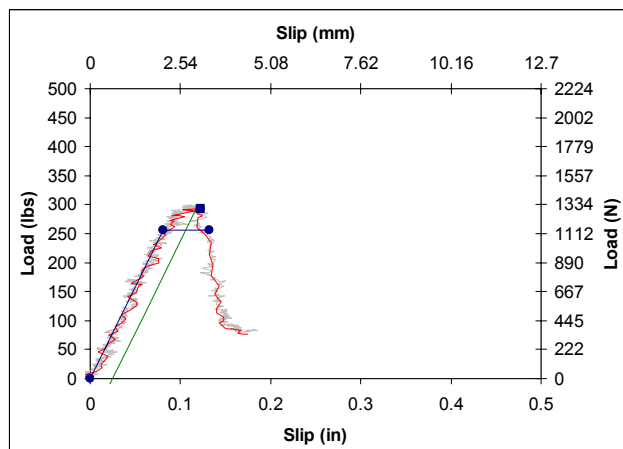


Figure A4.165: S-PMT3-2

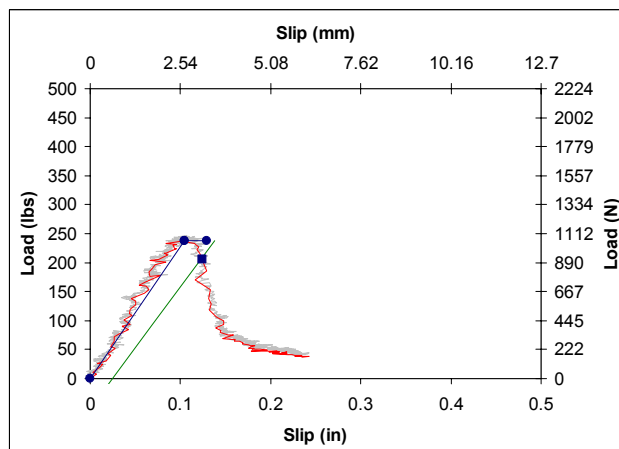


Figure A4.166: S-PMT3-3

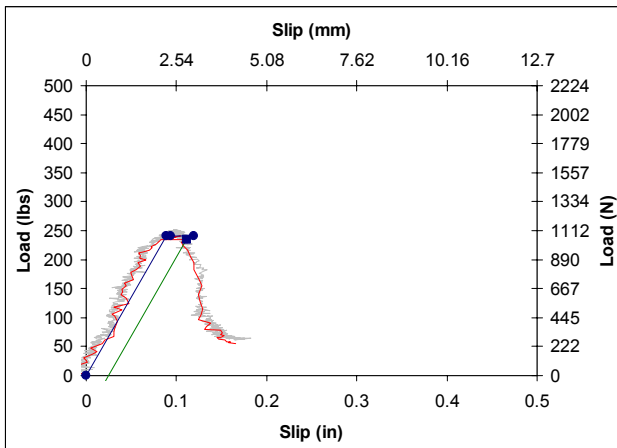


Figure A4.167: S-PMT3-4

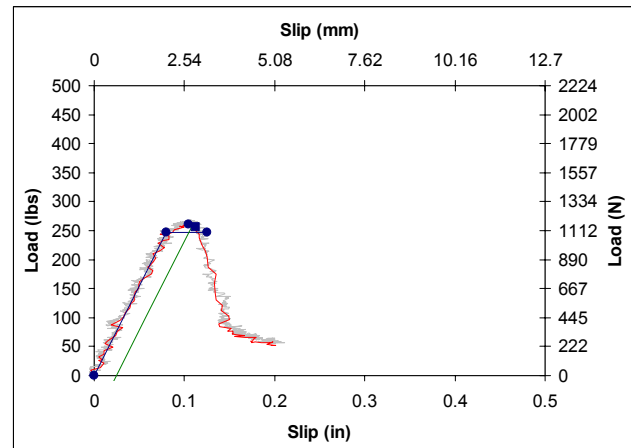


Figure A4.168: S-PMT3-5

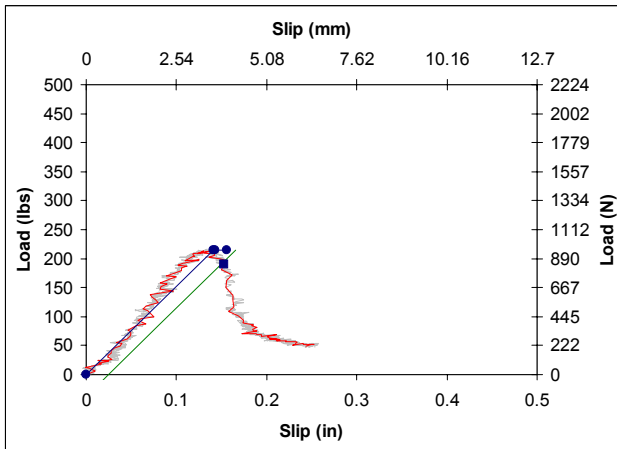


Figure A4.169: S-PMT3-6

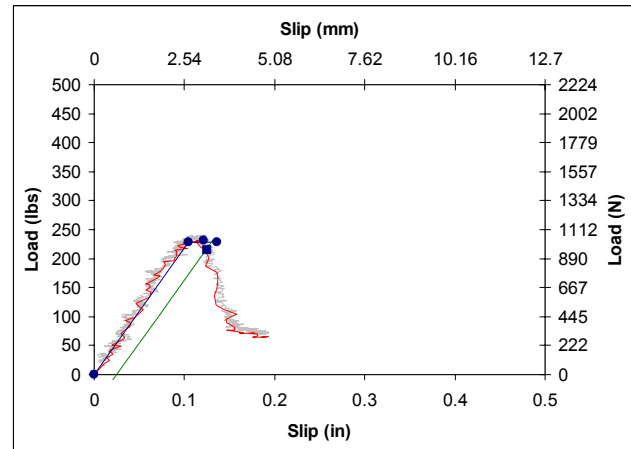


Figure A4.170: S-PMT3-7

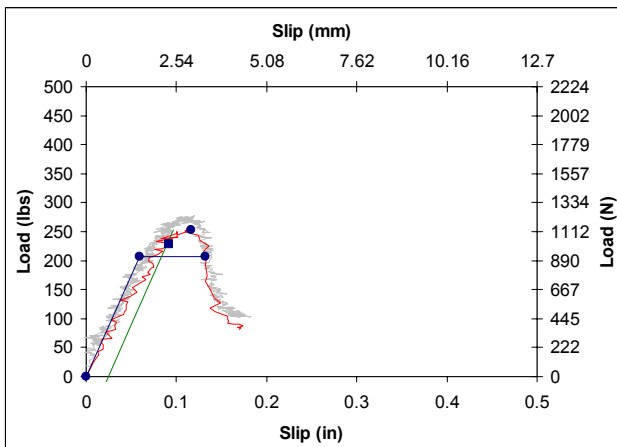


Figure A4.171: S-PMT3-8

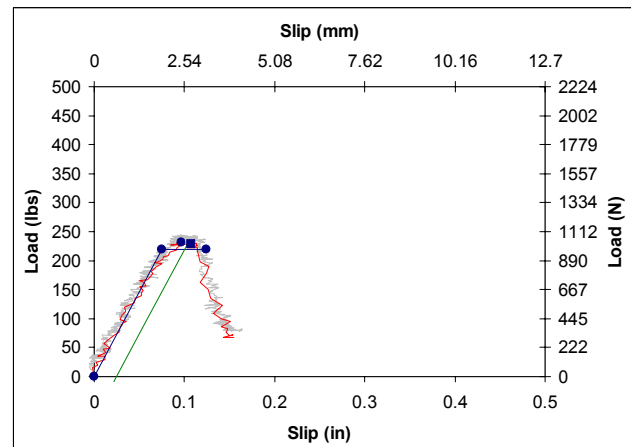


Figure A4.172: S-PMT3-9

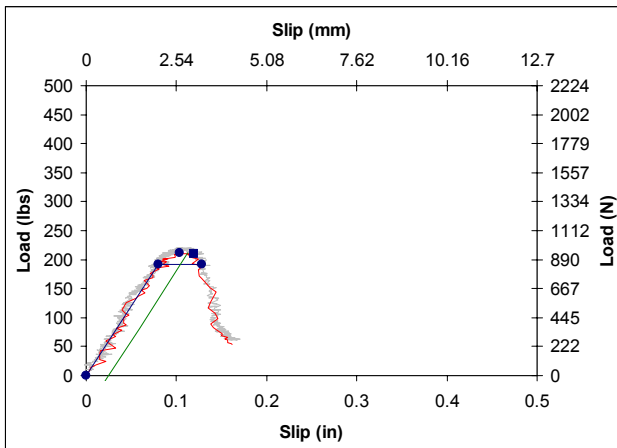


Figure A4.173: S-PMT3-10

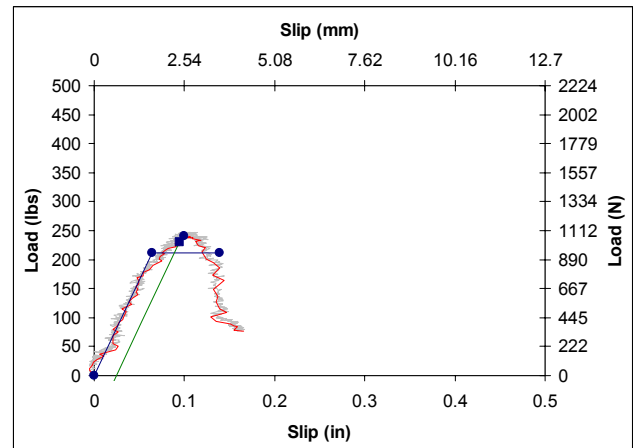


Figure A4.174: S-PMT3-11

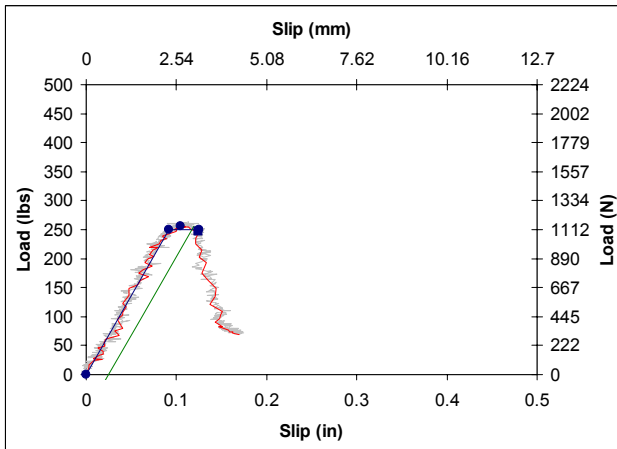


Figure A4.175: S-PMT3-12

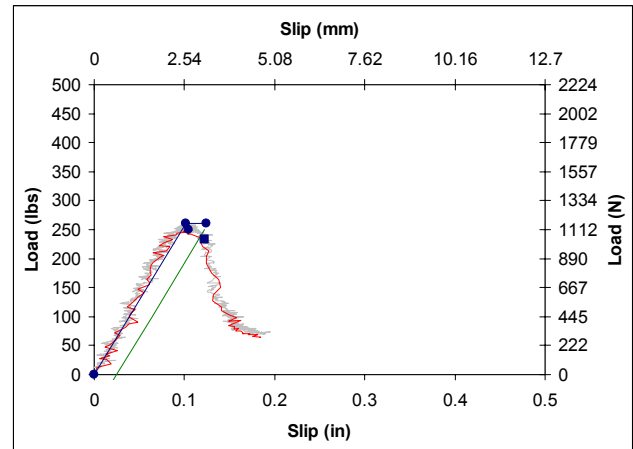


Figure A4.176: S-PMT3-13

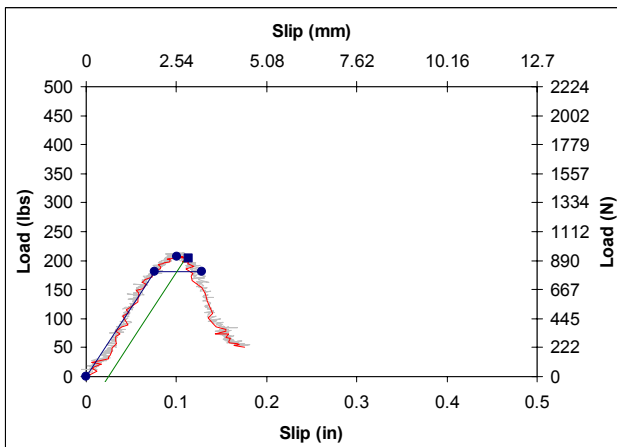


Figure A4.177: S-PMT3-14

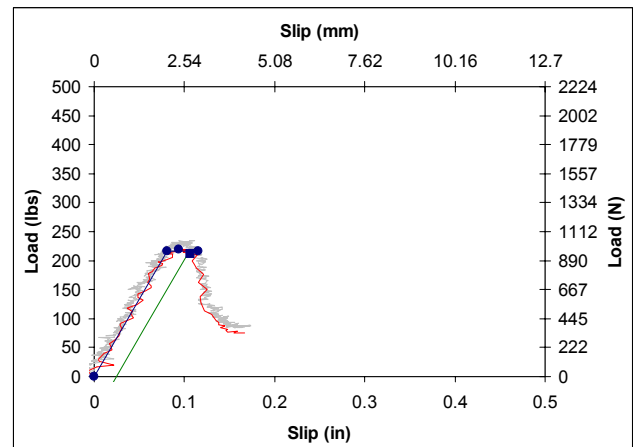


Figure A4.178: S-PMT3-15

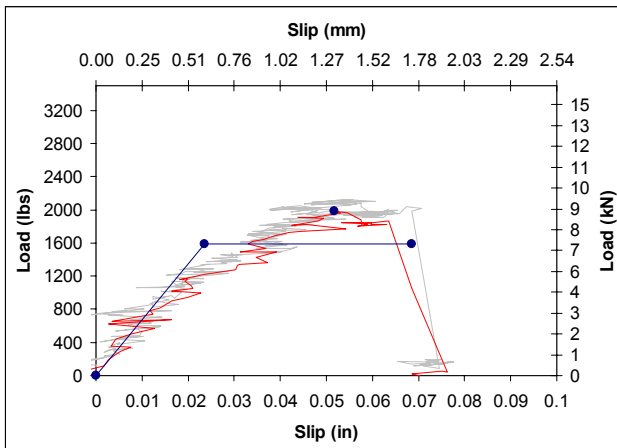


Figure A4.179: WG-O1

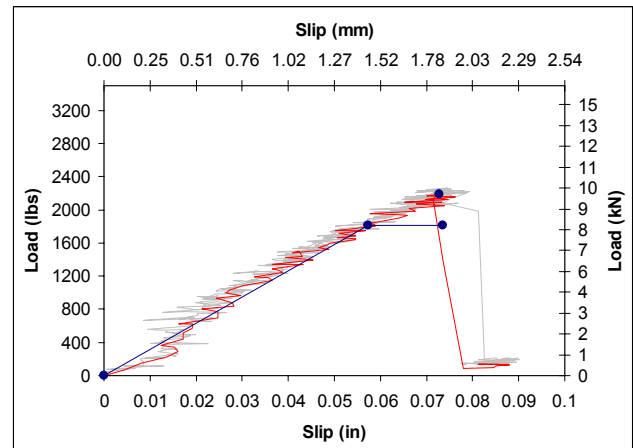


Figure A4.180: WG-O2

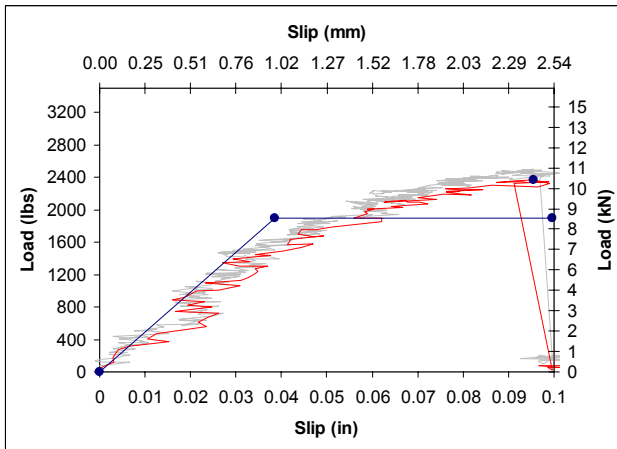


Figure A4.181: WG-P1

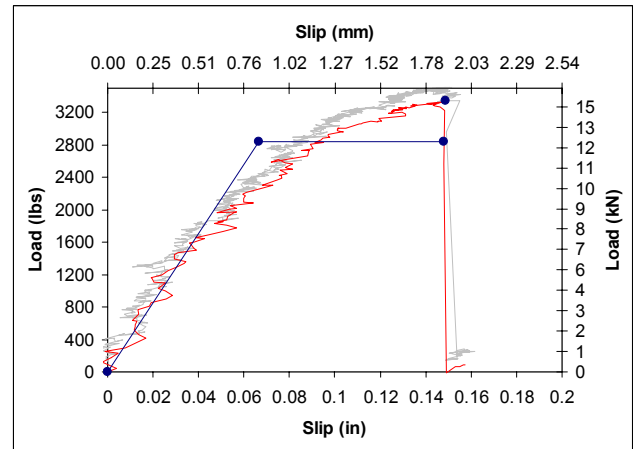


Figure A4.182: WG-P2

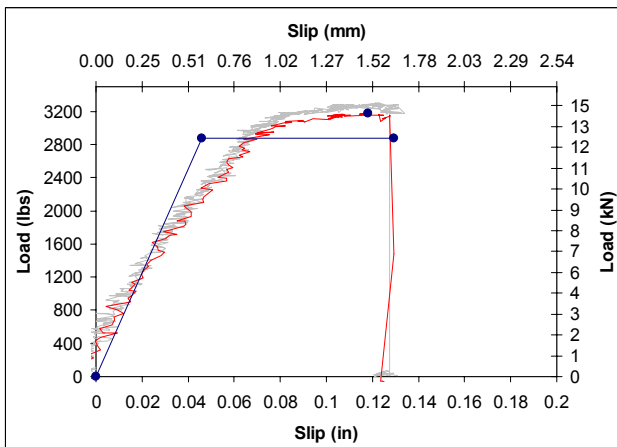


Figure A4.183: WG-P3

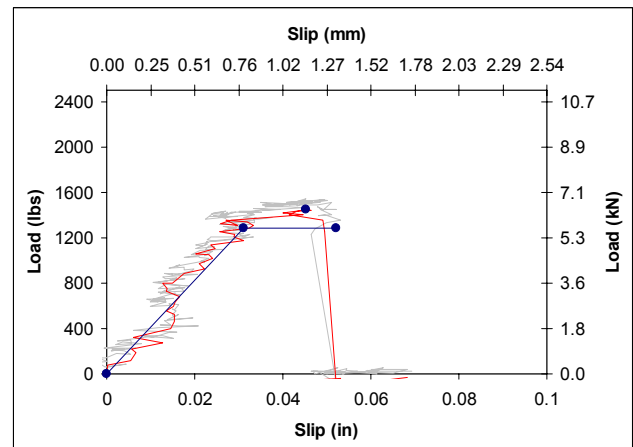


Figure A4.184: LN-O1

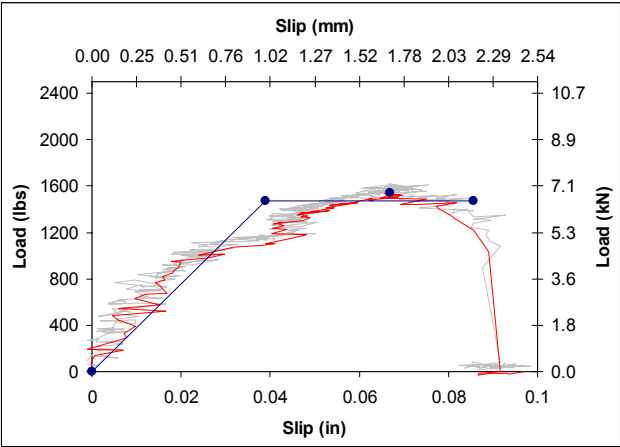


Figure A4.185: LN-O2

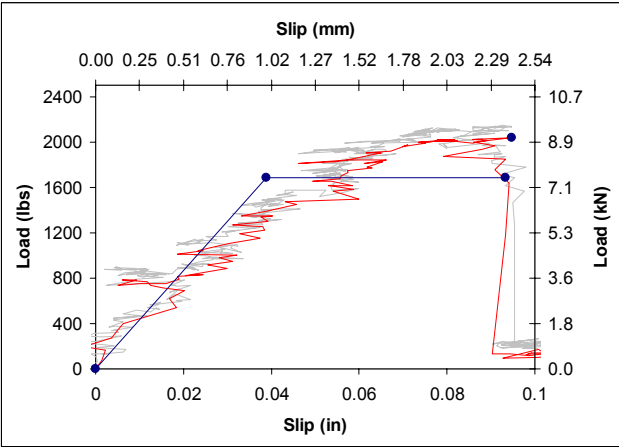


Figure A4.186: LN-P1

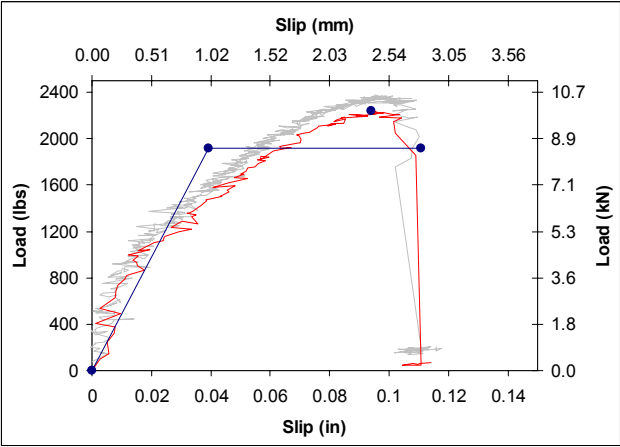


Figure A4.187: LN-P2

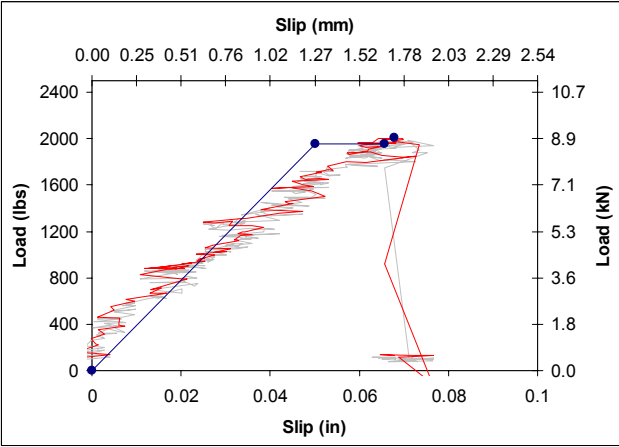


Figure A4.188: LN-P3