

Figure A-29: 4 Mixes @ 4% Voids & 0°C

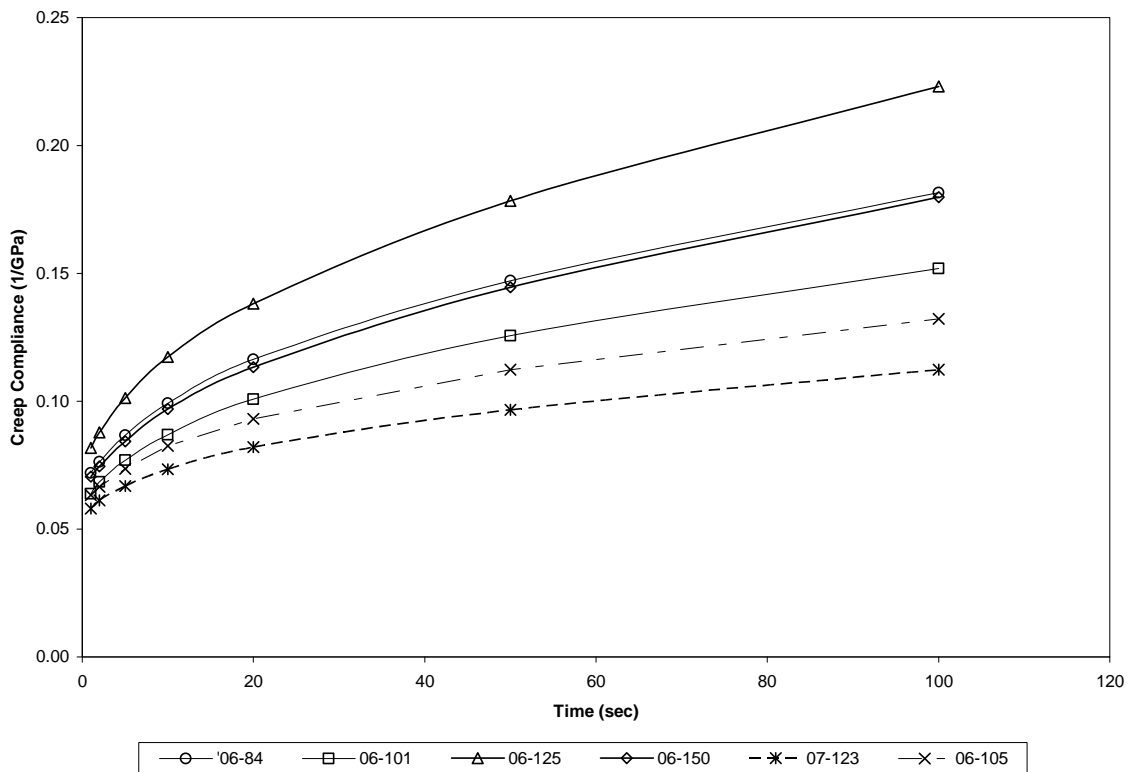


Figure A-30: 6 Mixes @ 6.5% Voids & 0°C

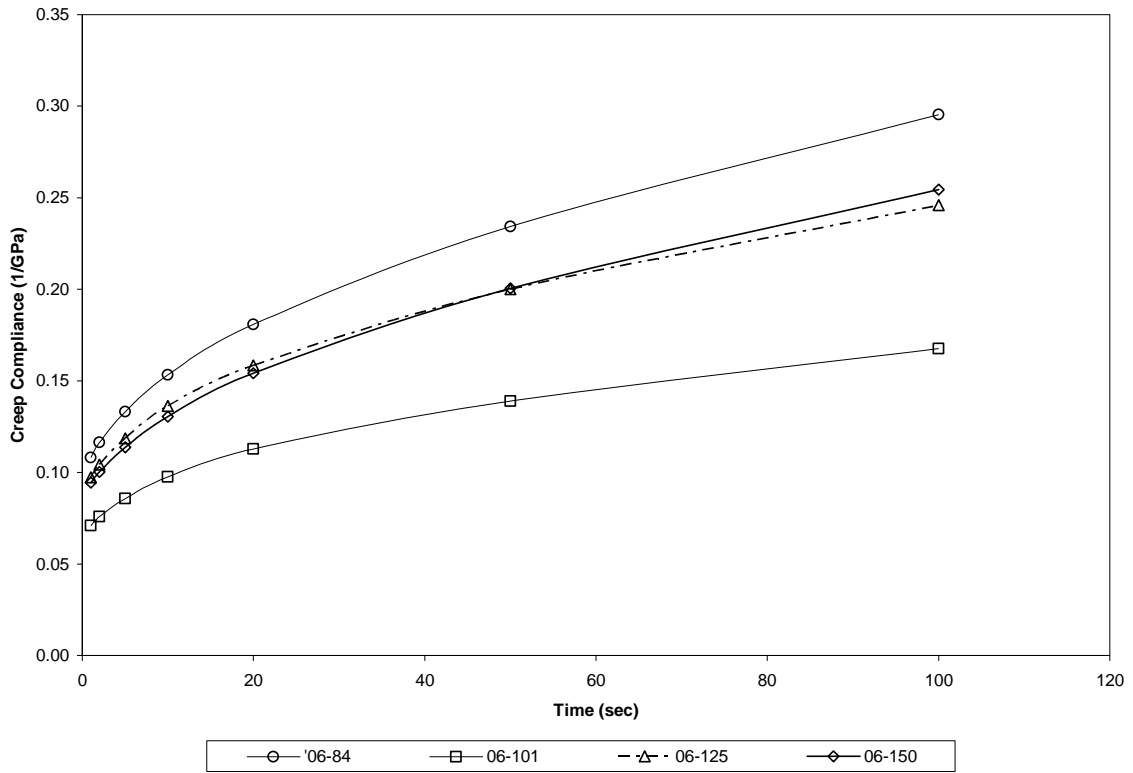


Figure A-31: 4 Mixes @ 9% Voids & 0°C

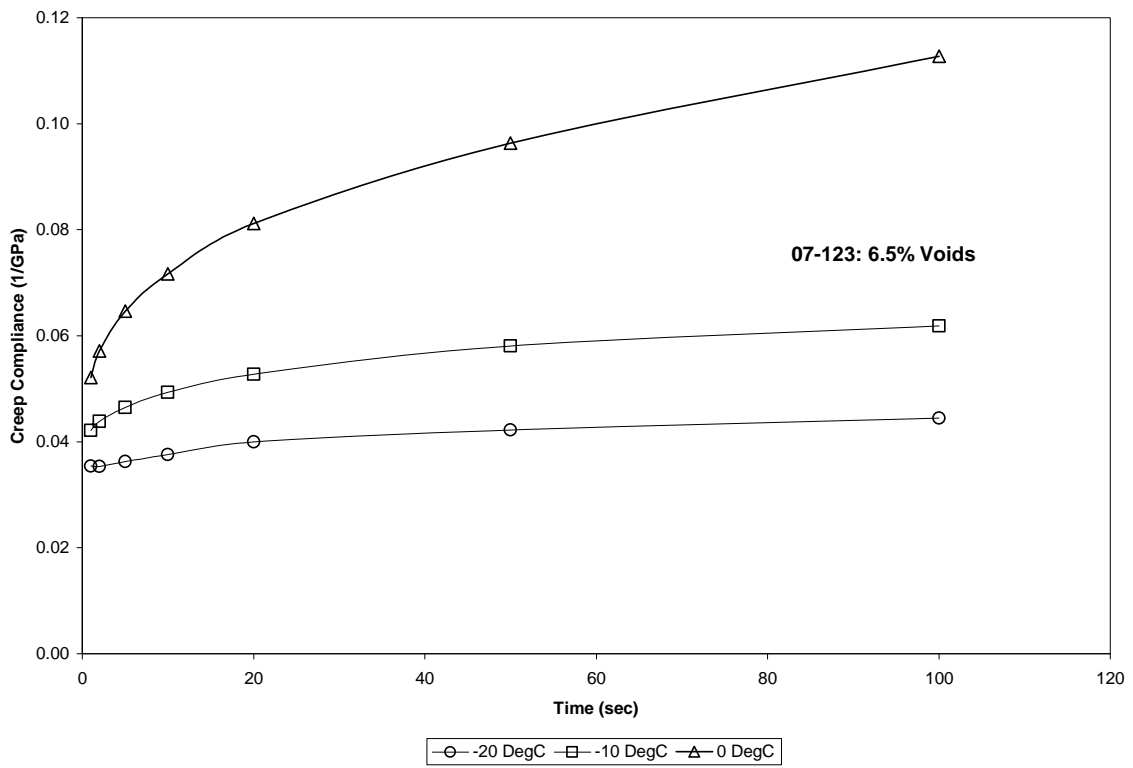


Figure A-32: 07-123 Using Equivalent Area Method

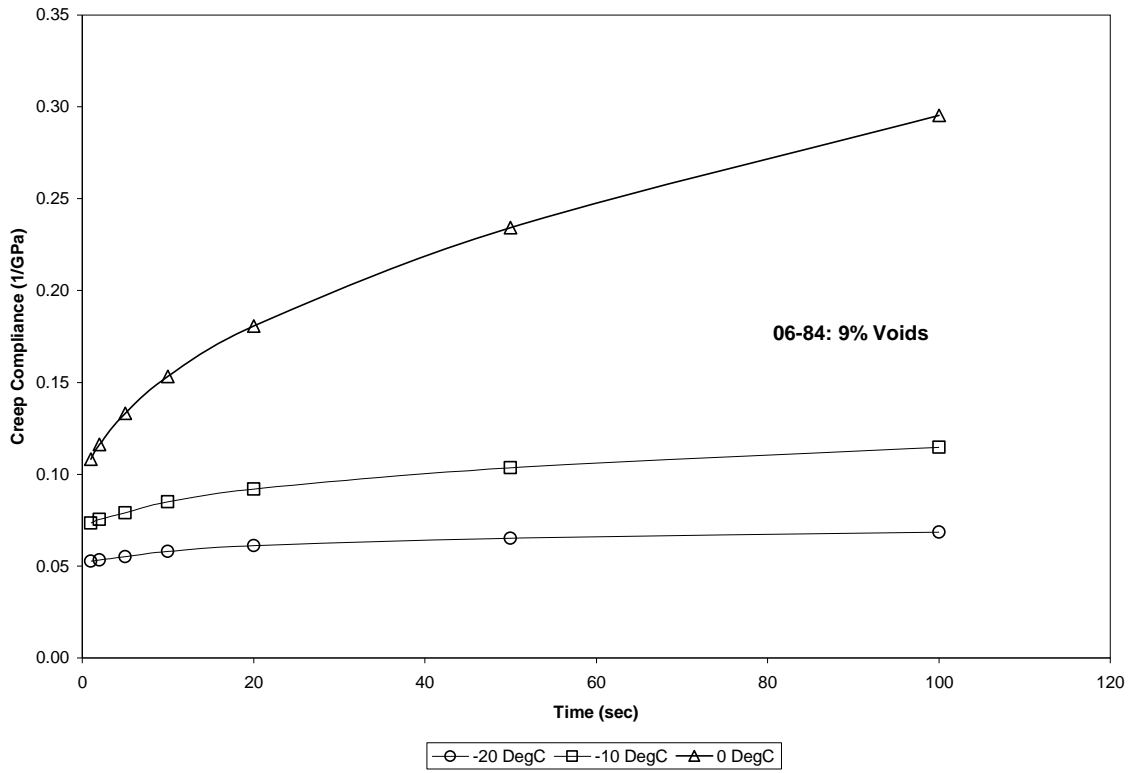


Figure A-35: 06-84 @ 9% Voids: Round 2

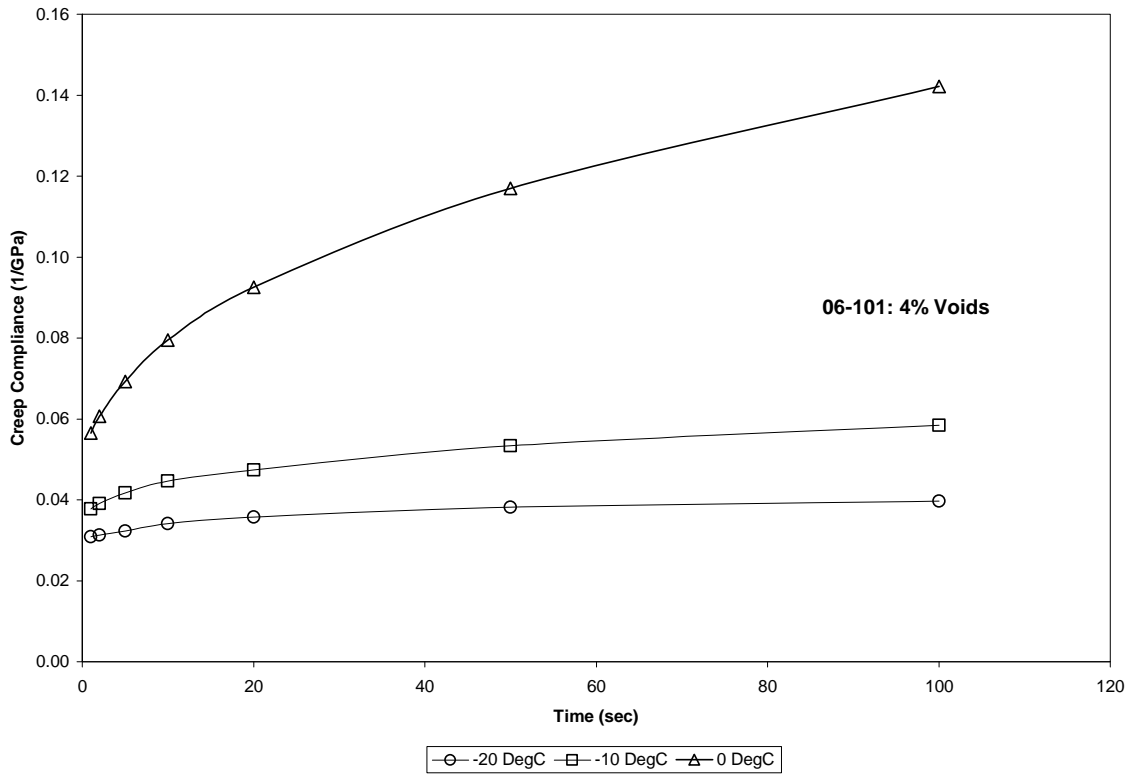


Figure A-36: 06-101 @ 4% Voids

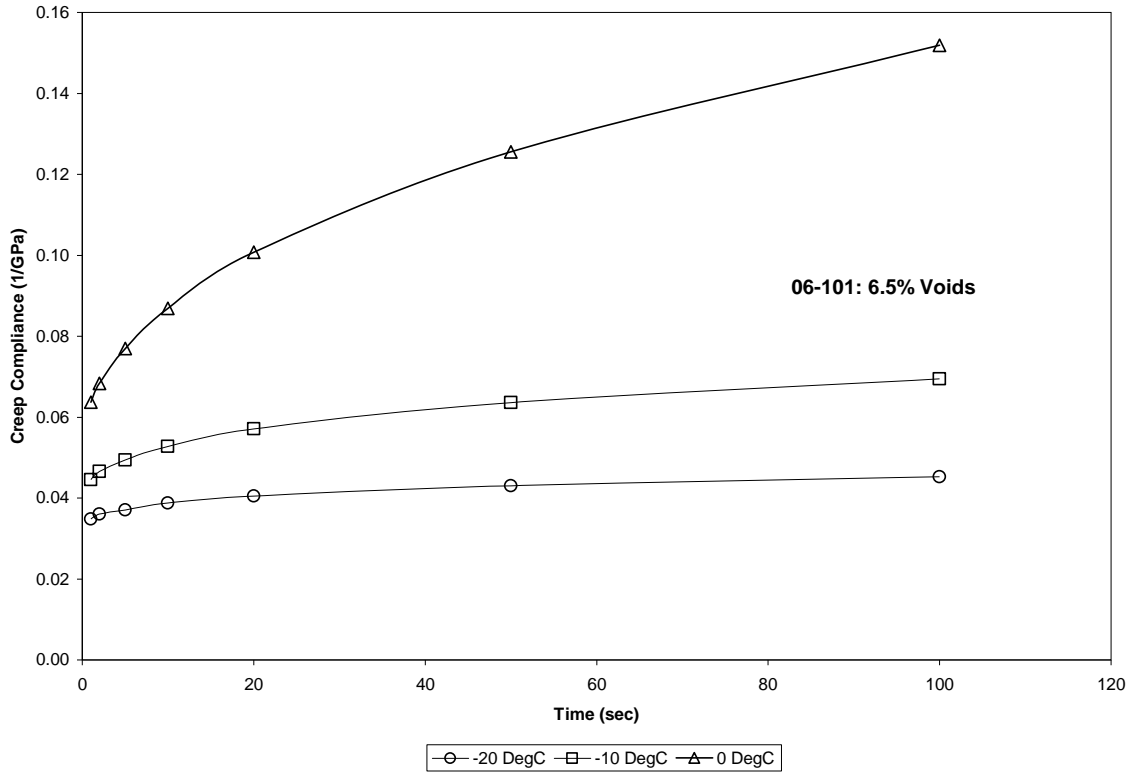


Figure A-37: 06-101 @ 6.5% Voids

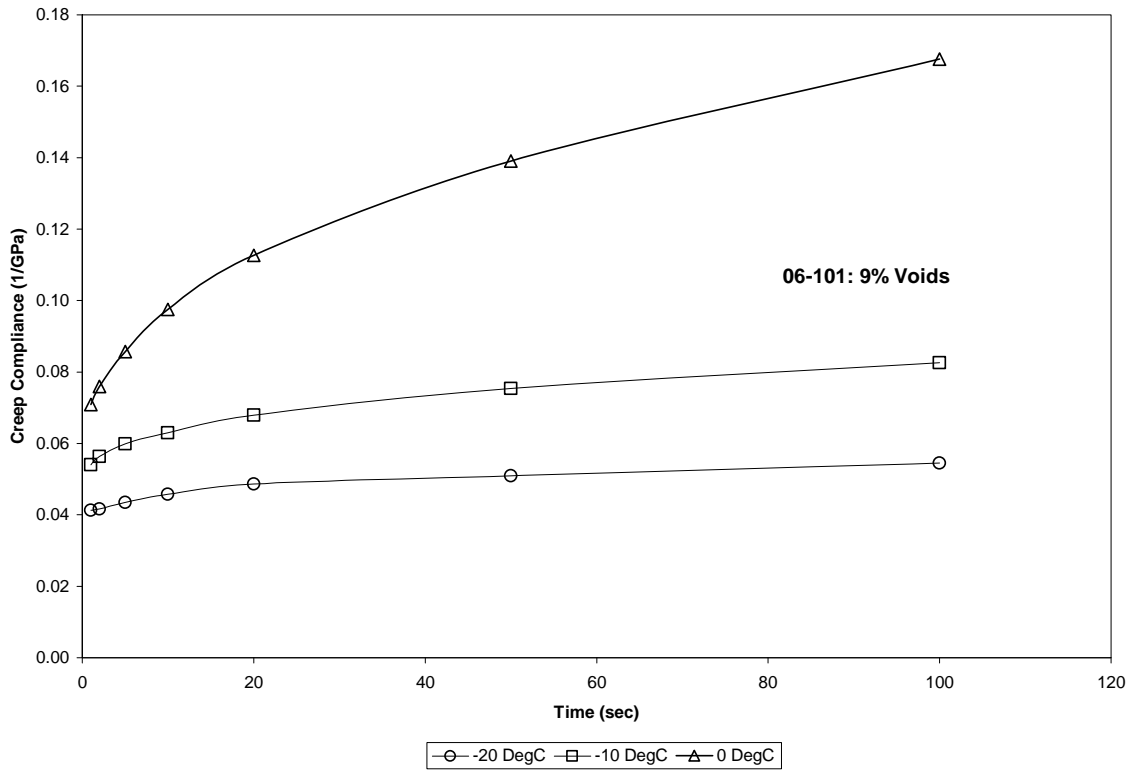


Figure A-38: 06-101 @ 9% Voids

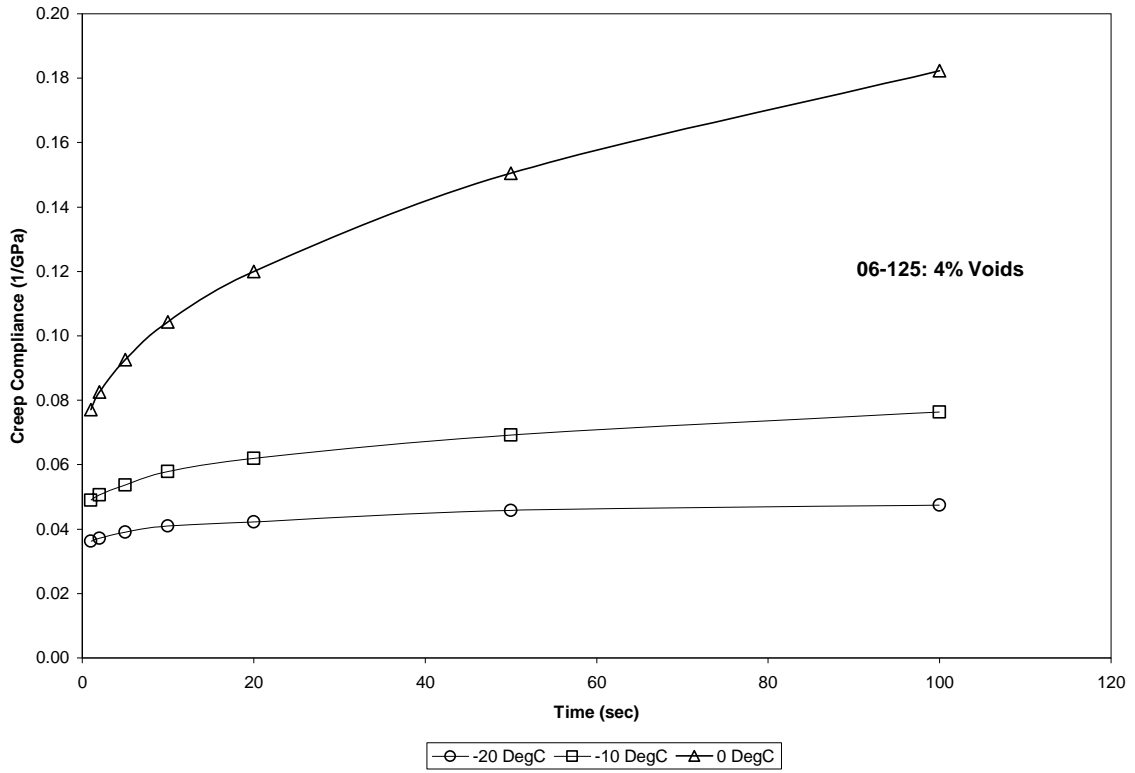


Figure A-39: 06-125 @ 4% Voids

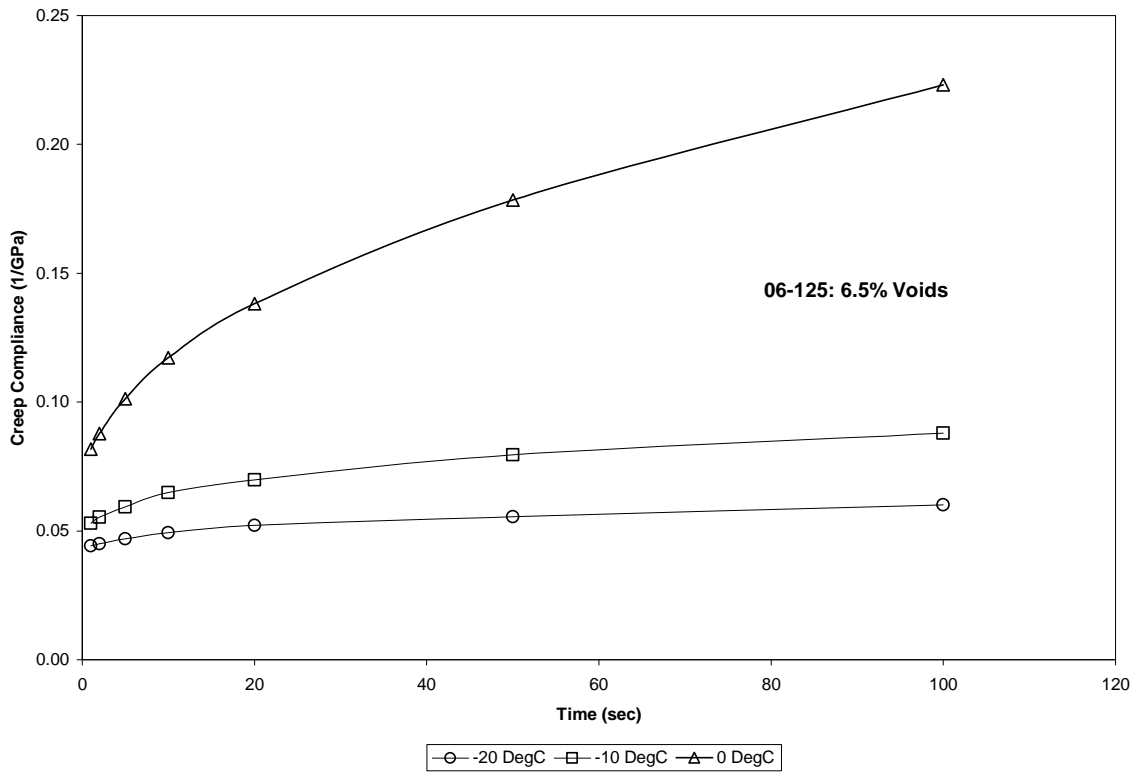


Figure A-40: 06-125 @ 6.5% Voids

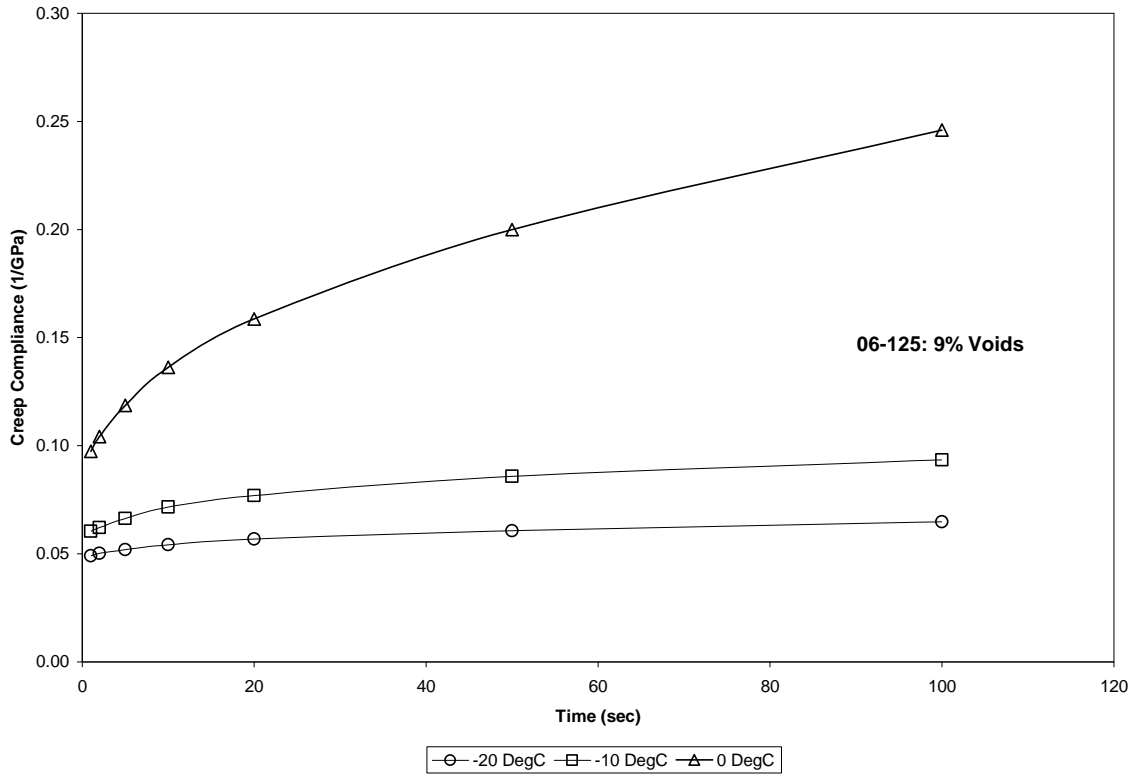


Figure A-41: 06-125 @ 9% Voids

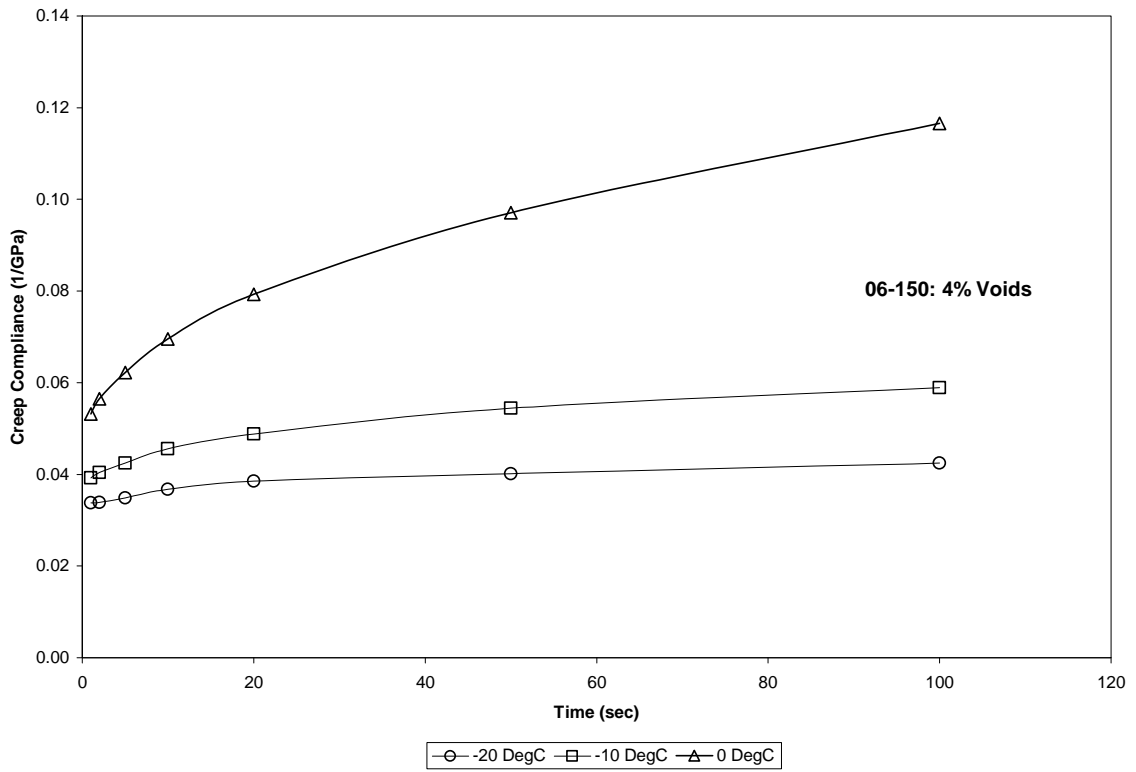


Figure A-42: 06-150 @ 4% Voids

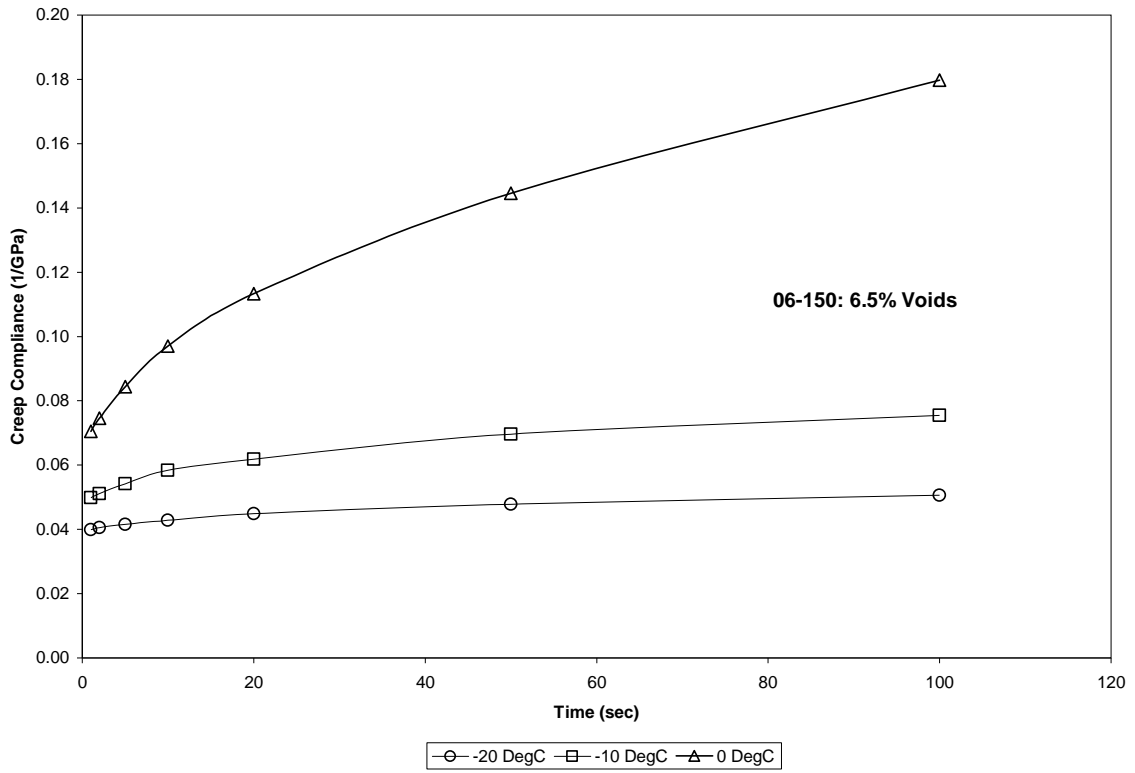


Figure A-43: 06-150 @ 6.5% Voids

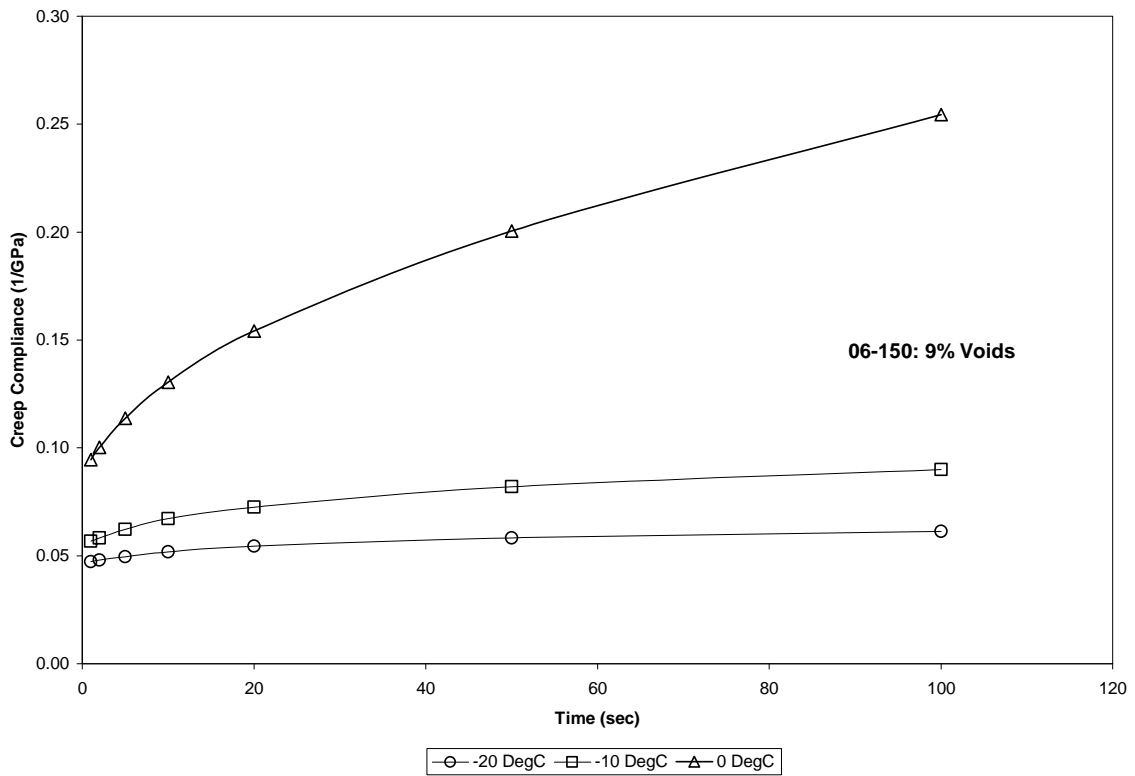


Figure A-44: 06-150 @ 9% Voids

APPENDIX B: TENSILE STRENGTH & TENSILE FAILURE STRAIN

Table B-19: Non-instrumented Data @ -10°C: Part A

Mix Designation	07-123	%RAP	20.0									
Mix Type	BP1	RAP %AC	5.7									
Virgin Binder Grade	PG64-22	Total %AC	5.3									
%Virgin AC	4.2	%Fibers	0.0									
Gmm	2.501											
Tensile Strength												
AASHTO T 322-07												
NCHRP 530 Correction												
Specimen No.	Gmb	Voids (%)	Thickness (in) (mm)	Diameter (in) (mm)	Temp (deg C)	Pf.n (lbf)	St.n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	St.n (psi)	Avg. St (psi)
2	2.333	6.7	1.991 50.6	5.895 149.7	-10.0	13322.8	723				602	
3	2.338	6.5	1.991 50.6	5.898 149.8	-9.7	11937.3	647	649	73.2	11.3%	543	544
14	2.342	6.3	1.994 50.6	5.899 149.8	-9.6	10645.8	576				487	
Average	2.338	6.5	1.992 50.6	5.897 149.8	-9.8							
5	2.334	6.7	1.994 50.6	5.901 149.9	-9.5	8598.6	465				401	
13	2.342	6.4	1.997 50.7	5.897 149.8	-9.6	11264.6	609	576	98.1	17.0%	513	487
15	2.344	6.3	2.001 50.8	5.898 149.8	-9.5	12101.4	653				547	
Average	2.340	6.5	1.997 50.7	5.899 149.8	-9.5	Statistics for All 6		612	87.2	14.2%		515

Mix Designation	06-105	%RAP	10.0									
Mix Type	SP125C	RAP %AC	4.8									
Virgin Binder Grade	PG70-22	Total %AC	5.6									
%Virgin AC	5.1	%Fibers	0.0									
Gmm	2.455											
Tensile Strength												
AASHTO T 322-07												
NCHRP 530 Correction												
Specimen No.	Gmb	Voids (%)	Thickness (in) (mm)	Diameter (in) (mm)	Temp (deg C)	Pf.n (lbf)	St.n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	St.n (psi)	Avg. St (psi)
2	2.290	6.7	1.72 43.7	5.92 150.4	-9.5	9610.6	601				507	
5	2.295	6.5	1.72 43.7	5.92 150.4	-9.5	9784.5	612	616	18.2	3.0%	515	519
11	2.301	6.3	1.72 43.7	5.92 150.4	-9.5	10178.2	636				534	
Average	2.295	6.5	1.72 43.7	5.92 150.4	-9.5							

Mix Designation	06-84	%RAP	0.0									
Mix Type	SP125BSM	RAP %AC	0.0									
Virgin Binder Grade	PG76-22	Total %AC	6.3									
%Virgin AC	6.3	%Fibers	0.3									
Gmm	2.436											
Tensile Strength												
AASHTO T 322-07												
NCHRP 530 Correction												
Specimen No.	Gmb	Voids (%)	Thickness (in) (mm)	Diameter (in) (mm)	Temp (deg C)	Pf.n (lbf)	St.n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	St.n (psi)	Avg. St (psi)
2	2.344	3.8	1.990 50.5	5.903 149.9	-9.7	13924.6	755				627	
3	2.339	4.0	1.997 50.7	5.905 150.0	-9.5	13849.5	748	738	22.9	3.1%	621	614
16	2.334	4.2	1.999 50.8	5.906 150.0	-9.6	13204.3	712				593	
Average	2.339	4.0	1.995 50.7	5.905 150.0	-9.6							
7	2.282	6.3	1.967 50.0	5.895 149.7	-9.5	11626.0	638				536	
11	2.272	6.7	1.985 50.4	5.896 149.8	-9.6	10888.7	592	620	24.4	3.9%	500	522
14	2.277	6.5	1.977 50.2	5.901 149.9	-9.7	11538.1	630				529	
Average	2.277	6.5	1.976 50.2	5.897 149.8	-9.6							
6	2.211	9.2	1.984 50.4	5.907 150.0	-9.8	9439.1	513				438	
14	2.222	8.8	1.991 50.6	5.905 150.0	-10.3	10172.1	551	525	22.7	4.3%	468	447
19	2.217	9.0	1.983 50.4	5.906 150.0	-9.8	9390.9	510				436	
Average	2.217	9.0	1.986 50.4	5.906 150.0	-10.0							

Table B-20: Non-instrumented Data @ -10°C: Part B

Mix Designation			06-101		%RAP	0.0								
Mix Type			SP125B		RAP %AC	0.0								
Virgin Binder Grade			PG76-22		Total %AC	5.7								
%Virgin AC			5.7		%Fibers	0.0								
Gmm			2.515											
Specimen No.	Gmb	Voids (%)	Thickness		Diameter		Temp (deg C)	Tensile Strength						
			(in)	(mm)	(in)	(mm)		AASHTO T 322-07		NCHRP 530 Correction				
								Pf,n (lbf)	St,n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	St,n (psi)	Avg. St (psi)
4	2.421	3.8	1.985	50.4	5.895	149.7	-9.9	15002.8	816				675	
7	2.415	4.0	2.006	51.0	5.896	149.8	-10.0	16547.0	891	841	42.8	5.1%	733	694
11	2.410	4.2	2.003	50.9	5.897	149.8	-10.0	15153.9	817				675	
Average	2.415	4.0	1.998	50.7	5.896	149.8	-10.0	highlighted cells are Tinius-Olsen values						
2	2.352	6.5	1.988	50.5	5.898	149.8	-9.8	12315.1	669				560	
10	2.347	6.7	1.989	50.5	5.903	149.9	-9.7	11901.9	645	663	16.1	2.4%	541	555
17	2.357	6.3	1.999	50.8	5.904	150.0	-9.8	12535.4	676				565	
Average	2.352	6.5	1.992	50.6	5.902	149.9	-9.8							
4	2.284	9.2	1.992	50.6	5.903	149.9	-9.8	10836.2	587				496	
6	2.288	9.0	1.989	50.5	5.902	149.9	-9.6	11270.8	611	601	12.8	2.1%	515	507
18	2.294	8.8	1.994	50.6	5.908	150.1	-10.0	11196.9	605				510	
Average	2.289	9.0	1.992	50.6	5.904	150.0	-9.8							

Mix Designation			06-125		%RAP	0.0								
Mix Type			SP125C		RAP %AC	0.0								
Virgin Binder Grade			PG64-22		Total %AC	6.5								
%Virgin AC			6.5		%Fibers	0.0								
Gmm			2.412											
Specimen No.	Gmb	Voids (%)	Thickness		Diameter		Temp (deg C)	Tensile Strength						
			(in)	(mm)	(in)	(mm)		AASHTO T 322-07		NCHRP 530 Correction				
								Pf,n (lbf)	St,n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	St,n (psi)	Avg. St (psi)
1	2.315	4.0	1.976	50.2	5.908	150.1	-9.6	12191.2	665				557	
20	2.321	3.8	2.001	50.8	5.904	150.0	-9.9	13492.4	727	696	31.1	4.5%	605	581
24	2.331	4.2	2.004	50.9	5.906	150.0	-9.9	12926.6	695				580	
Average	2.322	4.0	1.994	50.6	5.906	150.0	-9.8							
18	2.249	6.7	1.998	50.7	5.911	150.1	-9.7	11544.2	622				523	
23	2.260	6.3	1.991	50.6	5.903	149.9	-9.6	11703.5	634	623	10.0	1.6%	532	524
24	2.255	6.5	1.961	49.8	5.911	150.1	-9.7	11181.0	614				517	
Average	2.255	6.5	1.983	50.4	5.908	150.1	-9.7							
4	2.190	9.2	2.001	50.8	5.912	150.2	-9.6	9657.6	520				443	
6	2.196	9.0	1.989	50.5	5.908	150.1	-9.5	9892.0	536	532	11.2	2.1%	456	453
8	2.200	8.8	1.970	50.0	5.909	150.1	-9.6	9896.2	541				460	
Average	2.195	9.0	1.987	50.5	5.910	150.1	-9.6							

Mix Designation			06-150		%RAP	10.0								
Mix Type			SP125C		RAP %AC	4.8								
Virgin Binder Grade			PG70-22		Total %AC	5.5								
%Virgin AC			5.0		%Fibers	0.0								
Gmm			2.467											
Specimen No.	Gmb	Voids (%)	Thickness		Diameter		Temp (deg C)	Tensile Strength						
			(in)	(mm)	(in)	(mm)		AASHTO T 322-07		NCHRP 530 Correction				
								Pf,n (lbf)	St,n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	St,n (psi)	Avg. St (psi)
2	2.364	4.2	1.980	50.3	5.904	150.0	-9.5	13949.6	760				631	
6	2.369	4.0	1.973	50.1	5.901	149.9	-9.6	13838.6	757	786	48.8	6.2%	628	651
11	2.370	3.9	1.987	50.5	5.900	149.9	-9.5	15516.3	843				695	
Average	2.368	4.0	1.980	50.3	5.902	149.9	-9.5	highlighted cells are Tinius-Olsen values						
4	2.301	6.7	1.985	50.4	5.906	150.0	-9.6	11771.2	639				537	
9	2.313	6.2	1.981	50.3	5.901	149.9	-9.6	12719.1	693	674	30.3	4.5%	578	564
11	2.307	6.5	1.978	50.2	5.907	150.0	-9.6	12675.2	691				577	
Average	2.307	6.5	1.981	50.3	5.905	150.0	-9.6							
1	2.240	9.2	1.971	50.1	5.911	150.1	-9.6	11340.9	620				521	
11	2.249	8.8	1.974	50.1	5.916	150.3	-10.3	10988.2	599	599	21.1	3.5%	505	505
19	2.245	9.0	1.970	50.0	5.918	150.3	-9.6	10575.6	577				488	
Average	2.245	9.0	1.972	50.1	5.915	150.2	-9.8							

Table B-21: Instrumented Data @ 21.1°C: Part A

Tensile Strength											
AAASHTO T 322-07											
Specimen No.	Gmb	Voids (%)	Thickness (mm)		Diameter (mm)	Temp (deg C)	P _f n (lb)	St _n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)
			(in)	(mm)							
13	2.338	4.0	1.994	50.6	5.897	21.2	3774.6	204	195	9.1	4.7%
20	2.328	4.4	1.994	50.6	5.897	21.0	3682.5	194	195	9.1	4.7%
21	2.349	3.6	1.989	50.5	5.898	20.9	3429.6	186			
Average	2.338	4.0	1.992	50.6	5.897	21.0	3135.9	171	171	166	
16	2.280	6.4	1.980	50.3	5.909	21.2	3217.6	174	166	11.9	7.2%
19	2.278	6.5	1.995	50.7	5.898	21.2	2790.4	152			
20	2.276	6.6	1.981	50.3	5.900	21.2	2790.4	152			
Average	2.278	6.5	1.985	50.4	5.902	21.2	2513.2	136	140	7.4	5.3%
2	2.209	9.3	2.000	50.8	5.910	21.3	2765.0	149			
13	2.212	9.2	2.005	50.9	5.903	21.2	2503.9	137			
28	2.223	8.7	1.976	50.2	5.906	21.2					
Average	2.215	9.1	1.994	50.6	5.906	21.2					

Tensile Strength											
AAASHTO T 322-07											
Specimen No.	Gmb	Voids (%)	Thickness (mm)		Diameter (mm)	Temp (deg C)	P _f n (lb)	St _n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)
			(in)	(mm)							
2	2.417	3.9	1.977	50.2	5.892	21.4	4389.3	240	225	13.3	5.9%
6	2.413	4.1	1.992	50.6	5.900	21.1	4095.9	222	226	10.6	4.7%
22	2.412	4.1	2.001	50.8	5.902	21.1	3967.8	214	230		
Average	2.414	4.0	1.990	50.5	5.898	21.2	3952.6	214	226	11.3	6.6%
18	2.361	6.1	1.991	50.6	5.901	21.2	4241.4	230			
20	2.345	6.8	2.007	51.0	5.903	21.2	3198.3	173	171	11.3	6.6%
27	2.353	6.5	1.986	50.4	5.901	21.2	3336.3	181			
Average	2.353	6.5	1.995	50.7	5.902	21.2	2948.6	159			
2	2.290	8.9	1.991	50.6	5.905	21.2					
21	2.286	9.1	1.984	50.4	5.909	21.2					
28	2.286	9.1	1.988	50.7	5.908	21.3					
Average	2.287	9.0	1.991	50.6	5.907	21.2					

Table B-22: Instrumented Data @ 21.1°C: Part B

Specimen No.	Gmb	Voids (%)	Temp (deg C)	Thickness		Diameter		Tensile Strength				Horizontal Deformations (mm)				Failure Strain (microstrain)		
				AAASHTO T 322-07		AAASHTO T 322-07		Pt,n (lbf)	St,n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	North	South	Average	North	South	Average
				(in)	(mm)	(in)	(mm)											
14	2.318	3.9	21.1	1.996	50.7	5.908	150.1	3081.8	166	158	8.0	5.1%	6.1602E-03	6.4012E-03	6.2807E-03	162	168	165
25	2.314	4.1	21.2	1.962	49.8	5.900	149.9	2742.1	151	158	8.0	5.1%	6.8786E-03	9.7883E-03	8.3334E-03	181	258	219
26	2.308	4.3	21.3	1.918	48.7	5.902	149.9	2766.9	156	158	8.0	5.1%	5.7384E-03	9.0386E-03	7.3691E-03	151	238	194
Average	2.313	4.1	21.2	1.959	49.8	5.903	149.9	2766.9	156	158	8.0	5.1%	6.1602E-03	6.4012E-03	6.2807E-03	162	168	165
10	2.262	6.2	21.2	2.000	50.8	5.902	149.9	2342.7	126	135	9.0	6.7%	1.0887E-02	1.1707E-02	1.1297E-02	286	308	297
19	2.245	6.9	21.3	1.976	50.2	5.915	150.2	2456.5	134	135	9.0	6.7%	7.0332E-03	7.5513E-03	7.2923E-03	185	199	192
29	2.261	6.3	21.0	1.993	50.6	5.911	150.1	2670.7	144	135	9.0	6.7%	6.3868E-03	8.1031E-03	7.2450E-03	168	213	191
Average	2.256	6.5	21.2	1.990	50.5	5.909	150.1	2670.7	144	135	9.0	6.7%	6.3868E-03	8.1031E-03	7.2450E-03	168	213	191
5	2.186	9.4	21.3	1.991	50.6	5.919	150.3	2539.2	137	130	6.1	4.7%	3.0320E-03	6.6704E-03	4.8512E-03	80	176	128
16	2.195	9.0	21.3	2.002	50.9	5.913	150.2	2329.4	125	130	6.1	4.7%	1.0888E-02	7.4115E-03	9.1497E-03	287	195	241
28	2.206	8.6	21.1	1.990	50.5	5.909	150.1	2380.9	129	130	6.1	4.7%	7.4711E-03	5.6799E-03	6.5756E-03	197	149	173
Average	2.196	9.0	21.2	1.994	50.7	5.914	150.2	2380.9	129	130	6.1	4.7%	7.4711E-03	5.6799E-03	6.5756E-03	197	149	173

Specimen No.	Gmb	Voids (%)	Temp (deg C)	Thickness		Diameter		Tensile Strength				Horizontal Deformations (mm)				Failure Strain (microstrain)		
				AAASHTO T 322-07		AAASHTO T 322-07		Pt,n (lbf)	St,n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	North	South	Average	North	South	Average
				(in)	(mm)	(in)	(mm)											
7	2.365	4.1	21.3	1.998	50.7	5.901	149.9	3314.9	179	184	5.0	2.7%	6.0567E-03	8.8484E-03	7.4526E-03	159	233	196
14	2.365	4.1	21.3	1.978	50.2	5.900	149.9	3366.5	184	184	5.0	2.7%	5.9546E-03	8.0853E-03	7.0199E-03	157	213	185
17	2.368	4.0	21.3	1.981	50.3	5.902	149.9	3470.5	189	189	5.0	2.7%	6.8051E-03	5.0729E-03	5.9390E-03	179	133	156
Average	2.366	4.1	21.3	1.986	50.4	5.901	149.9	3470.5	189	189	5.0	2.7%	6.8051E-03	5.0729E-03	5.9390E-03	179	133	156
23	2.300	6.8	21.5	1.993	50.6	5.906	150.0	2800.4	151	153	1.9	1.2%	7.3935E-03	1.0033E-02	8.7131E-03	195	264	229
8	2.299	6.8	21.4	1.993	50.6	5.904	150.0	2868.6	155	153	1.9	1.2%	8.0818E-03	9.1102E-03	8.5960E-03	213	240	226
21	2.302	6.7	21.4	1.968	50.5	5.904	150.0	2835.1	154	154	1.9	1.2%	6.7169E-03	1.0757E-02	8.7367E-03	177	283	230
Average	2.300	6.8	21.4	1.991	50.6	5.905	150.0	2835.1	154	154	1.9	1.2%	6.7169E-03	1.0757E-02	8.7367E-03	177	283	230
18	2.245	9.0	21.2	1.975	50.2	5.913	150.2	2457.1	134	132	5.7	4.3%	5.5853E-03	1.1737E-02	8.6911E-03	147	310	229
25	2.247	8.9	21.5	1.991	50.6	5.923	150.4	2322.1	125	132	5.7	4.3%	8.5425E-03	1.3138E-02	1.0840E-02	225	346	285
24	2.241	9.2	21.3	1.986	50.4	5.922	150.4	2513.8	136	136	5.7	4.3%	8.5356E-03	1.3036E-02	1.0786E-02	225	343	284
Average	2.244	9.0	21.3	1.984	50.4	5.919	150.4	2513.8	136	136	5.7	4.3%	8.5356E-03	1.3036E-02	1.0786E-02	225	343	284

Table B-23: Instrumented Data @ 4.4°C: Part A

Specimen No.	Gmb	Voids (%)	Thickness (in)	Thickness (mm)	Diameter		Temp (deg C)	Tensile Strength AASHTO T 322-07				Horizontal Deformations (mm)			Failure Strain (microstrain)				
					(in)	(mm)		Pf,n (lbf)	St,n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	North	South	Average	North	South	Average	
																			(in)
6	2.330	4.3	1.989	50.5	5.895	149.7	4.7	8119.5	441	460	18.8	4.1%	2.2650E-03	1.6101E-03	1.9376E-03	60	42	51	
8	2.346	3.7	2.004	50.9	5.901	149.9	4.7	8655.3	461	460	18.8	4.1%	3.0128E-03	1.7412E-03	2.3770E-03	79	46	63	
24	2.339	4.0	1.997	50.7	5.900	149.9	4.7	8855.0	478				3.9349E-03	1.8839E-03	2.9094E-03	104	50	77	
Average	2.338	4.0	1.997	50.7	5.899	149.8	4.7						Average	2.4080E-03					63
2	2.276	6.6	1.986	50.4	5.906	150.0	4.6	7418.0	403	419	23.2	5.5%	3.4384E-03	1.2129E-03	2.3257E-03	90	32	61	
9	2.281	6.4	1.994	50.6	5.903	149.9	4.7	7571.4	410	419	23.2	5.5%	1.1101E-03	2.4821E-03	1.7961E-03	29	65	47	
18	2.277	6.5	1.973	50.1	5.895	149.7	4.7	8145.8	446				1.4662E-03	2.6228E-03	2.0445E-03	39	69	54	
Average	2.278	6.5	1.984	50.4	5.901	149.9	4.7						Average	2.0554E-03					54
1	2.209	9.3	2.001	50.8	5.902	149.9	4.7	6376.5	344	341	3.0	0.9%	1.9550E-03	3.2763E-03	2.6166E-03	51	86	69	
23	2.216	9.0	1.988	50.5	5.907	150.0	4.6	6275.0	340				1.4100E-03	3.9655E-03	2.8878E-03	37	104	71	
25	2.223	8.8	1.995	50.7	5.911	150.1	4.7	6255.1	338				2.9748E-03	1.3945E-03	2.1846E-03	78	37	57	
Average	2.216	9.0	1.995	50.7	5.907	150.0	4.7						Average	2.4963E-03					66

Specimen No.	Gmb	Voids (%)	Thickness (in)	Thickness (mm)	Diameter		Temp (deg C)	Tensile Strength AASHTO T 322-07				Horizontal Deformations (mm)			Failure Strain (microstrain)				
					(in)	(mm)		Pf,n (lbf)	St,n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	North	South	Average	North	South	Average	
																			(in)
18	2.410	4.2	1.995	50.7	5.900	149.9	4.5	10548.7	571	543	27.0	5.0%	2.0025E-03	2.0213E-03	2.0119E-03	53	53	53	
20	2.413	4.0	2.006	51.0	5.894	149.7	4.7	9696.3	517	543	27.0	5.0%	4.0944E-03	1.6964E-03	2.8964E-03	108	45	76	
23	2.419	3.8	1.975	50.2	5.896	149.8	4.6	9908.4	542				8.3754E-04	4.9787E-03	2.9081E-03	22	131	77	
Average	2.414	4.0	1.992	50.6	5.897	149.8	4.6						Average	2.6051E-03					69
1	2.350	6.6	1.986	50.4	5.902	149.9	4.7	9028.9	490	492	22.6	4.6%	1.0861E-03	4.5516E-03	2.8188E-03	29	120	74	
14	2.369	6.2	1.996	50.7	5.904	150.0	4.7	9528.2	515	492	22.6	4.6%	3.0026E-03	2.5218E-03	2.7622E-03	79	66	73	
25	2.351	6.5	2.003	50.9	5.900	149.9	4.7	8716.4	470				5.3766E-04	2.9275E-03	1.7326E-03	14	77	46	
Average	2.353	6.4	1.995	50.7	5.902	149.9	4.7						Average	2.4379E-03					64
7	2.289	9.0	1.978	50.2	5.903	149.9	4.6	7828.2	427	401	28.5	7.1%	1.8130E-03	1.8972E-03	1.7551E-03	48	45	46	
22	2.291	8.9	1.999	50.8	5.905	150.0	4.9	7547.2	407				1.1722E-03	2.9698E-03	2.0710E-03	31	78	54	
25	2.287	9.1	2.002	50.9	5.895	149.7	4.9	6871.1	371				7.0913E-04	3.4605E-03	2.0848E-03	19	91	55	
Average	2.289	9.0	1.993	50.6	5.901	149.9	4.8						Average	1.9703E-03					52

Table B-24: Instrumented Data @ 4.4°C: Part B

Specimen No.	Gmb	Voids (%)	Thickness		Diameter (mm)	Temp (deg C)	Tensile Strength			Horizontal Deformations (mm)			Failure Strain (microstrain)				
			(in)	(mm)			Pf,n (lbf)	St,n (psi)	Avg. St (psi)	St SD (psi)	St CV (%)	North	South	Average	North	South	Average
Mix Designation 06-125 %RAP 0.0 Mix Type SP125C RAP %AC 0.0 Virgin Binder Grade PG64-22 Total %AC 6.5 %Virgin AC 6.5 %Fibers 0.0 Gmm 2.412																	
6	2,319	3.9	1.982	50.3	5.903	4.3	8466.2	461				1.5565E-03	2.6032E-03	2.0809E-03	41	69	55
10	2,312	4.1	2.085	53.0	5.905	4.6	8970.3	464	465	5.8	1.2%	1.8730E-03	1.4787E-03	1.6758E-03	49	39	44
13	2,308	4.3	2.015	51.2	5.906	4.6	8620.8	472				2.4177E-03	1.7993E-03	2.1085E-03	64	47	55
Average	2,313	4.1	2.027	51.5	5.905	4.5						Average	1.9551E-03				51
13	2,248	6.8	1.966	50.4	5.907	4.6	7068.2	384				8.7816E-04	3.5948E-03	2.2365E-03	23	95	59
26	2,259	6.3	2.009	51.0	5.906	4.6	6719.7	361	360	18.0	4.7%	1.1535E-03	2.4524E-03	1.8029E-03	30	65	47
28	2,263	6.2	1.989	50.5	5.904	4.6	7304.1	396				2.5214E-03	8.4765E-04	1.6845E-03	66	22	44
Average	2,257	6.4	1.995	50.7	5.906	4.6						Average	1.9080E-03				50
9	2,190	9.2	1.997	50.7	5.918	4.3	6147.1	331				2.0454E-03	1.6390E-03	1.8422E-03	54	43	48
11	2,194	9.0	1.993	50.6	5.915	4.4	6276.8	339	336	3.9	1.2%	2.0037E-03	1.5196E-03	1.7616E-03	53	40	46
20	2,203	8.7	1.994	50.6	5.911	4.6	6214.6	336				2.4821E-03	1.2316E-03	1.8569E-03	65	32	49
Average	2,196	9.0	1.995	50.7	5.915	4.4						Average	1.6202E-03				48
Mix Designation 06-150 %RAP 10.0 Mix Type SP125C RAP %AC 4.8 Virgin Binder Grade PG70-22 Total %AC 5.5 %Virgin AC 5.0 %Fibers 0.0 Gmm 2.467																	
4	2,365	4.1	1.981	50.3	5.900	4.4	9078.4	494				1.5633E-03	4.2285E-03	2.8959E-03	41	111	76
19	2,367	4.1	1.994	50.6	5.899	4.6	9788.8	530	520	21.9	4.2%	2.4197E-03	3.9886E-03	3.2041E-03	64	105	84
20	2,370	4.0	1.967	50.0	5.897	4.7	9741.2	535				1.6263E-03	5.5593E-03	3.5928E-03	43	146	95
Average	2,367	4.1	1.981	50.3	5.899	4.6						Average	3.2309E-03				85
2	2,299	6.8	1.978	50.2	5.904	4.7	8182.4	446				1.2578E-03	3.9871E-03	2.6224E-03	33	105	69
7	2,298	6.8	1.973	50.1	5.913	4.7	7669.9	419	438	16.5	3.8%	3.2145E-03	1.6358E-03	2.4252E-03	85	43	64
12	2,296	6.9	1.984	50.4	5.904	4.8	8243.4	448				1.2256E-03	2.6478E-03	1.9367E-03	32	70	51
Average	2,298	6.8	1.978	50.2	5.907	4.7						Average	2.3281E-03				61
8	2,237	9.3	1.966	49.7	5.915	4.4	6873.0	378				2.6945E-03	1.7789E-03	2.2357E-03	71	47	59
9	2,244	9.1	1.991	50.6	5.908	4.7	7528.1	407	388	17.0	4.4%	2.4755E-03	1.4490E-03	1.9622E-03	65	38	52
13	2,252	8.7	1.979	50.3	5.909	4.7	6941.6	378				3.3920E-03	1.3244E-03	2.3582E-03	89	35	62
Average	2,244	9.0	1.975	50.2	5.911	4.6						Average	2.1854E-03				58

Table B-25: Instrumented Data @ -10°C: 07-123 & 06-105

Mix Designation		07-123		%RAP		20.0										
Mix Type		BP1		RAP %AC		5.7										
Virgin Binder Grade		PG64-22		Total %AC		5.3										
%Virgin AC		4.2		%Fibers		0.0										
Gmm		2.501														
Specimen No.	Gmb	Voids (%)	Thickness		Diameter	Temp (deg C)	Tensile Strength									
			(in)	(mm)			AASHTO T 322-07		NCHRP 530 Correction		AASHTO T 322-03					
16	2.331	6.8	1.995	50.7	5.901	149.9	640	537	505	594	59.6	10.0%				
17	2.333	6.7	1.997	50.7	5.901	149.9	542	460	505	527	59.6	10.0%				
18	2.331	6.8	1.983	50.4	5.905	150.0	617	519	505	594	59.6	10.0%				
Average	2.332	6.8	1.992	50.6	5.902	149.9										
Specimen No.	Gmb	Voids (%)	Thickness		Diameter	Temp (deg C)	Horizontal Deformations (mm)				Failure Strain (microstrain)					
			(in)	(mm)			At (Y - X) peak		At Maximum Load		At (Y - X) peak		At Maximum Load			
16	2.331	6.8	1.995	50.7	5.901	149.9	5.8338E-04	5.6673E-04	5.8338E-04	5.6673E-04	15	14	15	14	15	
17	2.333	6.7	1.997	50.7	5.901	149.9	6.9512E-04	4.3674E-04	6.9512E-04	4.3674E-04	18	5	11	18	6	
18	2.331	6.8	1.983	50.4	5.905	150.0	2.1927E-04	4.0067E-04	2.1927E-04	4.0067E-04	6	15	11	6	15	
Average	2.332	6.8	1.992	50.6	5.902	149.9					Average			Average		12

Mix Designation		06-105		%RAP		10.0								
Mix Type		SPT25C		RAP %AC		4.8								
Virgin Binder Grade		PG70-22		Total %AC		5.6								
%Virgin AC		5.1		%Fibers		0.0								
Gmm		2.455												
Specimen No.	Gmb	Voids (%)	Thickness		Diameter	Temp (deg C)	Tensile Strength							
			(in)	(mm)			AASHTO T 322-07		NCHRP 530 Correction		AASHTO T 322-03			
3	2.306	6.1	1.73	43.9	5.92	150.4	612	515	483	0	0	0.0	#DIV/0!	
8	2.282	7.0	1.72	43.7	5.91	150.1	8791.5	487	483	0	0	0.0	#DIV/0!	
9	2.297	6.4	1.73	43.9	5.92	150.4	8860.5	488	483	0	0	0.0	#DIV/0!	
Average	2.295	6.5	1.73	43.9	5.92	150.3								
Specimen No.	Gmb	Voids (%)	Thickness		Diameter	Temp (deg C)	Horizontal Deformations (mm)				Failure Strain (microstrain)			
			(in)	(mm)			At (Y - X) peak		At Maximum Load		At (Y - X) peak		At Maximum Load	
3	2.306	6.1	1.73	43.9	5.92	150.4	8.1733E-04	7.7491E-04	8.1733E-04	7.9612E-04	22	20	21	
8	2.282	7.0	1.72	43.7	5.91	150.1	3.8602E-04	5.6931E-04	3.8602E-04	4.7766E-04	10	15	13	
9	2.297	6.4	1.73	43.9	5.92	150.4	6.6730E-05	1.3777E-03	7.2223E-04	2	36	19		
Average	2.295	6.5	1.73	43.9	5.92	150.3				Average			Average	#DIV/0!

indicates an instance of first failure

Ending horizontal deformation taken as the reading on the same line as maximum difference between vertical and horizontal deformation

Table B-26: Instrumented Data @ -10°C: 06-84

Specimen No.	Gmb	Voids (%)	Thickness		Temp (deg C)	Tensile Strength										
			(in)	(mm)		AASHTO T 322-07		NCHRP 530 Correction		AASHTO T 322-03						
						Pf,n (lb)	St,n (psi)	Avg, St (psi)	St, n (psi)	Avg, St (psi)	St, n (psi)	Pf,n (lb)	St, n (psi)	Avg, St (psi)	St, n (psi)	St CV (%)
4	2.340	4.0	1.979	50.3	-10.0	12406.6	577	697	566	0	0	0	0	0.0	#DIV/0!	
7	2.336	4.1	2.000	50.8	-10.0	13244.0	715	699	596	581	0	0	0	0.0	#DIV/0!	
23	2.337	4.1	1.956	49.7	-10.0	12865.4	699		583	0	0	0	0	0.0	#DIV/0!	
Average	2.338	4.1	1.978	50.2	-10.0											
12	2.274	6.7	1.995	50.7	-10.0	12029.4	649	618	544	520	0	0	0	0.0	#DIV/0!	
15	2.278	6.5	1.999	50.8	-10.1	10446.8	564	618	478	520	0	0	0	0.0	#DIV/0!	
23	2.282	6.3	1.988	50.5	-10.0	11782.8	640		537	0	0	0	0	0.0	#DIV/0!	
Average	2.278	6.5	1.994	50.6	-10.0											
11	2.211	9.2	1.994	50.6	-10.2	9998.2	540	551	460	467	0	0	0	0.0	#DIV/0!	
26	2.217	9.0	1.983	50.4	-9.7	9164.4	498		427	467	0	0	0	0.0	#DIV/0!	
27	2.223	8.8	1.997	50.7	-9.9	11355.0	613		516	0	0	0	0	0.0	#DIV/0!	
Average	2.217	9.0	1.991	50.6	-9.9											

Specimen No.	Gmb	Voids (%)	Thickness		Temp (deg C)	Horizontal Deformations (mm)				Failure Strain (microstrain)						
			(in)	(mm)		At Maximum Load		At (Y-X) peak		At Maximum Load		At (Y-X) peak				
						North	South	North	South	North	South	North	South	Average	Average	
4	2.340	4.0	1.979	50.3	-10.0	5.6494E-04	9.0663E-04	7.3578E-04	15	24	19					
7	2.336	4.1	2.000	50.8	-10.0	5.0361E-04	6.7086E-04	5.8724E-04	13	18	15					
23	2.337	4.1	1.956	49.7	-10.0	3.2247E-04	1.0770E-03	6.9973E-04	8	28	18					
Average	2.338	4.1	1.978	50.2	-10.0	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average
12	2.274	6.7	1.995	50.7	-10.0	1.5408E-03	4.9095E-04	1.0159E-03	41	13	27					
15	2.278	6.5	1.999	50.8	-10.1	6.2882E-04	8.5322E-04	7.4102E-04	17	22	20					
23	2.282	6.3	1.988	50.5	-10.0	3.0918E-04	2.2304E-03	1.2898E-03	8	59	33					
Average	2.278	6.5	1.994	50.6	-10.0	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average
11	2.211	9.2	1.994	50.6	-10.2	1.1227E-03	5.0068E-04	8.1171E-04	30	13	21					
26	2.217	9.0	1.983	50.4	-9.7	9.9439E-04	6.3455E-04	8.1447E-04	26	17	21					
27	2.223	8.8	1.997	50.7	-9.9	4.3575E-04	1.7759E-03	1.1056E-03	11	47	29					
Average	2.217	9.0	1.991	50.6	-9.9	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average

Indicates an instance of first failure

Ending horizontal deformation taken as the reading on the same line as the maximum difference between vertical and horizontal deformation

Table B-27: Instrumented Data @ -10°C: 06-101

Specimen No.	Gmb	Voids (%)	Thickness		Temp (deg C)	Tensile Strength									
			(in)	(mm)		AASHTO T 322-07			NCHRP 530 Correction			AASHTO T 322-03			
						Pf,n (lb)	St,n (psi)	Avg, St (psi)	St, CV (%)	St,n (psi)	Avg, St (psi)	Pf,n (lb)	St,n (psi)	Avg, St (psi)	St, CV (%)
1	2.421	3.8	1.993	50.6	5.884	149.7	-9.9	790	655	0	0	0	0.0	#DIV/0!	
3	2.409	4.2	2.001	50.8	5.898	149.8	-9.8	761	632	641	0	0	0.0	#DIV/0!	
13	2.414	4.0	2.000	50.8	5.896	149.8	-9.9	767	636	0	0	0	0.0	#DIV/0!	
Average	2.415	4.0	1.998	50.7	5.896	149.8	-9.9								
8	2.347	6.7	2.007	51.0	5.906	150.0	-10.3	617	519	10792.8	560	625	39.7	6.4%	
16	2.360	6.5	2.000	50.8	5.906	150.0	-10.0	642	538	535	11903.1	642	625	39.7	6.4%
26	2.368	6.2	2.002	50.9	5.896	149.8	-9.9	654	548	12119.8	654	625	39.7	6.4%	
Average	2.352	6.5	2.003	50.9	5.903	149.9	-10.1								
8	2.289	9.0	1.993	50.6	5.904	150.0	-10.0	588	497	0	0	0	0.0	#DIV/0!	
11	2.283	9.2	1.977	50.2	5.897	149.8	-10.0	574	485	485	0	0	0.0	#DIV/0!	
26	2.293	8.8	1.987	50.5	5.903	149.9	-9.9	558	473	0	0	0	0.0	#DIV/0!	
Average	2.288	9.0	1.986	50.4	5.901	149.9	-10.0								

Specimen No.	Gmb	Voids (%)	Thickness		Temp (deg C)	Horizontal Deformations (mm)						Failure Strain (microstrain)							
			(in)	(mm)		At Maximum Load			At (Y-X) peak			At Maximum Load			At (Y-X) peak				
						North	South	Average	North	South	Average	North	South	Average	North	South	Average		
1	2.421	3.8	1.993	50.6	5.884	149.7	-9.9	3.6580E-04	6.6074E-04	5.1327E-04	1.5470E-04	1.9705E-03	1.0626E-03	1	52	26	4	52	28
3	2.409	4.2	2.001	50.8	5.898	149.8	-9.8	3.3648E-04	9.4584E-04	6.4116E-04	4.2096E-04	6.1440E-04	5.1768E-04	11	16	14	11	16	14
13	2.414	4.0	2.000	50.8	5.896	149.8	-9.9	2.0830E-04	1.1824E-03	6.9534E-04	2.5428E-04	6.3165E-04	4.4297E-04	7	17	12	7	17	12
Average	2.415	4.0	1.998	50.7	5.896	149.8	-9.9												
8	2.347	6.7	2.007	51.0	5.906	150.0	-10.3	2.3756E-05	1.9705E-03	9.9712E-04	1.5470E-04	1.9705E-03	1.0626E-03	1	52	26	4	52	28
16	2.360	6.5	2.000	50.8	5.906	150.0	-10.0	4.2096E-04	6.1440E-04	5.1768E-04	4.2096E-04	6.1440E-04	5.1768E-04	11	16	14	11	16	14
26	2.368	6.2	2.002	50.9	5.896	149.8	-9.9	2.5428E-04	6.3165E-04	4.4297E-04	2.5428E-04	6.3165E-04	4.4297E-04	7	17	12	7	17	12
Average	2.352	6.5	2.003	50.9	5.903	149.9	-10.1												
8	2.289	9.0	1.993	50.6	5.904	150.0	-10.0	1.1259E-03	2.9866E-04	7.1238E-04	6.7441E-04	6.7441E-04	6.7441E-04	30	8	19			
11	2.283	9.2	1.977	50.2	5.897	149.8	-10.0	4.1363E-04	1.4178E-03	9.1571E-04				11	37	24			
26	2.293	8.8	1.987	50.5	5.903	149.9	-9.9	8.3473E-04	8.5893E-04	8.4689E-04				22	23	22			
Average	2.288	9.0	1.986	50.4	5.901	149.9	-10.0												

Indicates an instance of first failure

Ending horizontal deformation taken as the reading on the same line as maximum difference between vertical and horizontal deformation

Table B-29: Instrumented Data @ -10°C: 06-150

Specimen No.	Gmb	Voids (%)	Thickness (in)	Thickness (mm)	Diameter (in)	Diameter (mm)	Temp (deg C)	Tensile Strength														
								AASHTO T 322-07					NCHRP 530 Correction					AASHTO T 322-03				
								Pf.n (lb)	St.n (psi)	Avg. St (psi)	St.SD (psi)	St.CV (%)	Pf.n (lb)	St.n (psi)	Avg. St (psi)	St.SD (psi)	St.CV (%)	Pf.n (lb)	St.n (psi)	Avg. St (psi)	St.SD (psi)	St.CV (%)
10	2.363	4.2	1.973	50.1	5.900	149.9	-10.0	15159.9	829	782	43.6	5.6%	685	15159.9	829	734	47.5	6.1%				
13	2.369	4.0	1.999	50.8	5.898	149.8	-10.1	13757.3	743	782	43.6	5.6%	617	13601.7	734	780	47.5	6.1%				
26	2.371	3.9	1.993	50.6	5.899	149.8	-9.9	14315.2	775	775	64.3		643	14315.2	775	775						
Average	2.368	4.0	1.988	50.5	5.899	149.8	-10.0															
5	2.303	6.6	1.965	50.4	5.908	150.1	-9.8	11184.7	607	632	22.0	3.5%	512	11184.7	607	630	20.0	3.2%				
13	2.307	6.5	1.963	50.4	5.905	150.0	-9.8	11751.7	639	632	22.0	3.5%	536	11751.7	639	630	20.0	3.2%				
14	2.302	6.7	1.975	50.2	5.901	149.9	-9.7	11887.8	649	632	22.0	3.5%	545	11793.2	644	630	20.0	3.2%				
Average	2.304	6.6	1.981	50.3	5.906	150.0	-9.8															
5	2.244	9.1	1.965	49.9	5.923	150.4	-10.3	9789.4	535	551	15.5	2.8%	456	9779.1	535	550	15.8	2.9%				
6	2.251	8.7	1.963	50.4	5.906	150.0	-9.9	10421.8	567	551	15.5	2.8%	480	10421.8	567	550	15.8	2.9%				
17	2.240	9.2	1.996	50.7	5.915	150.2	-9.9	10193.5	550	550	15.5	2.8%	467	10193.5	550	550	15.8	2.9%				
Average	2.245	9.0	1.981	50.3	5.915	150.2	-10.0															
Specimen No.	Gmb	Voids (%)	Thickness (in)	Thickness (mm)	Diameter (in)	Diameter (mm)	Temp (deg C)	Horizontal Deformations (mm)														
								At Maximum Load					At (Y - X) peak					At (Y - X) peak				
								North	South	Average	North	South	Average	North	South	Average	North	South	Average	North	South	Average
10	2.363	4.2	1.973	50.1	5.900	149.9	-10.0	4.8545E-04	8.2024E-04	6.5284E-04	4.8845E-04	8.2024E-04	6.5284E-04	4.8845E-04	8.2024E-04	6.5284E-04	4.8845E-04	8.2024E-04	6.5284E-04			
13	2.369	4.0	1.999	50.8	5.898	149.8	-10.1	2.1924E-04	1.1759E-03	6.9754E-04	2.4096E-04	1.1759E-03	6.9754E-04	2.4096E-04	1.1759E-03	6.9754E-04	2.4096E-04	1.1759E-03	6.9754E-04			
26	2.371	3.9	1.993	50.6	5.899	149.8	-9.9	4.6333E-04	6.9266E-04	5.7799E-04	4.6333E-04	6.9266E-04	5.7799E-04	4.6333E-04	6.9266E-04	5.7799E-04	4.6333E-04	6.9266E-04	5.7799E-04			
Average	2.368	4.0	1.988	50.5	5.899	149.8	-10.0	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average			
5	2.303	6.6	1.965	50.4	5.908	150.1	-9.8	1.8824E-04	7.9069E-04	4.8946E-04	1.8824E-04	7.9069E-04	4.8946E-04	1.8824E-04	7.9069E-04	4.8946E-04	1.8824E-04	7.9069E-04	4.8946E-04			
13	2.307	6.5	1.963	50.4	5.905	150.0	-9.8	2.3198E-04	1.0721E-03	6.5204E-04	2.3198E-04	1.0721E-03	6.5204E-04	2.3198E-04	1.0721E-03	6.5204E-04	2.3198E-04	1.0721E-03	6.5204E-04			
14	2.302	6.7	1.975	50.2	5.901	149.9	-9.7	7.6259E-04	4.0355E-04	5.8307E-04	7.6259E-04	4.0355E-04	5.8307E-04	7.6259E-04	4.0355E-04	5.8307E-04	7.6259E-04	4.0355E-04	5.8307E-04			
Average	2.304	6.6	1.981	50.3	5.905	150.0	-9.8	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average			
5	2.244	9.1	1.965	49.9	5.923	150.4	-10.3	2.3487E-04	1.2611E-03	7.4798E-04	2.6786E-04	1.2611E-03	7.4798E-04	2.6786E-04	1.2611E-03	7.4798E-04	2.6786E-04	1.2611E-03	7.4798E-04			
6	2.251	8.7	1.963	50.4	5.906	150.0	-9.9	8.1478E-04	6.1273E-04	7.1375E-04	8.1478E-04	6.1273E-04	7.1375E-04	8.1478E-04	6.1273E-04	7.1375E-04	8.1478E-04	6.1273E-04	7.1375E-04			
17	2.240	9.2	1.996	50.7	5.915	150.2	-9.9	1.4092E-04	1.1786E-03	6.5976E-04	1.4092E-04	1.1786E-03	6.5976E-04	1.4092E-04	1.1786E-03	6.5976E-04	1.4092E-04	1.1786E-03	6.5976E-04			
Average	2.245	9.0	1.981	50.3	5.915	150.2	-10.0	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average			

indicates an instance of first failure
Ending horizontal deformation taken as the reading on the same line as maximum difference between vertical and horizontal deformation



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