ASPHALT TECHNOLOGIES, INC.

To: Federal Lands Highway Division February 16, 2009

From: Laurand Lewandowski
PRI Asphalt Technologies, Inc.

Subject: Test & Evaluation Report ; CRS-2LM, Utah Arches

PROPERTY			TEST METHOD	SPECIFICATION	RESULT
Asphalt Emulsion as Received					
TBD					
Evaporative Method Residue (24 hours @ 25°C, 24 hours @ 60°C, Forced Draft Oven)					
Residue by Evaporation, %			Draft Method	Report	70.2
Water Content, %			ASTM D 95		0.0
Frequency Sweep (25 mm, 0.1 – 100 rad/sec, 12% Strain)		70°C	AASHTO T 315		See Graph 1, Table 1
MSCR	% Rec (100 Pa)		TP 70-08		21.90
	J_{nr} (100 Pa) kPa^{-1}				1.81
	% Rec (1,000 Pa)				12.51
	J_{nr} (1,000 Pa) kPa^{-1}				2.11
	% Rec (3,200 Pa)				7.26
	J_{nr} (3,200 Pa) kPa^{-1}				2.52
	% Rec (10,000 Pa)				7.08
	J_{nr} (10,000 Pa) kPa^{-1}				2.89
Frequency Sweep (25 mm, 0.1 – 100 rad/sec, 12% Strain)		64°C	AASHTO T 315		See Graph 1, Table 2
MSCR	% Rec (100 Pa)		TP 70-08		21.94
	J_{nr} (100 Pa) kPa^{-1}				0.94
	% Rec (1,000 Pa)				17.59
	J_{nr} (1,000 Pa) kPa^{-1}				1.01
	% Rec (3,200 Pa)				10.14
	J_{nr} (3,200 Pa) kPa^{-1}				1.19
	% Rec (10,000 Pa)				9.39
	J_{nr} (10,000 Pa) kPa^{-1}				1.38
Frequency Sweep (25 mm, 0.1 – 100 rad/sec, 12% Strain)		58°C	AASHTO T 315		See Graph 1, Table 3
MSCR	% Rec (100 Pa)		TP 70-08		25.81
	J_{nr} (100 Pa) kPa^{-1}				0.45
	% Rec (1,000 Pa)				22.69
	J_{nr} (1,000 Pa) kPa^{-1}				0.46
	% Rec (3,200 Pa)				16.56
	J_{nr} (3,200 Pa) kPa^{-1}				0.52
	% Rec (10,000 Pa)				10.92
	J_{nr} (10,000 Pa) kPa^{-1}				0.63

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RESULTS: (Continued)

PRESSURE AGING RESIDUE (100°C, 300 psi, 20 hr.)					
Frequency Sweep (8 mm, 0.1 – 100 rad/sec, 5% Strain)		70°C	AASHTO T 315	Report	See Graph 2, Table 4
MSCR	% Rec (100 Pa)		TP 70-08		-
	J_{nr} (100 Pa) kPa^{-1}				-
	% Rec (1000 Pa)				23.67
	J_{nr} (1000 Pa) kPa^{-1}				0.75
	% Rec (3,200 Pa)				10.25
	J_{nr} (3,200 Pa) kPa^{-1}				1.05
	% Rec (10,000 Pa)				5.50
	J_{nr} (10,000 Pa) kPa^{-1}				1.52
Frequency Sweep (8 mm, 0.1 – 100 rad/sec, 5% Strain)		64°C	AASHTO T 315		See Graph 2, Table 5
MSCR	% Rec (100 Pa)		TP 70-08		-
	J_{nr} (100 Pa) kPa^{-1}				-
	% Rec (1000 Pa)				42.55
	J_{nr} (1000 Pa) kPa^{-1}				0.15
	% Rec (3,200 Pa)				31.42
	J_{nr} (3,200 Pa) kPa^{-1}				0.19
	% Rec (10,000 Pa)				19.80
	J_{nr} (10,000 Pa) kPa^{-1}				0.25
Frequency Sweep (8 mm, 0.1 – 100 rad/sec, 5% Strain)		58°C	AASHTO T 315		See Graph 2, Table 6
MSCR	% Rec (100 Pa)		TP 70-08		-
	J_{nr} (100 Pa) kPa^{-1}				-
	% Rec (1000 Pa)				44.00
	J_{nr} (1000 Pa) kPa^{-1}				0.06
	% Rec (3,200 Pa)				43.24
	J_{nr} (3,200 Pa) kPa^{-1}				0.06
	% Rec (10,000 Pa)				36.61
	J_{nr} (10,000 Pa) kPa^{-1}				0.07
Frequency Sweep (8 mm, 0.1 – 100 rad/sec, 1% Strain)		10°C	AASHTO T 315		See Graph 3, Table 7
Frequency Sweep (8 mm, 0.1 – 100 rad/sec, 1% Strain)		20°C			See Graph 3, Table 8
Strain Sweep (8 mm, 1 – 50 % Strain, 10 rad/sec		25°C	New Method		See Graph 4, Table 9
Creep Stiffness	Stiffness, MPA (60 sec.)	-18°C	AASHTO T 313	300 max.	315
	m- Value			0.300 min.	0.282
	Stiffness, MPA (60 sec.)	-12°C		300 max.	142
	m- Value			300 min.	0.348

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Graph 1: Frequency Sweep on Residue (58°C, 64°C & 70°C)

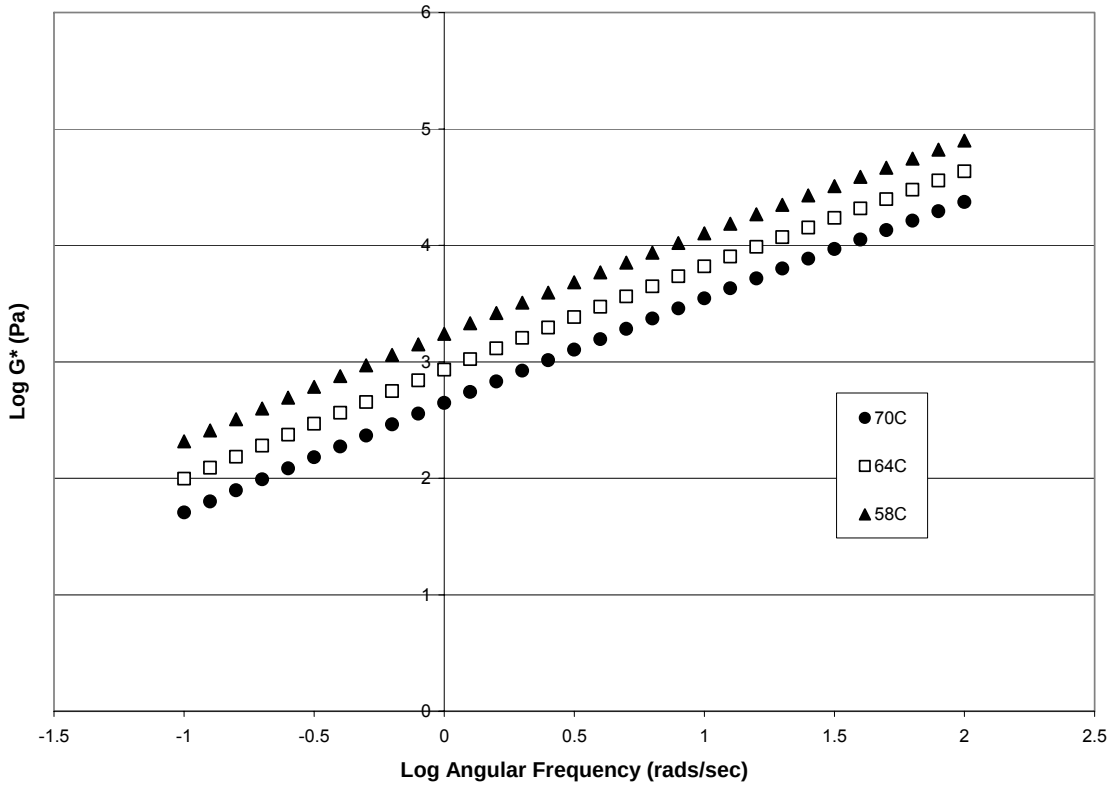

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Table 1. **Frequency Sweep on Residue (25 mm plates, 2 mm gap, 12% strain (0. 1 to 100 rad/sec))**

ang. frequency	delta	G'	G''	|G*|	strain	temperature
rad/sec	degrees	Pa	Pa	Pa		°C
0.1	86.25	3.32	50.73	50.84	0.11936	70
0.1259	86.04	4.371	63.2	63.35	0.11987	70
0.1585	85.81	5.761	78.66	78.87	0.11986	70
0.1995	85.56	7.592	97.7	98	0.11982	70
0.2512	85.31	9.952	121.3	121.7	0.11981	70
0.3162	85.02	13.14	150.7	151.3	0.11975	70
0.3981	84.7	17.34	187	187.8	0.11973	70
0.5012	84.38	22.84	231.9	233	0.11966	70
0.631	84.05	30.01	288.1	289.7	0.11964	70
0.7943	83.67	39.57	356.9	359.1	0.11954	70
1	83.27	52.11	441.3	444.3	0.11951	70
1.259	82.86	68.31	545.5	549.8	0.1194	70
1.585	82.42	89.66	673.4	679.4	0.11937	70
1.995	81.96	117.2	830.3	838.5	0.11924	70
2.512	81.48	153.1	1023	1034	0.1192	70
3.162	80.98	199.6	1258	1273	0.11906	70
3.981	80.45	259.5	1543	1564	0.11904	70
5.012	79.92	335.8	1890	1919	0.11891	70
6.31	79.37	433.3	2310	2350	0.1189	70
7.943	78.83	556.7	2820	2874	0.11883	70
10	78.28	712.9	3436	3510	0.11881	70
12.59	77.75	908.2	4182	4279	0.11883	70
15.85	77.22	1153	5083	5212	0.11882	70
19.95	76.72	1454	6162	6331	0.11899	70
25.12	76.23	1827	7456	7677	0.11904	70
31.62	75.8	2280	9007	9291	0.11932	70
39.81	75.37	2835	10860	11220	0.11942	70
50.12	75.04	3496	13090	13540	0.11977	70
63.1	74.73	4297	15740	16320	0.12022	70
79.43	74.48	5250	18910	19630	0.12021	70
100	74.33	6370	22710	23590	0.12065	70

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Table 2. **Frequency Sweep on Residue (25 mm plates, 2 mm gap, 12% strain (0. 1 to 100 rad/sec))**

ang. frequency	delta	G'	G''	|G*|	strain	temperature
rad/sec	degrees	Pa	Pa	Pa		°C
0.1	85.86	7.151	98.84	99.1	0.11834	64
0.1259	85.62	9.395	122.8	123.1	0.11982	64
0.1585	85.39	12.3	152.5	153	0.11977	64
0.1995	85.12	16.2	189.6	190.3	0.11975	64
0.2512	84.8	21.43	235.7	236.7	0.11968	64
0.3162	84.49	28.23	292.6	294	0.11966	64
0.3981	84.14	37.2	362.3	364.2	0.11958	64
0.5012	83.79	48.84	448.7	451.3	0.11956	64
0.631	83.42	64.1	555.4	559.1	0.11944	64
0.7943	83.02	83.97	686.1	691.3	0.11942	64
1	82.57	110.6	848.2	855.4	0.11926	64
1.259	82.13	144.6	1046	1056	0.11924	64
1.585	81.65	189.2	1289	1302	0.11909	64
1.995	81.15	246.7	1584	1604	0.11905	64
2.512	80.63	320.8	1945	1971	0.11892	64
3.162	80.09	416.8	2385	2421	0.11885	64
3.981	79.52	540.1	2920	2969	0.11874	64
5.012	78.97	695.6	3567	3634	0.11872	64
6.31	78.4	893	4349	4439	0.1187	64
7.943	77.83	1143	5299	5421	0.11864	64
10	77.3	1451	6439	6600	0.11874	64
12.59	76.74	1841	7809	8023	0.11873	64
15.85	76.22	2317	9446	9727	0.11898	64
19.95	75.73	2903	11410	11770	0.11899	64
25.12	75.26	3621	13760	14230	0.11928	64
31.62	74.83	4497	16590	17190	0.11959	64
39.81	74.45	5560	19980	20740	0.11945	64
50.12	74.09	6842	24000	24950	0.11992	64
63.1	73.79	8371	28790	29980	0.12036	64
79.43	73.53	10210	34540	36010	0.12015	64
100	73.34	12380	41380	43190	0.12061	64

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Table 3. **Frequency Sweep on Residue (25 mm plates, 2 mm gap, 12% strain (0. 1 to 100 rad/sec))**

Angular Freq	delta	G'	G''	|G*|	strain	temperature
rad/sec	degrees	Pa	Pa	Pa		°C
0.1	85.07	17.85	207.1	207.8	0.11479	58
0.1259	84.78	23.46	256.8	257.8	0.1197	58
0.1585	84.41	31.25	319.5	321	0.11959	58
0.1995	84.04	41.35	395.8	398	0.11958	58
0.2512	83.65	54.52	489.8	492.8	0.11948	58
0.3162	83.22	72.04	605.9	610.1	0.11943	58
0.3981	82.79	94.71	748.1	754.1	0.11931	58
0.5012	82.33	124.5	924	932.3	0.11926	58
0.631	81.85	162.9	1137	1149	0.11914	58
0.7943	81.35	212.8	1399	1415	0.11909	58
1	80.82	277.7	1719	1741	0.11892	58
1.259	80.28	361.5	2111	2141	0.11886	58
1.585	79.73	468.7	2586	2628	0.11873	58
1.995	79.18	604.8	3164	3221	0.1187	58
2.512	78.61	777.4	3859	3937	0.11864	58
3.162	78.04	996.3	4705	4809	0.11856	58
3.981	77.48	1270	5720	5859	0.11861	58
5.012	76.94	1611	6942	7126	0.11859	58
6.31	76.39	2036	8409	8652	0.1187	58
7.943	75.88	2558	10170	10480	0.1187	58
10	75.38	3203	12280	12690	0.11891	58
12.59	74.91	3990	14800	15330	0.11892	58
15.85	74.47	4954	17830	18500	0.11918	58
19.95	74.06	6123	21430	22290	0.11956	58
25.12	73.67	7545	25750	26840	0.11932	58
31.62	73.33	9255	30910	32260	0.11969	58
39.81	73.02	11310	37050	38740	0.12008	58
50.12	72.74	13780	44330	46420	0.1199	58
63.1	72.48	16740	53010	55590	0.12021	58
79.43	72.25	20250	63290	66450	0.1206	58
100	72.08	24400	75460	79310	0.12039	58

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Graph 2: Frequency Sweep on PAV Residue (58°C, 64°C & 70°C)

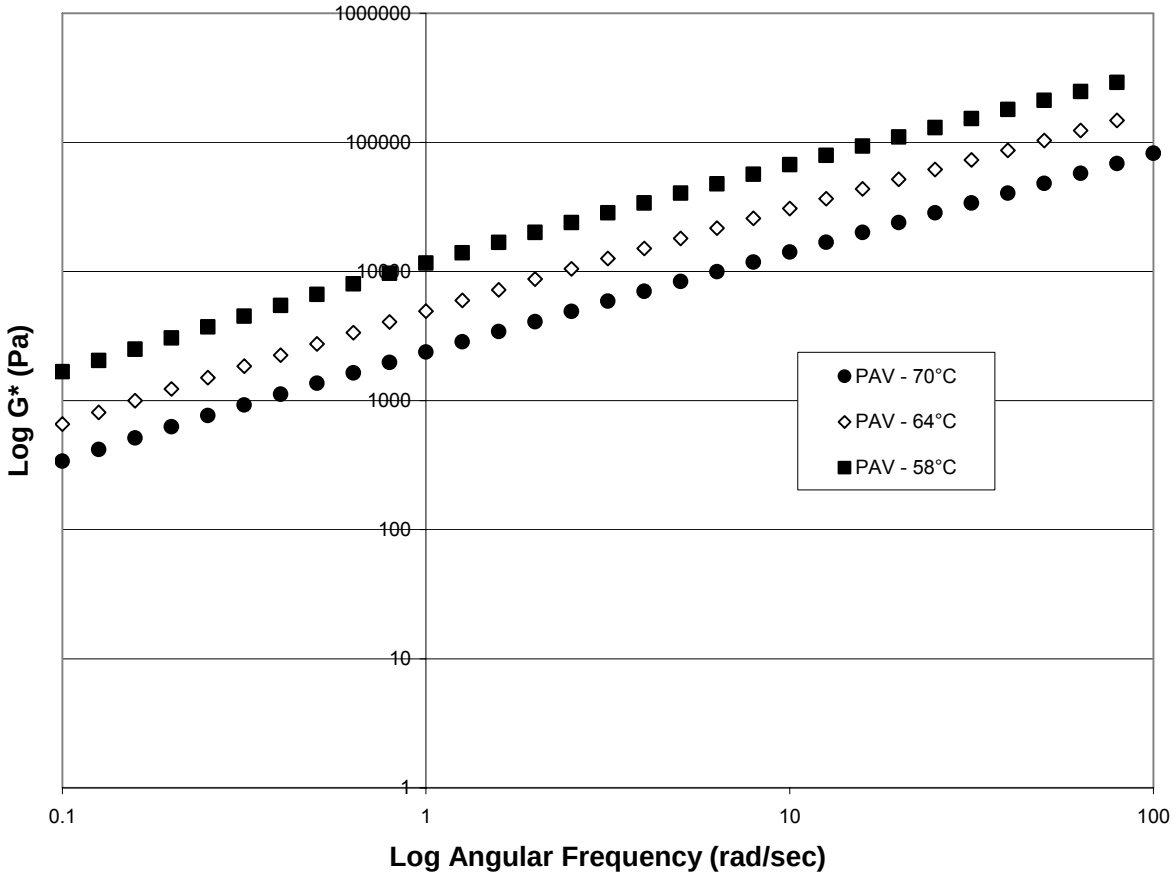

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Table 4. **Frequency Sweep on PAV Residue (8 mm plates, 2 mm gap, 5% strain (0. 1 to 100 rad/sec))**

ang. frequency	delta	frequency	G'	G''	|G*|	% strain	temperature
rad/sec	degrees	Hz	Pa	Pa	Pa		°C
0.1	86.53	0.01592	20.48	337.9	338.5	4.9993	70
0.1259	86.47	0.02004	25.65	416.4	417.2	4.9994	70
0.1585	86.27	0.02522	33.3	511	512.1	4.9991	70
0.1995	85.88	0.03176	45.03	625.1	626.7	4.9986	70
0.2512	85.45	0.03998	60.8	763.2	765.6	4.9982	70
0.3162	85.07	0.05033	79.49	921.6	925	4.9983	70
0.3981	84.33	0.06336	110.8	1116	1121	4.9972	70
0.5012	83.96	0.07977	143.4	1357	1364	4.9975	70
0.631	83.38	0.1004	188.6	1625	1636	4.9969	70
0.7943	82.81	0.1264	247.3	1960	1976	4.9957	70
1	82.09	0.1592	326.9	2354	2376	4.9953	70
1.259	81.37	0.2004	428.3	2821	2854	4.9945	70
1.585	80.59	0.2522	559.5	3375	3421	4.9932	70
1.995	79.72	0.3176	728.8	4018	4084	4.9933	70
2.512	78.95	0.3998	941.3	4820	4911	4.9918	70
3.162	78.07	0.5033	1215	5754	5881	4.9898	70
3.981	77.12	0.6336	1563	6834	7010	4.9905	70
5.012	76.23	0.7977	1990	8120	8360	4.9886	70
6.31	75.32	1.004	2521	9623	9948	4.9875	70
7.943	74.41	1.264	3179	11390	11830	4.9882	70
10	73.55	1.592	3992	13520	14100	4.9869	70
12.59	72.65	2.004	5016	16060	16820	4.9853	70
15.85	71.88	2.522	6230	19030	20030	4.9878	70
19.95	71.07	3.176	7744	22580	23870	4.9879	70
25.12	70.26	3.998	9622	26820	28490	4.9897	70
31.62	69.4	5.033	11950	31780	33950	4.9924	70
39.81	68.45	6.336	14840	37580	40410	4.9999	70
50.12	67.4	7.977	18510	44470	48170	5.0082	70
63.1	66.3	10.04	23160	52770	57630	5.0087	70
79.43	65.16	12.64	28850	62320	68670	5.0246	70
100	63.03	15.92	37390	73490	82450	5.0393	70

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Table 5. **Frequency Sweep on PAV Residue (8 mm plates, 2 mm gap, 5% strain (0. 1 to 100 rad/sec))**

ang. frequency	delta	frequency	G'	G''	|G*|	|n*|	% strain	temperature
rad/sec	degrees	Hz	Pa	Pa	Pa	Pa.s		°C
0.1	81.16	0.01592	82	527.3	533.7	5337	4.9975	64
0.1259	81.03	0.02004	102.5	649.5	657.5	5223	4.9977	64
0.1585	80.69	0.02522	131	799	809.6	5109	4.9968	64
0.1995	80.24	0.03176	169	982.3	996.7	4996	4.9965	64
0.2512	79.73	0.03998	218.8	1208	1228	4888	4.9955	64
0.3162	79.18	0.05033	282	1475	1502	4749	4.9953	64
0.3981	78.59	0.06336	364.3	1805	1842	4626	4.994	64
0.5012	77.99	0.07977	468	2199	2248	4486	4.9938	64
0.631	77.3	0.1004	603.9	2680	2747	4354	4.992	64
0.7943	76.62	0.1264	774.9	3257	3347	4214	4.9918	64
1	75.93	0.1592	988.2	3943	4065	4065	4.9901	64
1.259	75.22	0.2004	1257	4764	4927	3914	4.9895	64
1.585	74.48	0.2522	1596	5746	5963	3763	4.9872	64
1.995	73.79	0.3176	2012	6920	7207	3612	4.9884	64
2.512	73.06	0.3998	2538	8333	8711	3468	4.984	64
3.162	72.34	0.5033	3180	9989	10480	3315	4.9813	64
3.981	71.63	0.6336	3961	11930	12570	3157	4.9831	64
5.012	70.93	0.7977	4927	14250	15080	3009	4.9798	64
6.31	70.23	1.004	6101	16980	18040	2859	4.9775	64
7.943	69.56	1.264	7545	20250	21610	2720	4.9787	64
10	68.91	1.592	9276	24060	25780	2578	4.9772	64
12.59	68.22	2.004	11420	28570	30770	2444	4.9749	64
15.85	67.53	2.522	13990	33820	36600	2309	4.978	64
19.95	66.82	3.176	17130	40010	43530	2182	4.9774	64
25.12	66.07	3.998	21000	47320	51770	2061	4.9793	64
31.62	65.23	5.033	25800	55900	61570	1947	4.9813	64
39.81	64.26	6.336	31750	65860	73110	1836	4.9879	64
50.12	63.16	7.977	39220	77500	86860	1733	4.9975	64
63.1	61.83	10.04	48830	91190	1.03E+05	1640	5.0002	64
79.43	60.36	12.64	61030	1.07E+05	1.23E+05	1554	5.0172	64
100	58.16	15.92	78040	1.26E+05	1.48E+05	1479	5.0418	64

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Table 6. **Frequency Sweep on PAV Residue (8 mm plates, 2 mm gap, 5% strain (0. 1 to 100 rad/sec))**

ang. frequency	delta	frequency	G'	G''	|G*|	% strain	temperature
rad/sec	degrees	Hz	Pa	Pa	Pa		°C
0.1	79.6	0.01592	246.9	1345	1368	4.9924	58
0.1259	79.02	0.02004	318.7	1643	1674	4.995	58
0.1585	78.42	0.02522	410.8	2004	2046	4.9936	58
0.1995	77.78	0.03176	529.4	2444	2501	4.9933	58
0.2512	77.12	0.03998	680.3	2976	3052	4.9915	58
0.3162	76.46	0.05033	869.8	3611	3715	4.9913	58
0.3981	75.74	0.06336	1110	4370	4509	4.9891	58
0.5012	75.05	0.07977	1410	5280	5465	4.9888	58
0.631	74.35	0.1004	1789	6384	6630	4.9861	58
0.7943	73.64	0.1264	2258	7693	8017	4.9858	58
1	72.91	0.1592	2836	9228	9654	4.9825	58
1.259	72.23	0.2004	3542	11060	11610	4.9795	58
1.585	71.53	0.2522	4417	13220	13940	4.9808	58
1.995	70.87	0.3176	5485	15810	16740	4.9771	58
2.512	70.2	0.3998	6793	18860	20050	4.9732	58
3.162	69.57	0.5033	8337	22380	23880	4.9759	58
3.981	68.94	0.6336	10230	26570	28470	4.9718	58
5.012	68.36	0.7977	12510	31550	33940	4.9677	58
6.31	67.78	1.004	15250	37320	40310	4.9707	58
7.943	67.23	1.264	18490	44060	47780	4.9681	58
10	66.7	1.592	22380	51980	56590	4.9655	58
12.59	66.18	2.004	27100	61380	67100	4.9674	58
15.85	65.66	2.522	32680	72240	79290	4.9675	58
19.95	65.15	3.176	39290	84840	93500	4.9696	58
25.12	64.65	3.998	47210	99640	1.10E+05	4.9723	58
31.62	64.1	5.033	56790	1.17E+05	1.30E+05	4.9759	58
39.81	63.51	6.336	68140	1.37E+05	1.53E+05	4.9881	58
50.12	62.86	7.977	81880	1.60E+05	1.80E+05	4.9906	58
63.1	62.13	10.04	98780	1.87E+05	2.11E+05	5.0026	58
79.43	61.32	12.64	1.19E+05	2.18E+05	2.48E+05	5.0267	58
100	60.11	15.92	1.45E+05	2.53E+05	2.91E+05	5.0314	58

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Graph 3. **Intermediate Temperature Frequency Sweep on PAV Residue (8 mm plates, 2 mm gap, 5% strain (0. 1 to 100 rad/sec))**

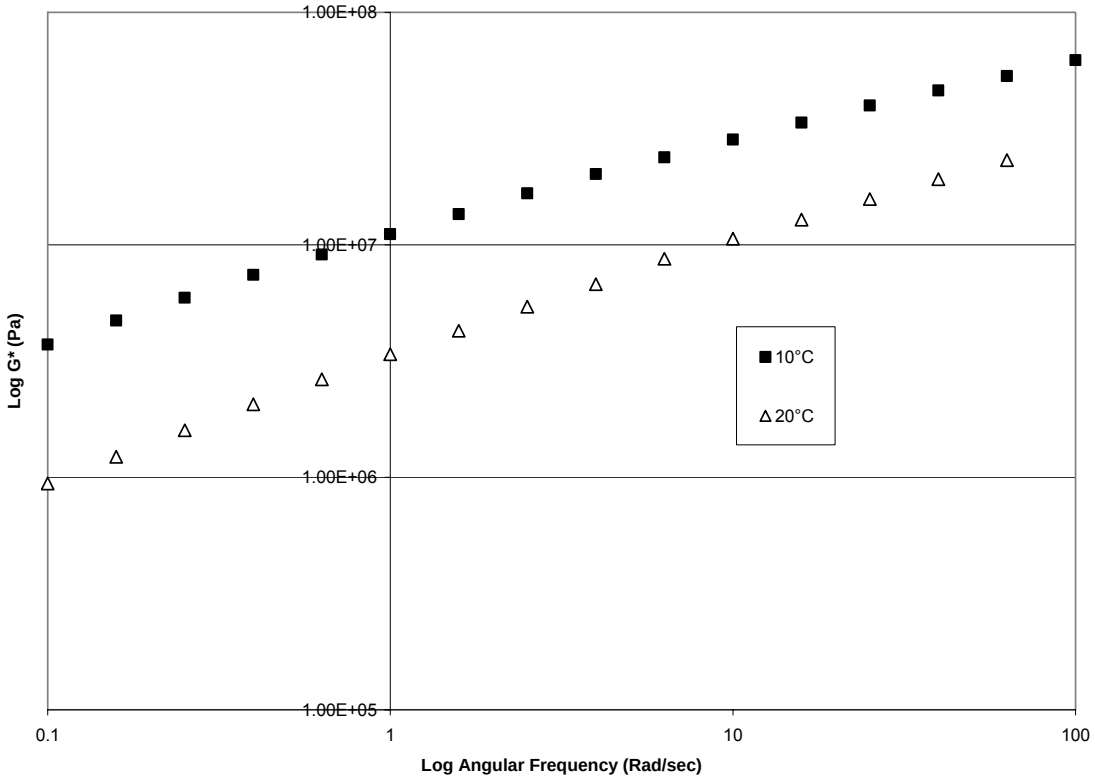

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Table 7. **Intermediate Temperature Frequency Sweep on PAV Residue (8 mm plates, 2 mm gap, 5% strain (0. 1 to 100 rad/sec))**

ang. frequency	delta	frequency	G'	G''	|G*|	% strain	temperature
rad/sec	degrees	Hz	Pa	Pa	Pa		°C
0.1	48.45	0.01592	2.47E+06	2.79E+06	3.72E+06	1.0102	10
0.1585	46.38	0.02522	3.26E+06	3.42E+06	4.72E+06	0.97606	10
0.2512	44.3	0.03998	4.24E+06	4.14E+06	5.92E+06	0.98131	10
0.3981	43.14	0.06336	5.41E+06	5.07E+06	7.42E+06	0.97636	10
0.631	42.59	0.1004	6.68E+06	6.14E+06	9.08E+06	0.99379	10
1	40.82	0.1592	8.41E+06	7.26E+06	1.11E+07	0.98618	10
1.585	39.81	0.2522	1.04E+07	8.68E+06	1.36E+07	0.98609	10
2.512	37.95	0.3998	1.31E+07	1.02E+07	1.66E+07	0.97361	10
3.981	37.19	0.6336	1.60E+07	1.22E+07	2.01E+07	0.97955	10
6.31	36.15	1.004	1.92E+07	1.40E+07	2.38E+07	0.99044	10
10	35.12	1.592	2.32E+07	1.63E+07	2.84E+07	0.9794	10
15.85	34.15	2.522	2.78E+07	1.88E+07	3.36E+07	0.98094	10
25.12	33.14	3.998	3.33E+07	2.17E+07	3.98E+07	0.96983	10
39.81	32.26	6.336	3.90E+07	2.46E+07	4.62E+07	0.97955	10
63.1	31.44	10.04	4.54E+07	2.78E+07	5.32E+07	0.98081	10
100	30.51	15.92	5.36E+07	3.16E+07	6.22E+07	0.9607	10

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Table 8. **Intermediate Temperature Frequency Sweep on PAV Residue (8 mm plates, 2 mm gap, 5% strain (0. 1 to 100 rad/sec))**

ang. frequency	delta	frequency	G'	G''	|G*|	% strain	temperature
rad/sec	degrees	Hz	Pa	Pa	Pa		°C
0.1	55.21	0.01592	4.15E+05	5.97E+05	7.27E+05	0.99889	20
0.1585	53.93	0.02522	5.55E+05	7.61E+05	9.42E+05	0.9736	20
0.2512	52.85	0.03998	7.40E+05	9.77E+05	1.23E+06	0.97305	20
0.3981	51.54	0.06336	9.91E+05	1.25E+06	1.59E+06	0.96976	20
0.631	50.21	0.1004	1.32E+06	1.58E+06	2.06E+06	0.97336	20
1	49.11	0.1592	1.73E+06	2.00E+06	2.64E+06	0.97422	20
1.585	47.98	0.2522	2.27E+06	2.52E+06	3.39E+06	0.97645	20
2.512	46.38	0.3998	2.94E+06	3.09E+06	4.27E+06	0.97997	20
3.981	45.4	0.6336	3.81E+06	3.86E+06	5.42E+06	0.97766	20
6.31	44.24	1.004	4.85E+06	4.73E+06	6.78E+06	0.9827	20
10	42.91	1.592	6.37E+06	5.92E+06	8.70E+06	0.96628	20
15.85	41.87	2.522	7.91E+06	7.09E+06	1.06E+07	0.9949	20
25.12	40.89	3.998	9.71E+06	8.41E+06	1.28E+07	1.0032	20
39.81	39.81	6.336	1.21E+07	1.01E+07	1.57E+07	0.98933	20
63.1	38.75	10.04	1.49E+07	1.20E+07	1.92E+07	0.9951	20
100	37.73	15.92	1.83E+07	1.42E+07	2.31E+07	0.99877	20

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Graph 4. **Strain Sweep on PAV Residue**
(8 mm plates, 2 mm gap, 0.01% - 50% strain (10 rad/sec))

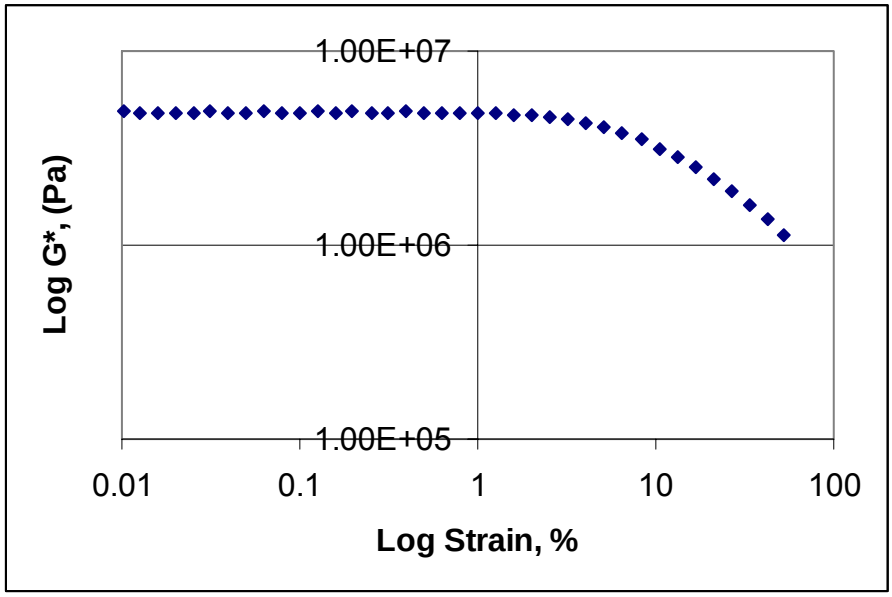

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Table 9. Strain Sweep on PAV Residue (8 mm plates, 2 mm gap, 0.01% - 50% strain (10 rad/sec))

delta	frequency	G'	G''	|G*|	% strain	temperature
degrees	Hz	Pa	Pa	Pa		°C
47.96	1.592	3.26E+06	3.61E+06	4.87E+06	0.010151	25
46.7	1.592	3.32E+06	3.52E+06	4.84E+06	0.01255	25
46.71	1.592	3.32E+06	3.53E+06	4.85E+06	0.015787	25
46.69	1.592	3.32E+06	3.53E+06	4.85E+06	0.019891	25
46.73	1.592	3.32E+06	3.52E+06	4.84E+06	0.025152	25
46.7	1.592	3.33E+06	3.54E+06	4.86E+06	0.031432	25
46.67	1.592	3.32E+06	3.52E+06	4.84E+06	0.03978	25
46.69	1.592	3.33E+06	3.53E+06	4.85E+06	0.049991	25
46.66	1.592	3.34E+06	3.54E+06	4.86E+06	0.062698	25
46.71	1.592	3.30E+06	3.51E+06	4.82E+06	0.079535	25
46.68	1.592	3.33E+06	3.53E+06	4.85E+06	0.099361	25
46.65	1.592	3.33E+06	3.53E+06	4.85E+06	0.12536	25
46.69	1.592	3.31E+06	3.51E+06	4.83E+06	0.1584	25
46.66	1.592	3.33E+06	3.53E+06	4.85E+06	0.19838	25
46.68	1.592	3.33E+06	3.53E+06	4.85E+06	0.25142	25
46.7	1.592	3.32E+06	3.52E+06	4.84E+06	0.31552	25
46.7	1.592	3.34E+06	3.54E+06	4.87E+06	0.39545	25
46.74	1.592	3.31E+06	3.52E+06	4.84E+06	0.50227	25
46.77	1.592	3.31E+06	3.53E+06	4.84E+06	0.62787	25
46.83	1.592	3.30E+06	3.52E+06	4.83E+06	0.79302	25
46.94	1.592	3.27E+06	3.50E+06	4.79E+06	1.0013	25
47.05	1.592	3.26E+06	3.50E+06	4.78E+06	1.2563	25
47.28	1.592	3.20E+06	3.47E+06	4.72E+06	1.5915	25
47.56	1.592	3.15E+06	3.45E+06	4.67E+06	2.0021	25
48.04	1.592	3.05E+06	3.39E+06	4.56E+06	2.5508	25
48.65	1.592	2.94E+06	3.34E+06	4.44E+06	3.2001	25
49.48	1.592	2.78E+06	3.25E+06	4.27E+06	4.0615	25
50.59	1.592	2.57E+06	3.13E+06	4.05E+06	5.1684	25
51.88	1.592	2.34E+06	2.98E+06	3.79E+06	6.5194	25
53.37	1.592	2.08E+06	2.79E+06	3.48E+06	8.2838	25
54.97	1.592	1.81E+06	2.59E+06	3.16E+06	10.476	25
56.54	1.592	1.56E+06	2.36E+06	2.82E+06	13.321	25
58.03	1.592	1.33E+06	2.12E+06	2.50E+06	16.773	25
59.45	1.592	1.11E+06	1.89E+06	2.19E+06	21.126	25
60.73	1.592	9.31E+05	1.66E+06	1.90E+06	26.512	25
62	1.592	7.60E+05	1.43E+06	1.62E+06	33.793	25
63.02	1.592	6.21E+05	1.22E+06	1.37E+06	42.238	25
64.15	1.592	4.93E+05	1.02E+06	1.13E+06	52.97	25

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