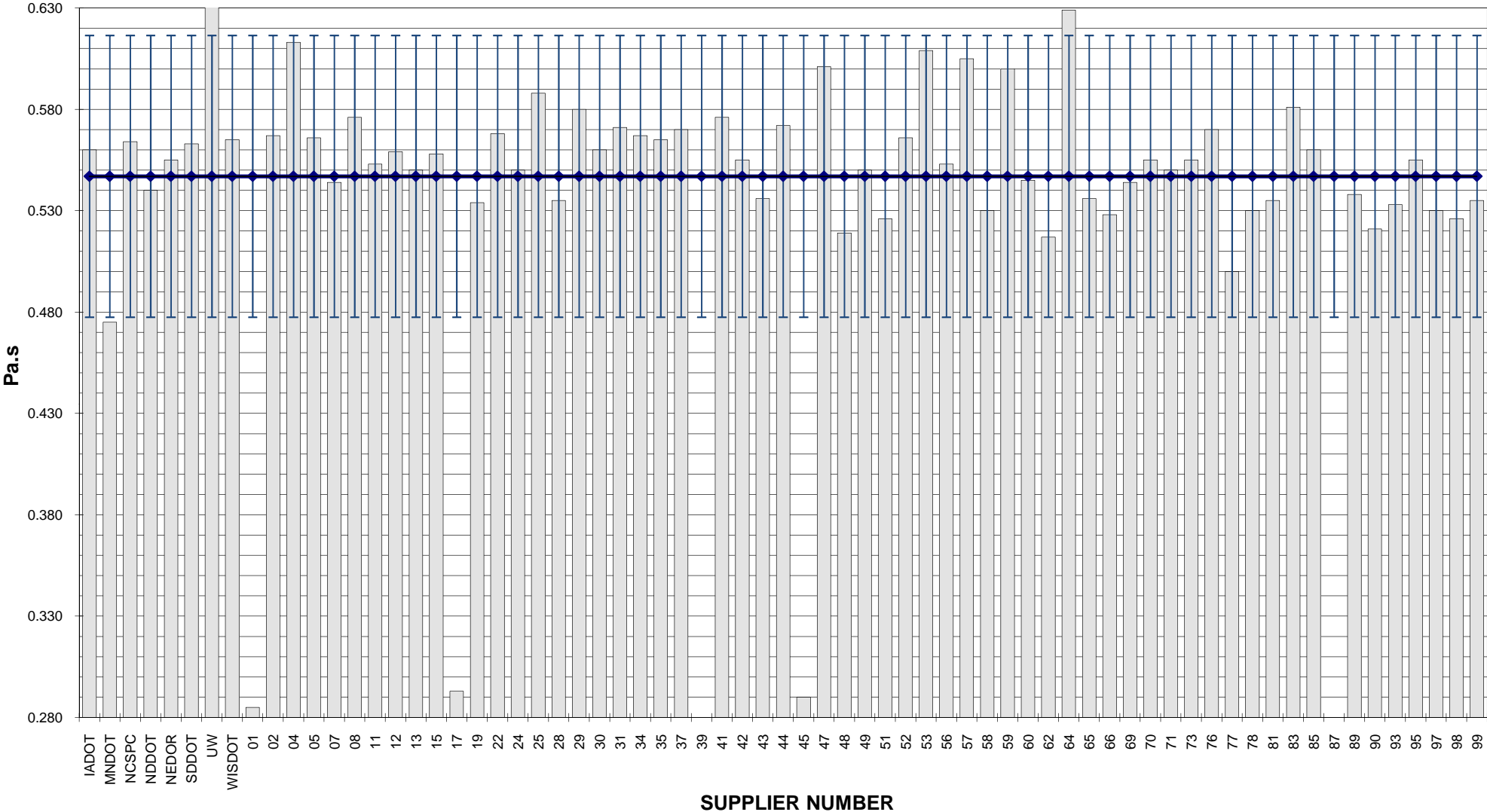


**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1**  
**SUMMARY A**  
**PG 64-28**

Supplier Number	Rotational Viscosity (Pa.s) @135°C	DSR Original (kPa) @64°C	DSR RTFO (kPa) @64°C	DSR PAV (kPa) @22°C	Mass Loss (%) @163°C	BBR S-value (MPa) @-18°C	BBR m-value @-18°C	Strain (%) @-18°C	DTT Stress (MPa) @-18°C	CRITICAL CRACK TEMP (°C)	MSCR % RECOVERY @ 100Pa	MSCR % RECOVERY @ 3200Pa
IADOT	0.560	1.33	3.00	2910	-0.243	230	0.310				31.67	14.44
MNDOT	0.475	1.33	3.48	3867	-0.316	229	0.303				35.78	19.17
NCSPC	0.564	1.33	3.08	2260	-0.310	224	0.318				32.49	14.04
NDDOT	0.540	1.33	3.06	2712	-0.257	224	0.316				33.88	15.48
NEDOR	0.555	1.40	3.14	3086	-0.202	241	0.312				33.18	16.02
SDDOT	0.563	1.33	3.20	2832	-0.259	240	0.329				34.31	16.85
UW	0.812	1.38	3.41	3260	-1.420	262	0.301					
WISDOT	0.565	1.33	2.78	2442	-0.285	219	0.307					
01	0.285	1.33	3.37	3511	-0.177	218	0.326				33.46	17.00
02	0.567	1.43	2.91	3091	-0.321	256	0.315				29.84	13.19
04	0.613	1.37	3.06	3209	-0.230	244	0.313					
05	0.566	1.27	3.14	2785	-0.285	230	0.308				32.70	16.49
07	0.544	1.35	2.91	3119	-0.249	234	0.319				29.41	14.25
08	0.576	1.29	3.01	2775	-0.260	229	0.308				31.95	16.33
11	0.553	1.41	3.00	3199	-0.320	257	0.312				31.56	14.42
12	0.559	1.33	2.88	2841	-0.266	234	0.313					
13	0.550	1.26	3.37	3370	-0.231	234	0.325	1.18	4.11	-29.4	34.42	16.78
15	0.558	1.26	2.99	2942	-0.228	232	0.313				32.16	15.23
17	0.293	1.37	3.19	3347	-0.203	223	0.324				32.85	16.25
19	0.534	1.26	3.13	3104	-0.358	245	0.317				35.87	19.10
22	0.568	1.35	2.98	3172	-0.269	227	0.309				32.31	16.61
24	0.550	1.32	3.22	3010	-0.278	234	0.312	1.22	4.00	-28.5	33.01	14.86
25	0.588	1.31	3.09	3571	-0.298	244	0.315				33.99	15.86
28	0.535	1.32	2.87	2853	-0.256	253	0.302				29.14	13.67
29	0.580	1.22	2.39	3084	-0.330	224	0.326				26.80	10.50
30	0.560	1.38	3.36	3124	-0.227	234	0.329					
31	0.571	1.30	3.14	2998	-0.295	226	0.311				32.58	16.57
34	0.567	1.36	3.34	2860	-0.237	253	0.315				34.46	17.07
35	0.565	1.38	3.19	3000	-0.225	271	0.301					
37	0.570	1.30	2.66	2709	-0.244	245	0.308	1.25	4.32	-28.30	31.49	13.66
39												
41	0.576	1.27	3.02	2988	-0.269	225	0.311				31.74	16.12
42	0.555	1.28	3.04	2950	-0.313	232	0.312					
43	0.536	1.37	3.12	3020	-0.240	250	0.317				32.50	15.11
44	0.572	1.31	3.16	2964	-0.278	232	0.307				32.39	16.77
45	0.290	1.36	3.26	3226	-0.205	218	0.315				32.72	16.59
47	0.601	1.34	3.12	3239	-0.222	240	0.314					
48	0.519	1.41	3.21	2927	-0.234	261	0.314				34.27	16.80
49	0.550	1.32	3.23	2960	-0.262	244	0.314				33.36	16.14
51	0.526	1.23	3.14	3000	-0.300	241	0.317				35.10	16.63
52	0.566	1.29	3.09	2971	-0.275	233	0.310				32.26	16.23
53	0.609	1.39	3.15	2878	-0.290	237	0.302					
56	0.553	1.35	3.28	2832	-0.271	247	0.307				34.22	17.10
57	0.605	1.33	3.05	3173	-0.238	236	0.312					
58	0.530	1.33	3.03	3190	-0.293	236	0.312				31.90	14.68
59	0.600	1.30	3.13	3570	-0.300	244	0.315				34.91	16.80
60	0.545	1.32	2.69	3210	-0.255	238	0.313					
62	0.517	1.39	3.34	2922	-0.275	249	0.311				34.29	17.52
64	0.629	1.37	3.08	2978	-0.250	239	0.299					
65	0.536	1.34	3.13	3209	-0.253	215	0.322				25.60	15.00
66	0.528	1.31	3.20	3030	-0.269	258	0.305				31.53	16.56
69	0.544	1.32	2.96	3162	-0.243	229	0.315	2.20	5.77	-30.50	29.42	14.77
70	0.555	1.32	2.88	3000	-0.206	247	0.313				34.42	17.84
71	0.550	1.44	3.55	2665	-0.235	248	0.322					
73	0.555	1.35	3.11	2856	-0.255	242	0.330					
76	0.570	1.34	3.43	2915	-0.230	235	0.322					
77	0.500	1.42	3.40	3270	-0.253	232	0.309				32.19	14.66
78	0.530	1.30	3.03	2885	-0.296	227	0.313				32.63	15.61
81	0.535	1.30	3.07	3210	-0.309	237	0.314				33.79	16.66
83	0.581	1.29	3.13	2862	-0.290	227	0.311				33.11	16.96
85	0.560	1.32	3.36	3141	-0.234	240	0.316					
87												
89	0.538	1.19	2.93	2556	-0.215	234	0.315				32.01	14.87
90	0.521	1.29	3.16	3041	-0.231	262	0.306				34.25	16.55
93	0.533	1.23	3.15	2967	-0.227	232	0.323	1.28	4.18	-29.40	35.73	16.97
95	0.555	1.37	3.32	3188	-0.230	235	0.312					
97	0.530	1.25	3.07	3005	-0.298	244	0.321				34.46	17.51
98	0.526	1.25	3.15	3040	-0.263	247	0.322				33.44	16.63
99	0.535	1.27	3.15	2879	-0.277	261	0.304				30.16	15.82
<b>Average</b>	0.547	1.33	3.11	3029	-0.279	238	0.314	1.43	4.48	-29.22	32.63	15.93
<b>Std. Dev.</b>	0.0695	0.0519	0.1969	253.79	0.1460	12.0839	0.0071	0.4343	0.7326	0.8758	2.0843	1.5025
<b>Coef. of Var.</b>	12.705	3.920	6.323	8.380	52.400	5.070	2.254	30.453	16.368	-2.997	6.387	9.429

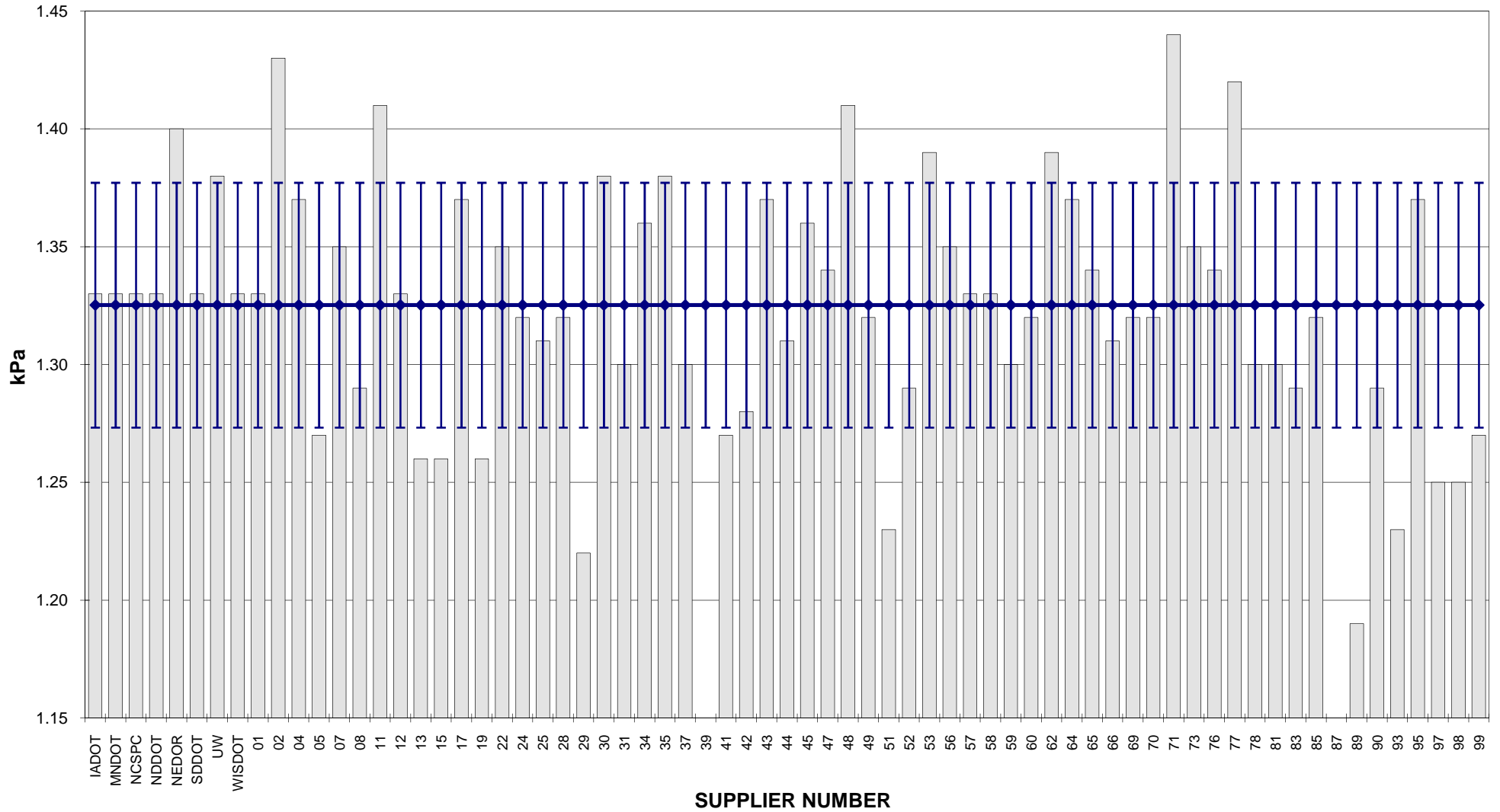
**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1  
SUMMARY A  
PG 64-28**

**ROTATIONAL VISCOSITY**



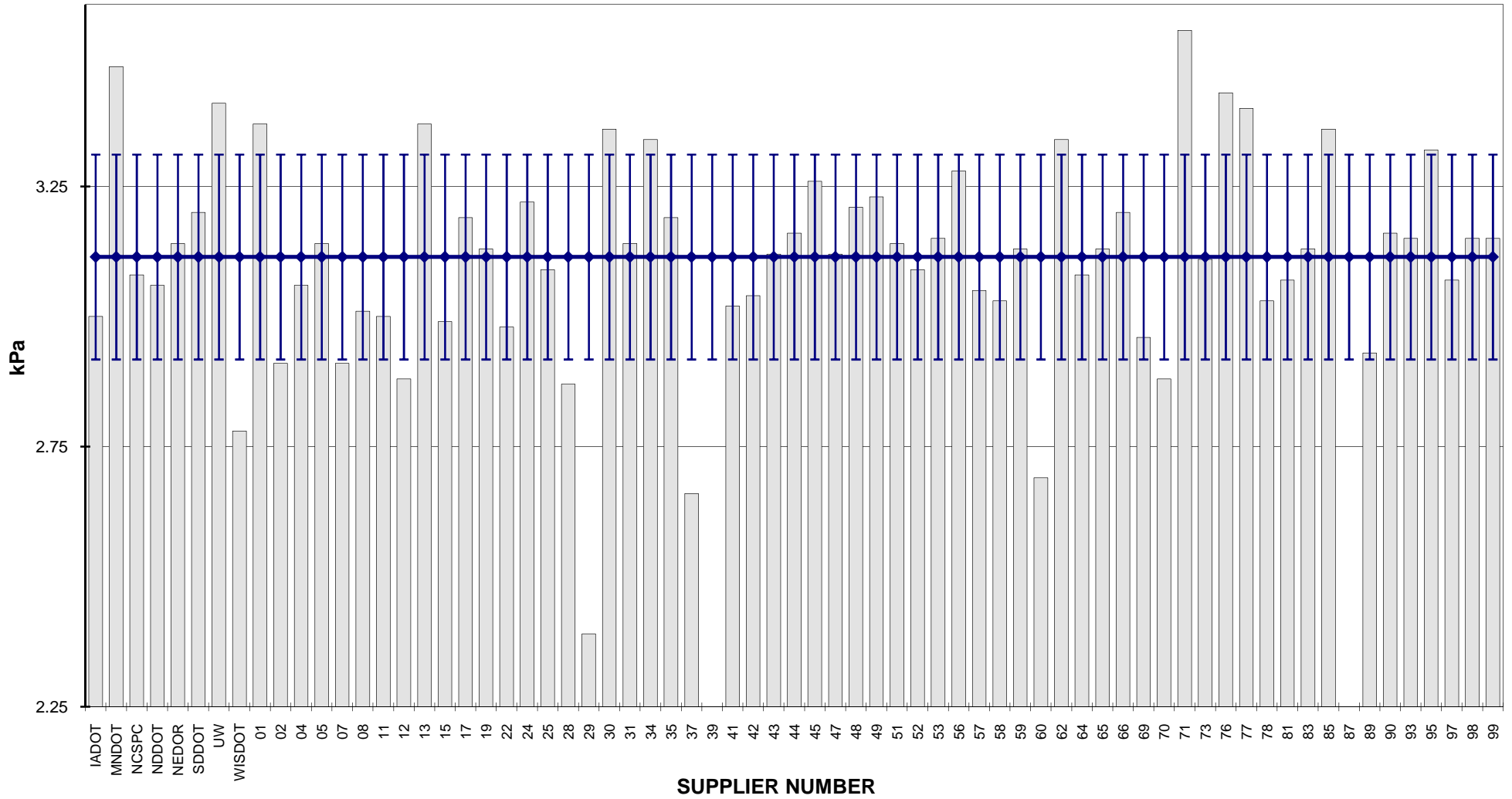
**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1  
SUMMARY A  
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**DSR - ORIGINAL**

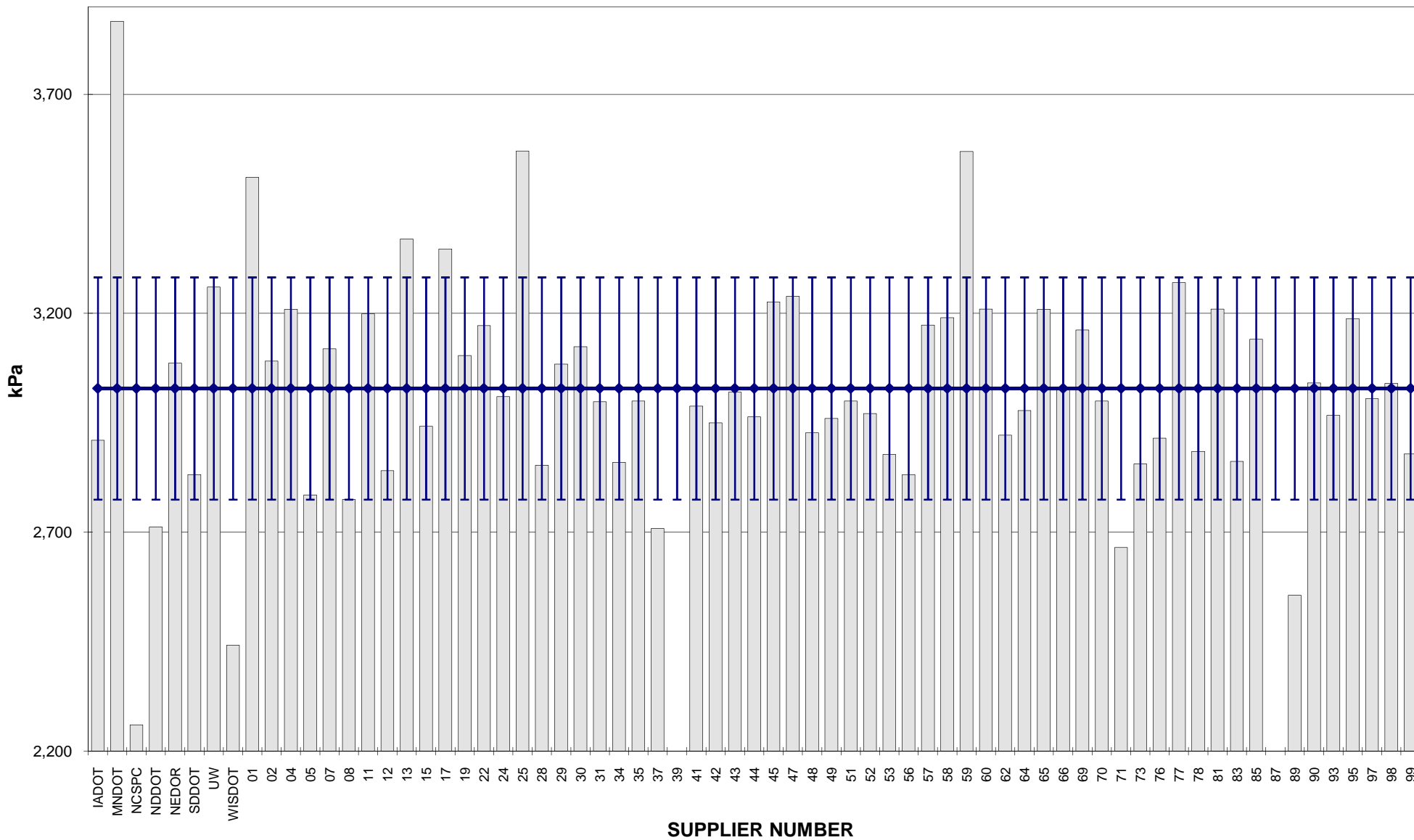


**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1  
SUMMARY A  
PG 64-28**

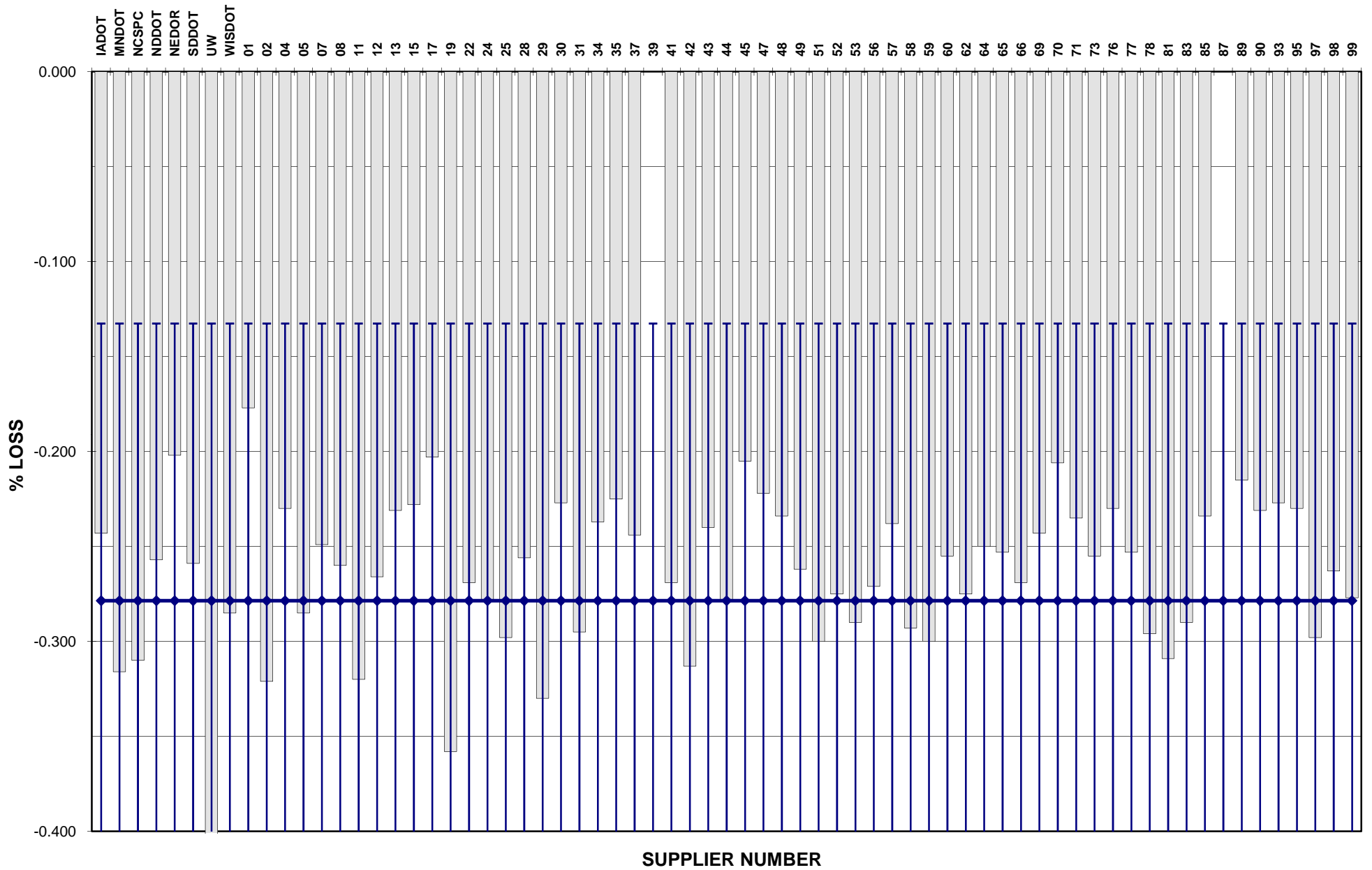
**DSR - RTFO**



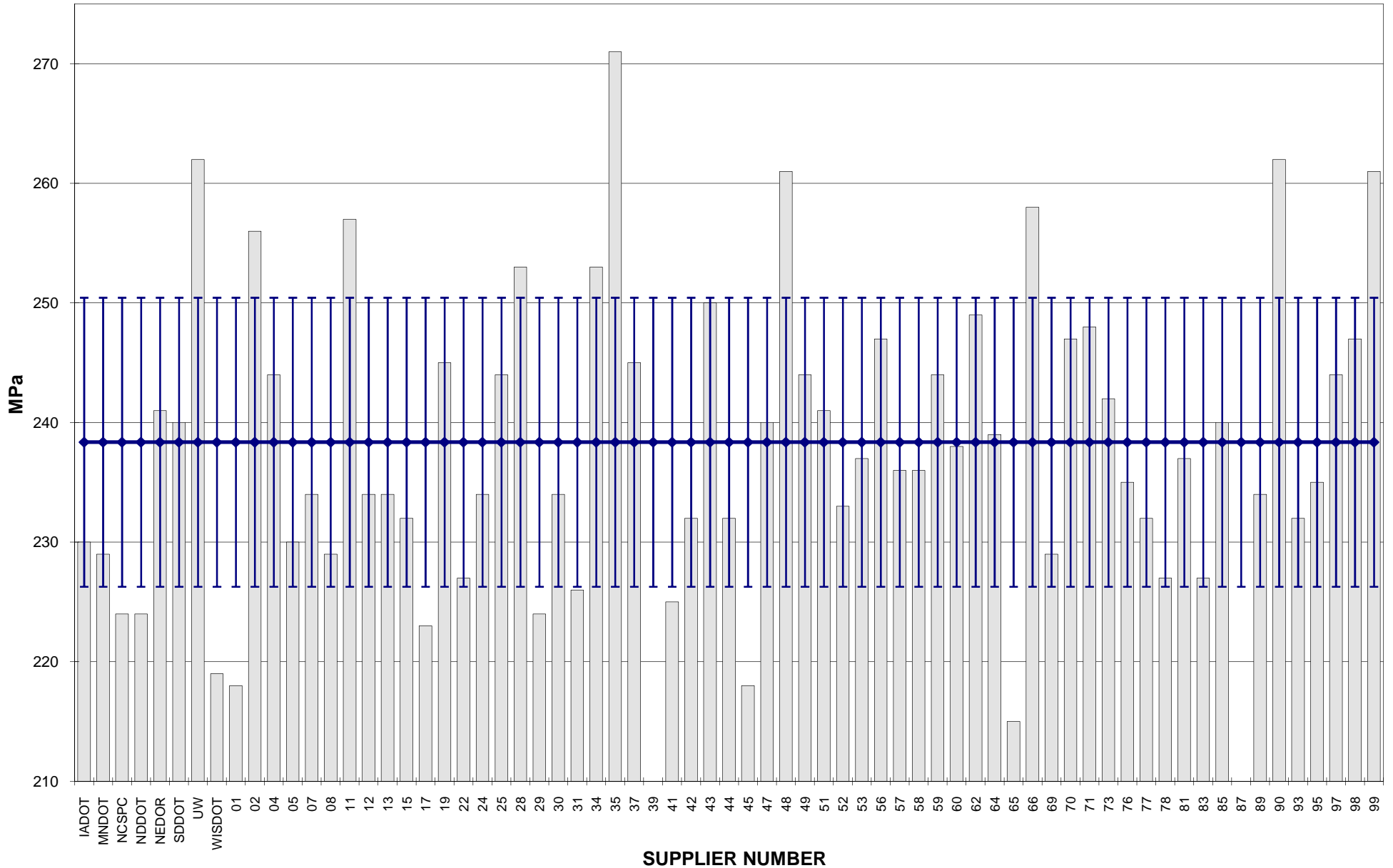
**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1**  
**SUMMARY A**  
**PG 64-28**  
**DSR - PAV**



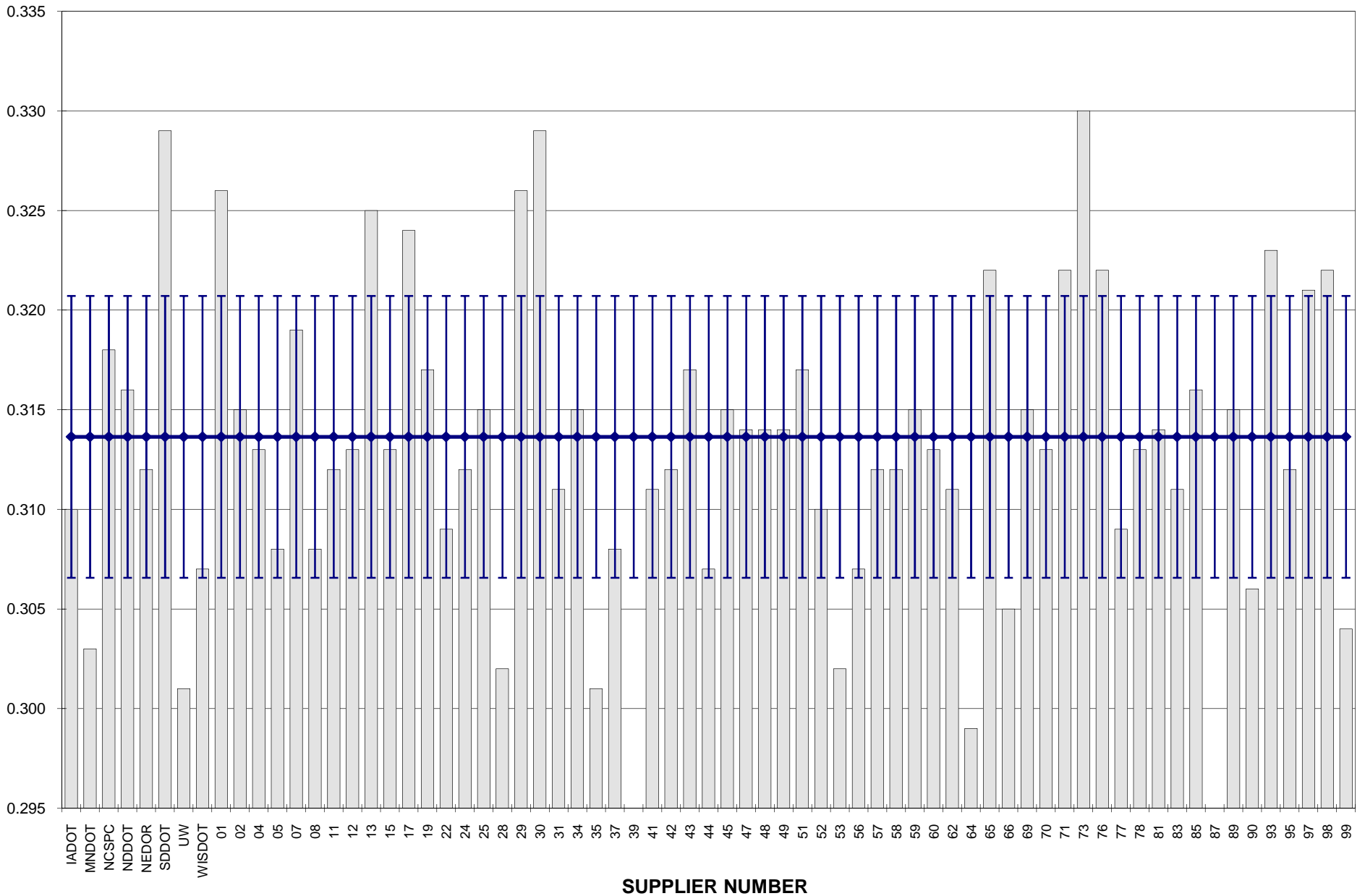
**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1**  
**SUMMARY A**  
**PG 64-28**  
**RTFO MASS LOSS**



**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1**  
**SUMMARY A**  
**PG 64-28**  
**BBR STIFFNESS**



**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1**  
**SUMMARY A**  
**PG 64-28**  
**BBR m-VALUE**





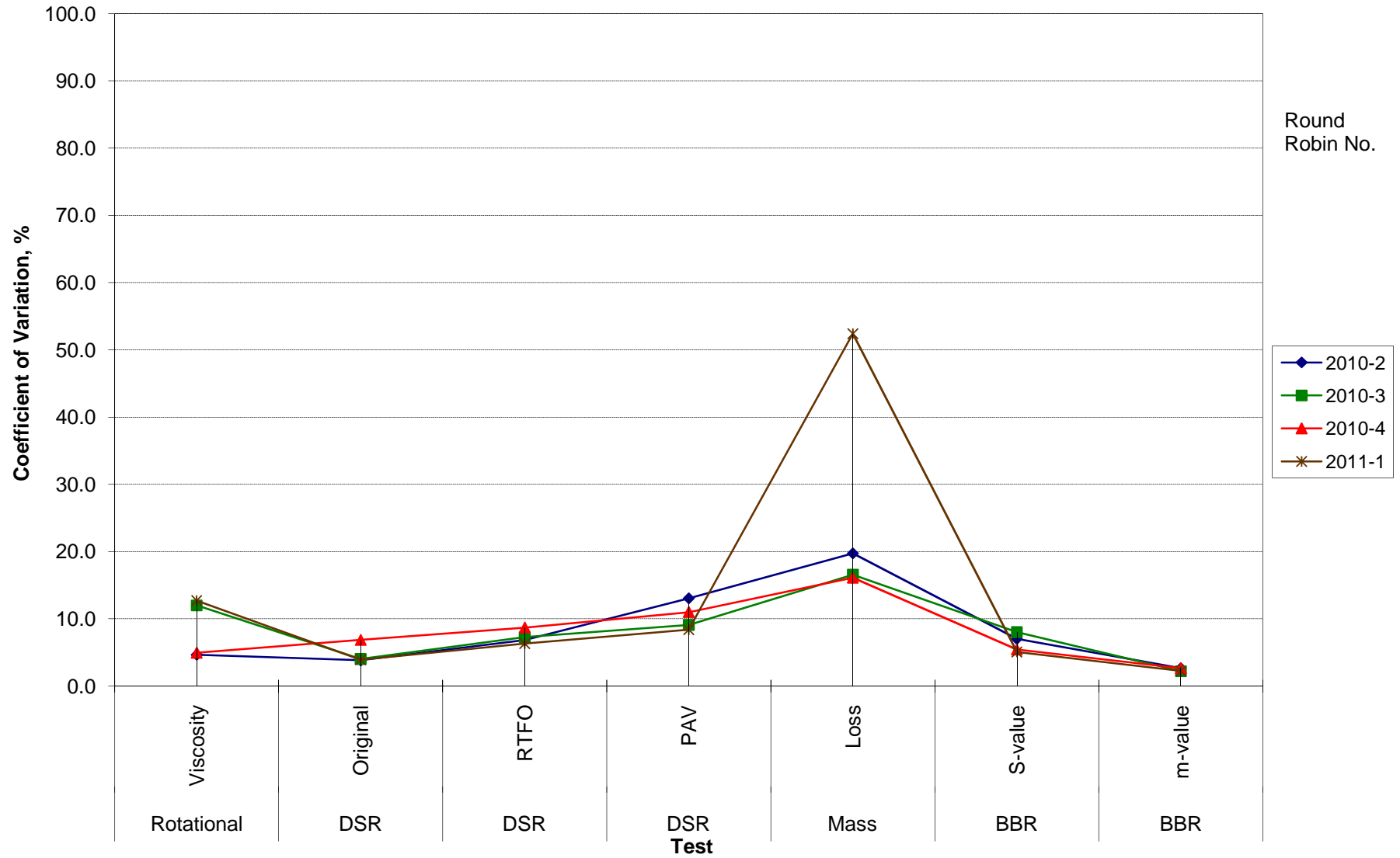
**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1  
SUMMARY A  
64-28**

**COEFFICIENT OF VARIATION**

Round Robin No.	Number of Participants	Coefficient of Variation, %							
		Rotational Viscosity	DSR Original	DSR RTFO	DSR PAV	Mass Loss	BBR S-value	BBR m-value	DTT Strain
2010-2	66	4.651	3.829	6.852	13.055	19.736	7.036	2.666	33.142
2010-3	68	11.997	4.030	7.262	9.080	16.568	8.029	2.199	
2010-4	69	4.954	6.857	8.698	10.983	16.107	5.434	2.649	18.298
2011-1	67	12.705	3.920	6.323	8.380	52.400	5.070	2.254	30.372

**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1**  
**SUMMARY A**  
**64-28**

**COEFFICIENT OF VARIATION**



**COMBINED STATE BINDER GROUP ROUND ROBIN 2011-1  
SUMMARY A  
PG 64-28**

**STATISTICS WITH OUTLIERS REMOVED:**

	<b>Rotational Viscosity (Pa.s) @135°C</b>	<b>DSR Original (kPa) @64°C</b>	<b>DSR RTFO (kPa) @64°C</b>	<b>DSR PAV (kPa) @25°C</b>	<b>Mass Loss (%) @163°C</b>	<b>BBR S-value (MPa) @-12°C</b>	<b>BBR m-value @-12°C</b>
<b>Average</b>	0.555	1.33	3.13	3028	-0.261	238	0.314
<b>Std. Dev.</b>	0.0270	0.0519	0.1766	214.96	0.0358	12.0839	0.0071
<b>Coef. of Var.</b>	4.866	3.920	5.650	7.100	13.715	5.070	2.254