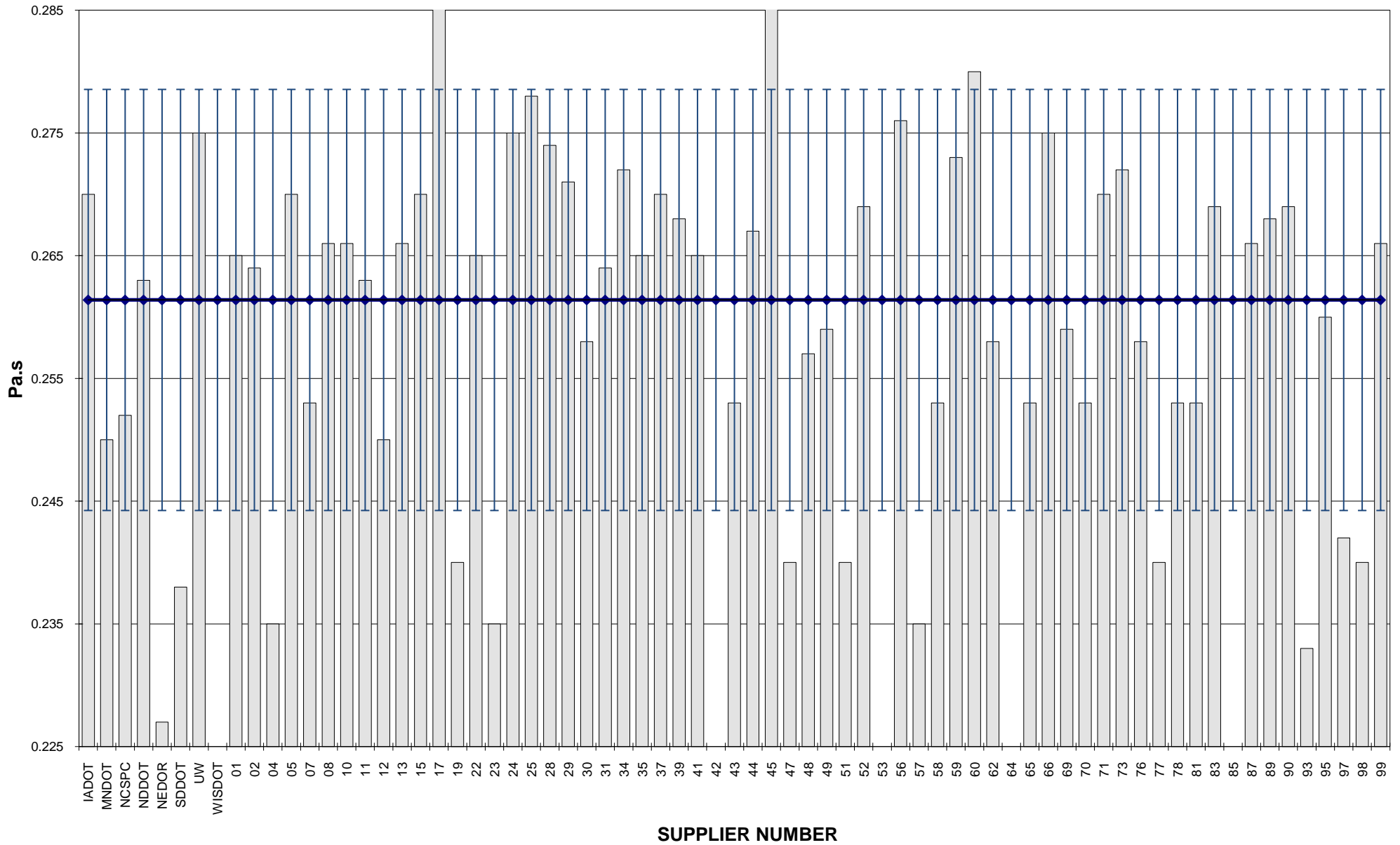


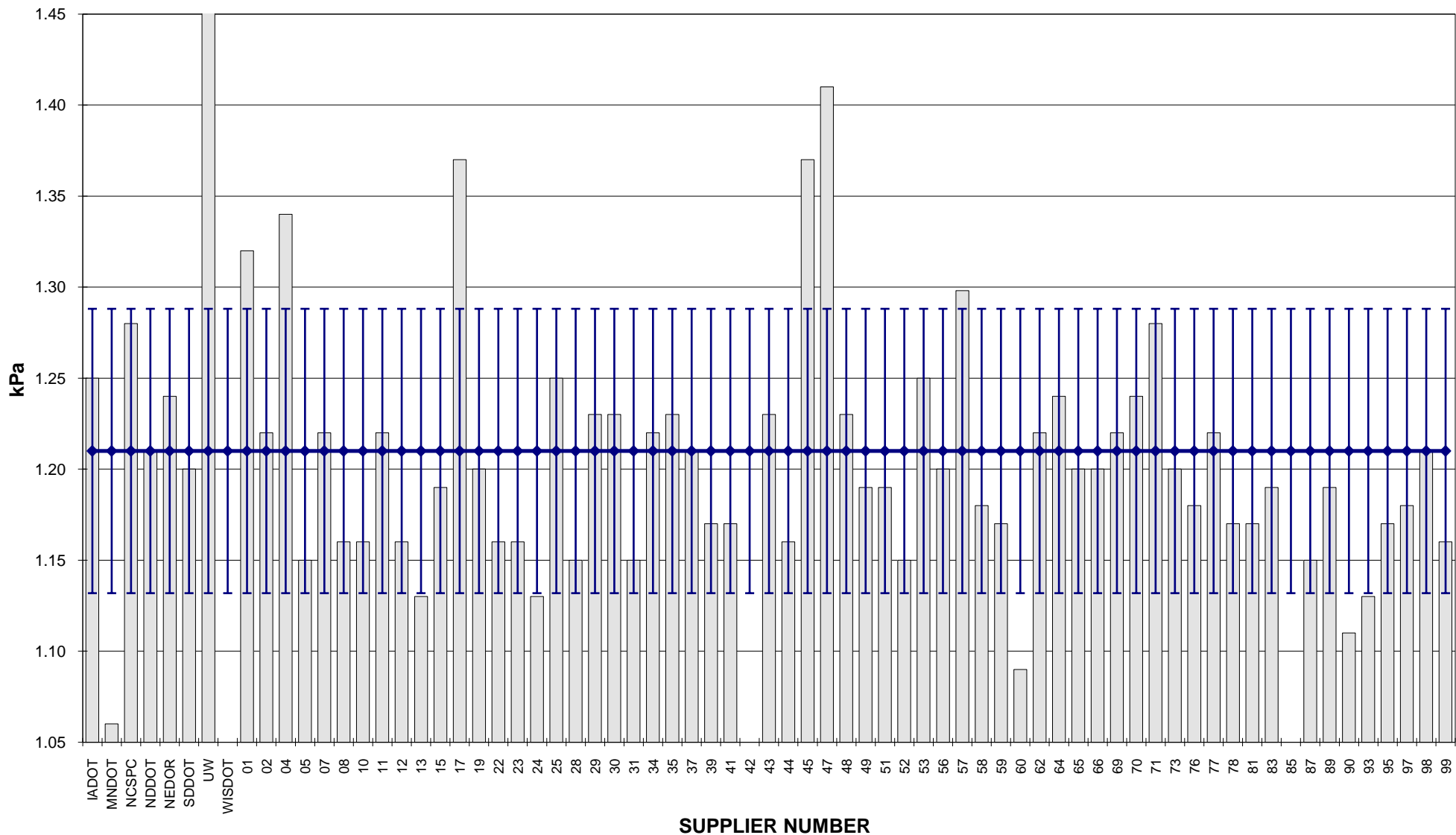
**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1**  
**SUMMARY A**  
**PG 58-28**

Supplier Number	Rotational Viscosity (Pa.s) @135°C	DSR Original (kPa) @58°C	DSR RTFO (kPa) @58°C	DSR PAV (kPa) @19°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	0.270	1.25	3.20	4320	-0.360	227	0.310				4.77	1.09
MNDOT	0.250	1.06	3.03	3839	-0.387	211	0.325				4.29	1.38
NCSPC	0.252	1.28	3.73	4630	-0.446	230	0.316				2.19	1.83
NDDOT	0.263	1.21	2.89	4410	-0.318	215	0.308					
NEDOR	0.227	1.24	3.40	4635	-0.216	231	0.311				4.48	1.37
SDDOT	0.238	1.20	3.19	4346	-0.299	221	0.319					
UW	0.275	1.59	4.00	4823	-0.049	237	0.317					
WISDOT												
01	0.265	1.32	3.77	4745	-0.244	220	0.315				4.01	1.51
02	0.264	1.22	2.95	4386	-0.279	239	0.314				3.45	0.87
04	0.235	1.34	3.27	4794	-0.260	239	0.307					
05	0.270	1.15	3.11	3809	-0.370	225	0.315				4.51	1.19
07	0.253	1.22	2.65	3992	-0.238	237	0.316				3.07	0.81
08	0.266	1.16	3.13	4900	-0.330	229	0.313				4.22	1.09
10	0.266	1.16	3.20	4608	-0.342	226	0.312				4.31	1.18
11	0.263	1.22	2.97	4429	-0.204	253	0.312				3.29	0.95
12	0.250	1.16	3.36	5372	-0.404	230	0.323					
13	0.266	1.13	3.08	4575	-0.242	236	0.320	1.20	3.50	-27.3	4.87	0.32
15	0.270	1.19	3.12	4296	-0.336	225	0.321				4.97	1.20
17	0.325	1.37	3.38	4502	-0.292	230	0.315				3.33	1.37
19	0.240	1.20	3.19	4340	-0.372	246	0.320					
22	0.265	1.16	3.15	4083	-0.345	232	0.312				4.35	1.17
23	0.235	1.16	3.05	4851	-0.246	237	0.314				4.65	1.02
24	0.275	1.13	3.04	4250	-0.306	243	0.313	1.48	4.14	-28.5	3.91	0.52
25	0.278	1.25	3.44	4658	-0.353	231	0.319					
28	0.274	1.15	2.99	4193	-0.297	243	0.304				2.54	0.95
29	0.271	1.23	3.38	3888	-0.388	237	0.322				4.43	1.16
30	0.258	1.23	3.16	4185	-0.332	217	0.316					
31	0.264	1.15	3.11	4129	-0.354	236	0.310				4.26	1.08
34	0.272	1.22	3.02	4061	-0.296	245	0.308				3.45	1.01
35	0.265	1.23	3.26	4860	-0.252	239	0.308					
37	0.270	1.21	2.84	4835	-0.287	238	0.319	1.35	4.34	-29.30	0.80	0.91
39	0.268	1.17	3.17	4683	-0.333	232	0.317				5.03	1.20
41	0.265	1.17	3.13	4512	-0.334	235	0.314				3.95	1.16
42												
43	0.253	1.23	2.89	4630	-0.250	240	0.317				2.47	0.06
44	0.267	1.16	3.13	4598	-0.359	238	0.313				4.25	1.08
45	0.325	1.37	3.57	4426	-0.251	230	0.320				3.83	1.39
47	0.240	1.41	3.27	4861	-0.254	240	0.307					
48	0.257	1.23	3.18	4070	-0.308	239	0.309				3.23	1.05
49	0.259	1.19	3.38	4510	-0.374	230	0.311				2.50	0.58
51	0.240	1.19	3.10	4340	-0.306	250	0.317					
52	0.269	1.15	3.18	4089	-0.335	239	0.309				3.85	1.14
53		1.25	3.57		-0.370	219	0.310					
56	0.276	1.20	3.09	4569	-0.230	252	0.307				2.49	0.95
57	0.235	1.30	3.27	4859	-0.258	240	0.307					
58	0.253	1.18	3.39	4440	-0.375	235	0.315				2.86	0.56
59	0.273	1.17	2.99	2189	-0.364	218	0.319					
60	0.280	1.09	2.78	4610	-0.378	225	0.316					
62	0.258	1.22	3.29	4523	-0.246	261	0.307				5.05	1.12
64		1.24	3.23		-0.340	214	0.322					
65	0.253	1.20	3.04	4254	-0.301	224	0.326				4.37	1.14
66	0.275	1.20	3.05	4385	-0.269	248	0.302				3.78	1.01
69	0.259	1.22	2.77	4164	-0.298	230	0.318				4.23	0.89
70	0.253	1.24	3.16	4094	-0.277	224	0.326					
71	0.270	1.28	3.20	4371	-0.286	226	0.323					
73	0.272	1.20	3.17	4315	-0.339	226	0.322					
76	0.258	1.18	3.06	2840	-0.318	223	0.331				3.09	0.27
77	0.240	1.22	3.25	4790	-0.274	235	0.314				2.52	0.52
78	0.253	1.17	3.38	4810	-0.375	236	0.316				3.56	0.57
81	0.253	1.17	3.51	4810	-0.374	238	0.316				2.77	0.67
83	0.269	1.19	3.09	4324	-0.246	230	0.323				2.92	0.94
85												
87	0.266	1.15	3.11	4023	-0.361	222	0.310				4.23	1.12
89	0.268	1.19	3.08	3594	-0.330	223	0.319				3.41	1.09
90	0.269	1.11	3.26	4830	-0.276	253	0.300				4.69	1.22
93	0.233	1.13	3.03	4687	-0.242	241	0.314				3.70	0.97
95	0.260	1.17	3.10	4323	-0.259	222	0.319					
97	0.242	1.18	3.25	4390	-0.328	246	0.317					
98	0.240	1.21	3.22	3860	-0.350	247	0.324					
99	0.266	1.16	3.03	4561	-0.260	248	0.306				2.55	1.09
<b>Average</b>	0.261	1.21	3.18	4380	-0.307	234	0.315	1.34	3.99	-28.37	3.68	1.00
<b>Std. Dev.</b>	0.0172	0.0781	0.2276	469.04	0.0614	10.4628	0.0062	0.1401	0.4388	1.0066	0.9133	0.3334
<b>Coef. of Var.</b>	6.563	6.456	7.152	10.709	20.015	4.479	1.967	10.431	10.988	-3.549	24.787	33.508

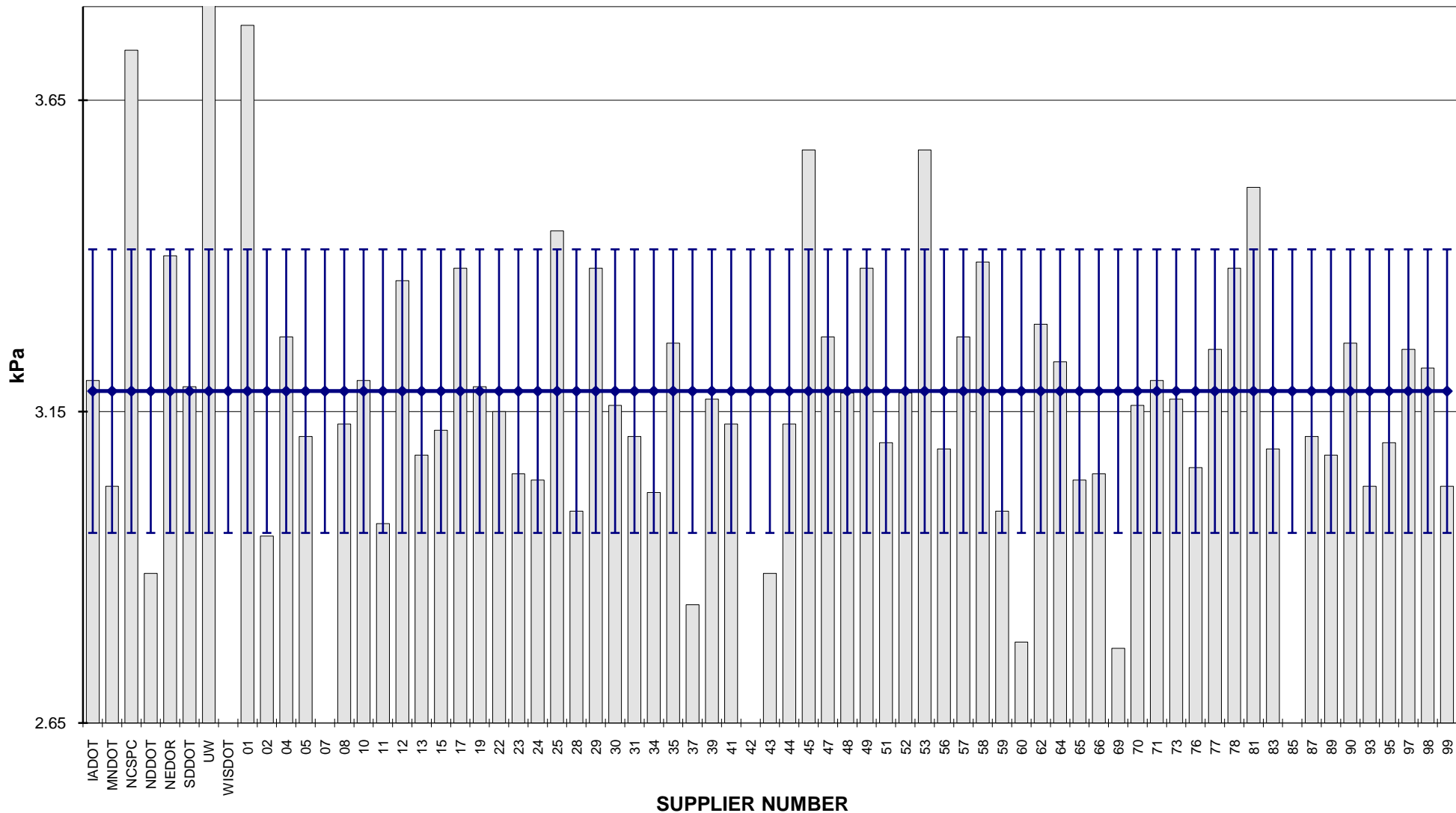
**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1  
SUMMARY A  
PG 58-28  
ROTATIONAL VISCOSITY**



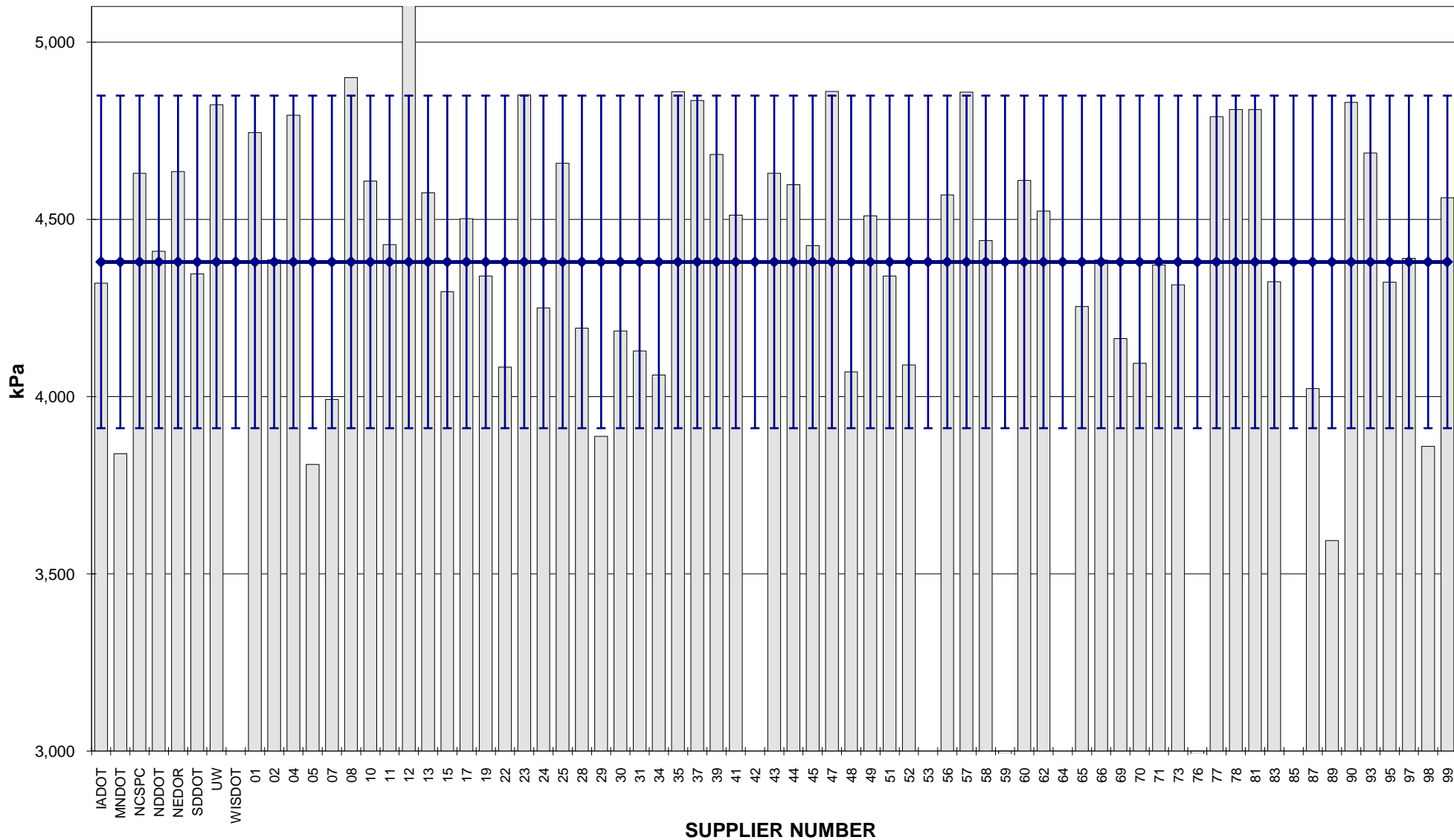
**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1  
SUMMARY A  
PG 58-28  
DSR - ORIGINAL**



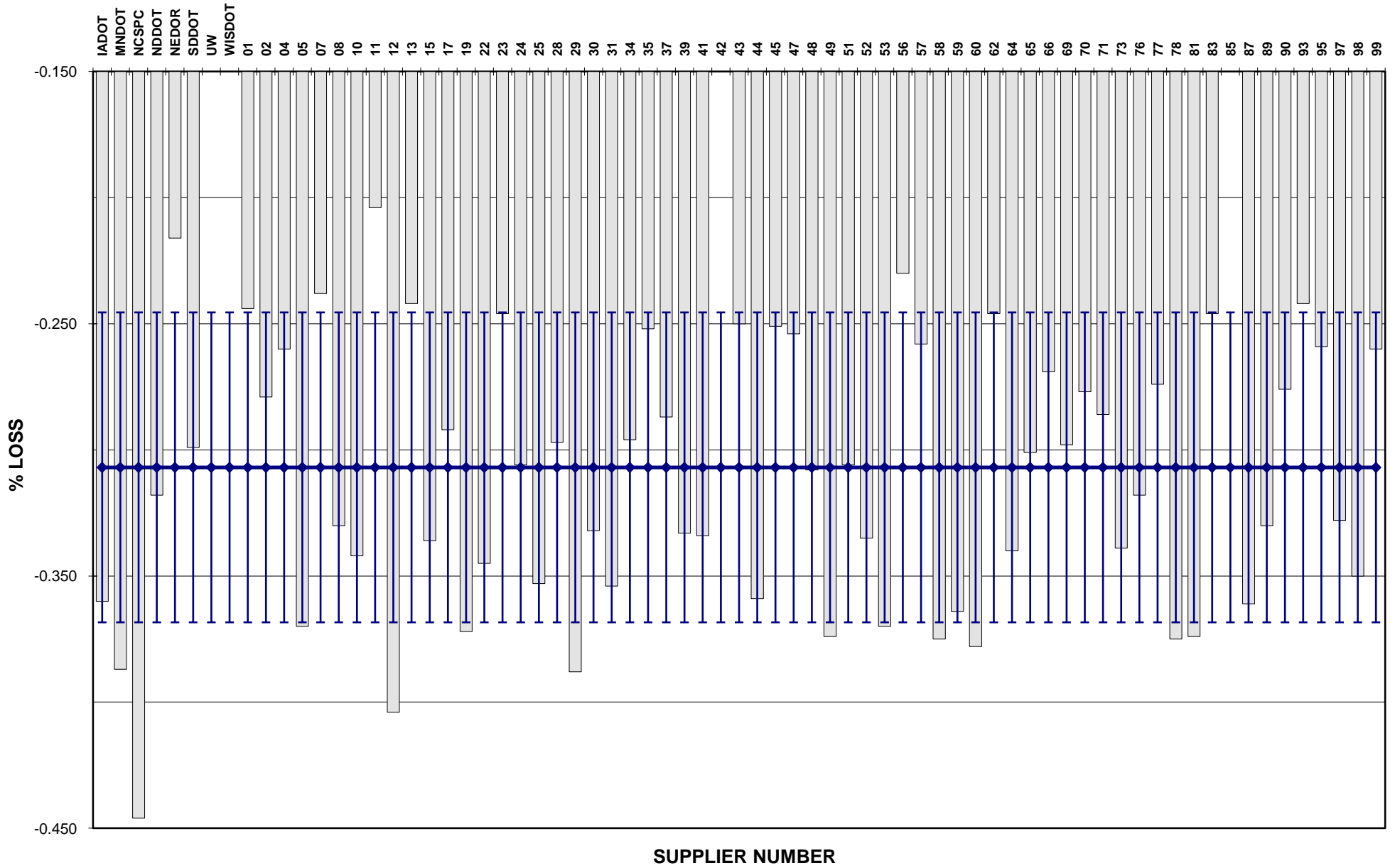
**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1**  
**SUMMARY A**  
**PG 58-28**  
**DSR - RTFO**



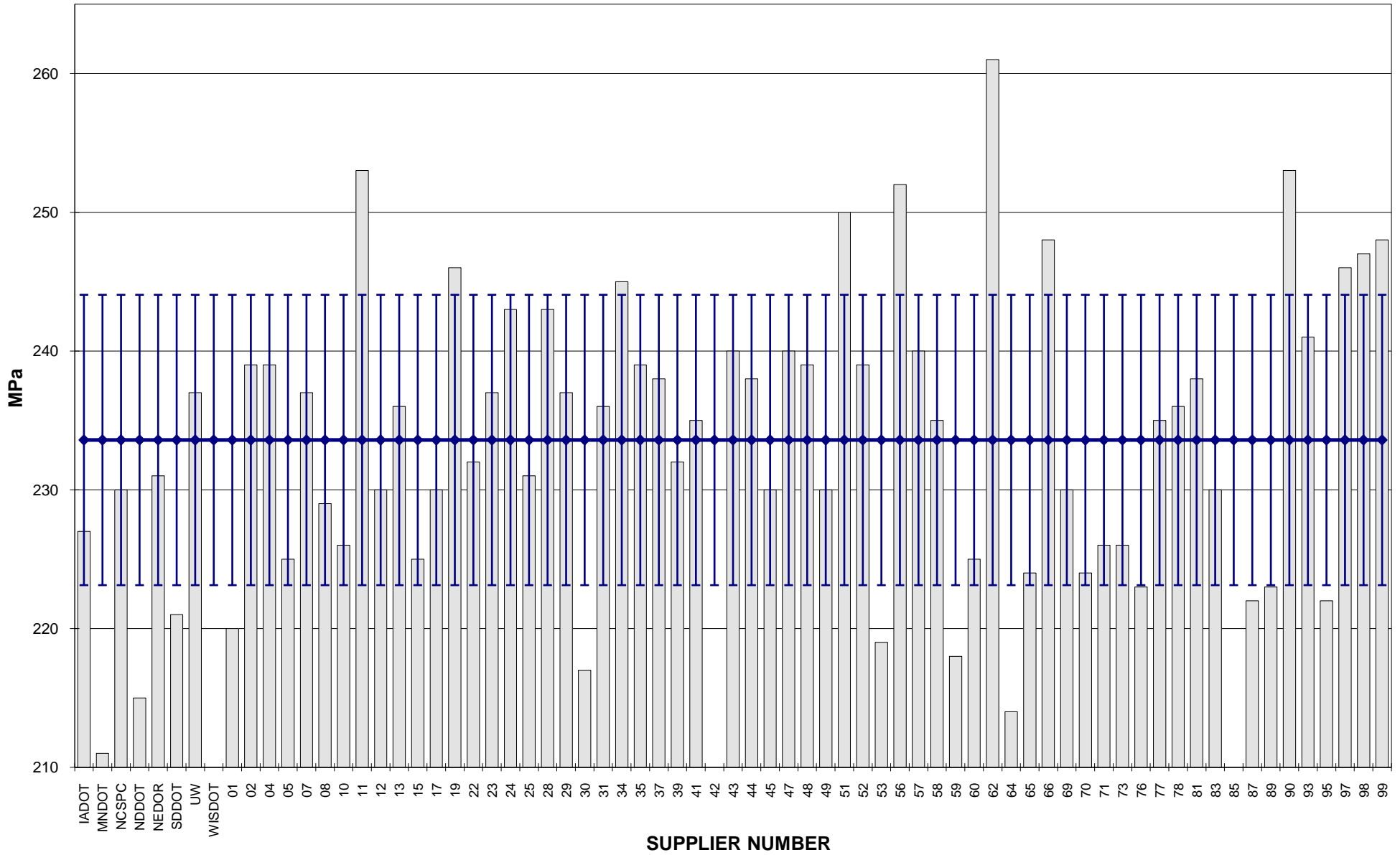
**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1**  
**SUMMARY A**  
**PG 58-28**  
**DSR - PAV**



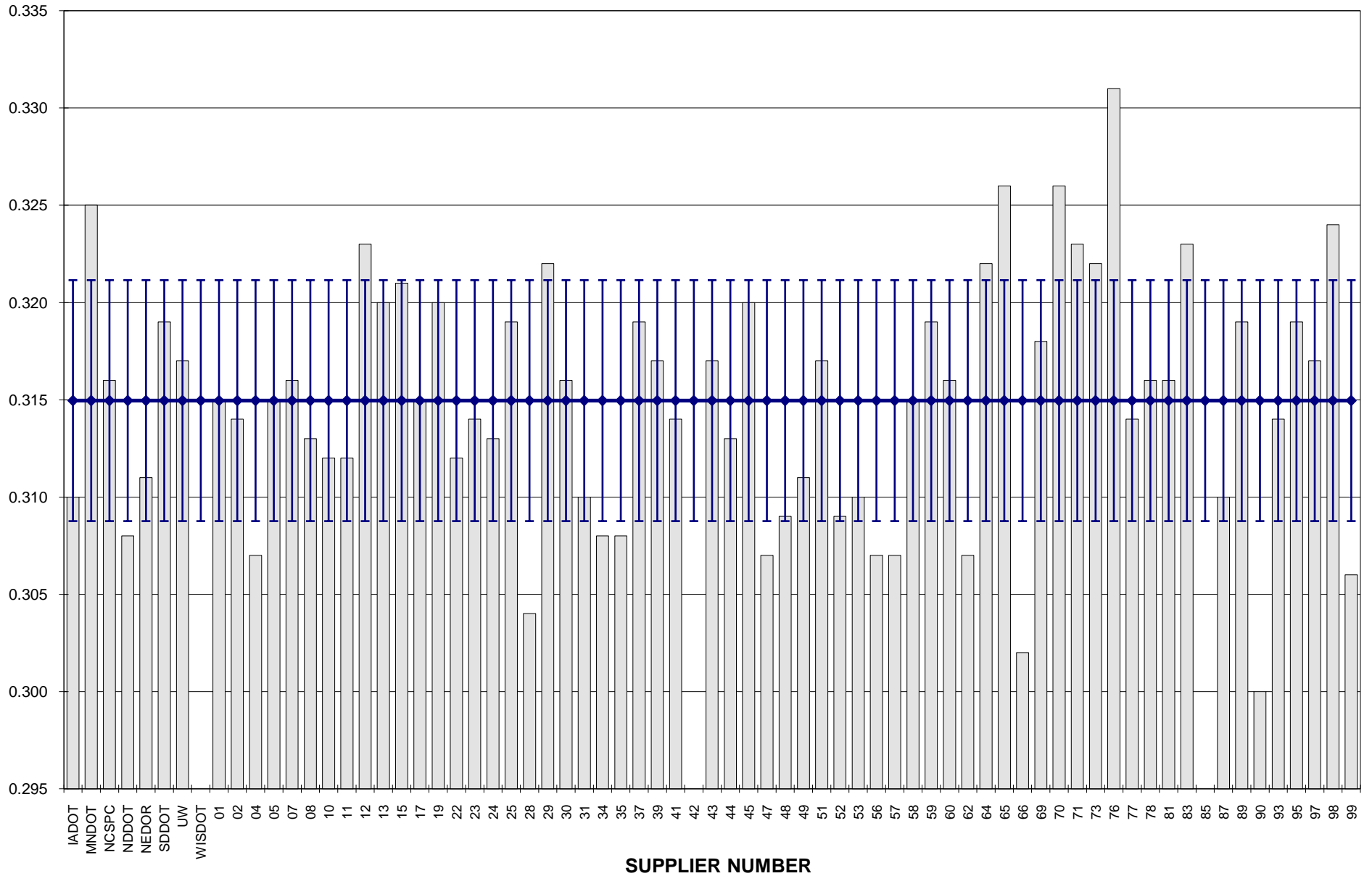
**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1  
SUMMARY A  
PG 58-28  
RTFO MASS LOSS**



**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1**  
**SUMMARY A**  
**PG 58-28**  
**BBR STIFFNESS**



**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1**  
**SUMMARY A**  
**PG 58-28**  
**BBR m-VALUE**





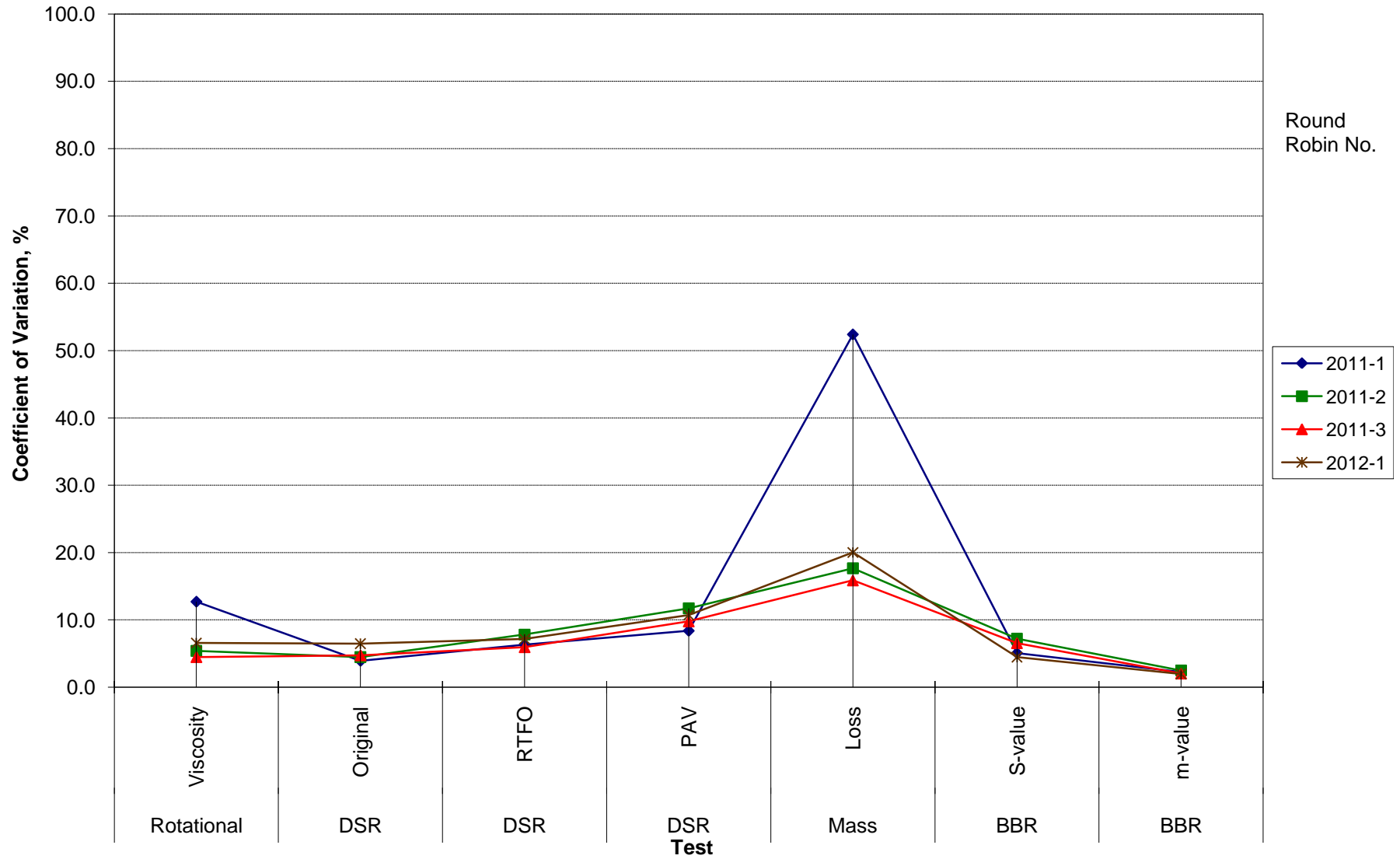
**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1  
SUMMARY A  
58-28**

**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
2011-1	67	12.705	3.920	6.323	8.380	52.400	5.070	2.254	30.372
2011-2	66	5.387	4.474	7.818	11.706	17.671	7.201	2.492	5.946
2011-3	67	4.478	4.737	5.952	9.779	15.876	6.551	2.034	8.775
2012-1	68	6.563	6.456	7.152	10.709	20.015	4.479	1.967	10.431

**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1**  
**SUMMARY A**  
**58-28**

**COEFFICIENT OF VARIATION**



**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-1  
SUMMARY A  
PG 58-28**

**STATISTICS WITH OUTLIERS REMOVED:**

	<b>Rotational Viscosity (Pa.s) @135°C</b>	<b>DSR Original (kPa) @58°C</b>	<b>DSR RTFO (kPa) @58°C</b>	<b>DSR PAV (kPa) @19°C</b>	<b>Mass Loss (%) @163°C</b>	<b>BBR S-value (MPa) @-18°C</b>	<b>BBR m-value @-18°C</b>
<b>Average</b>	0.259	1.20	3.17	4438	-0.311	234	0.315
<b>Std. Dev.</b>	0.0131	0.0630	0.2057	331.19	0.0530	10.4628	0.0062
<b>Coef. of Var.</b>	5.044	5.234	6.489	7.462	17.051	4.479	1.967