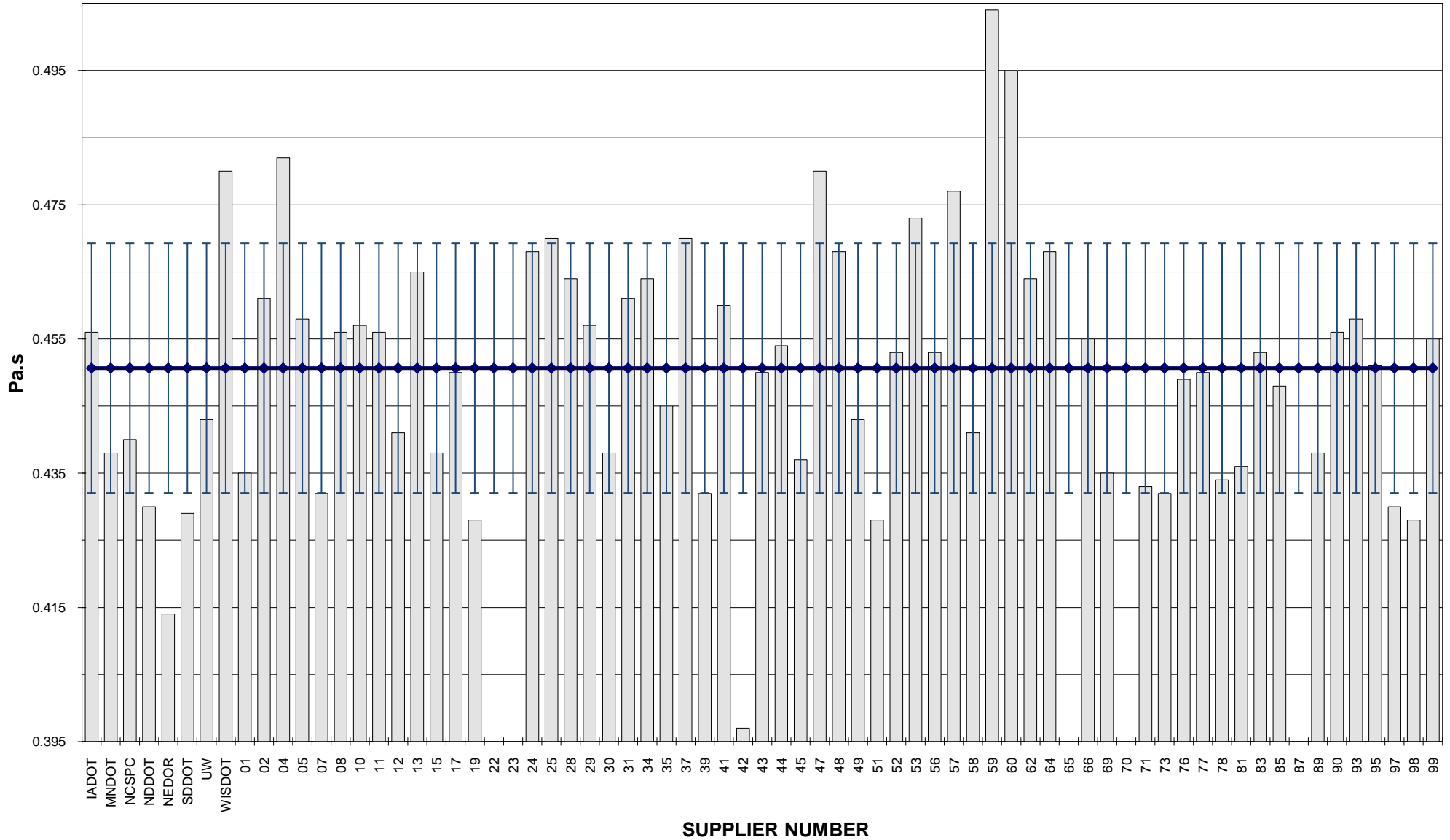


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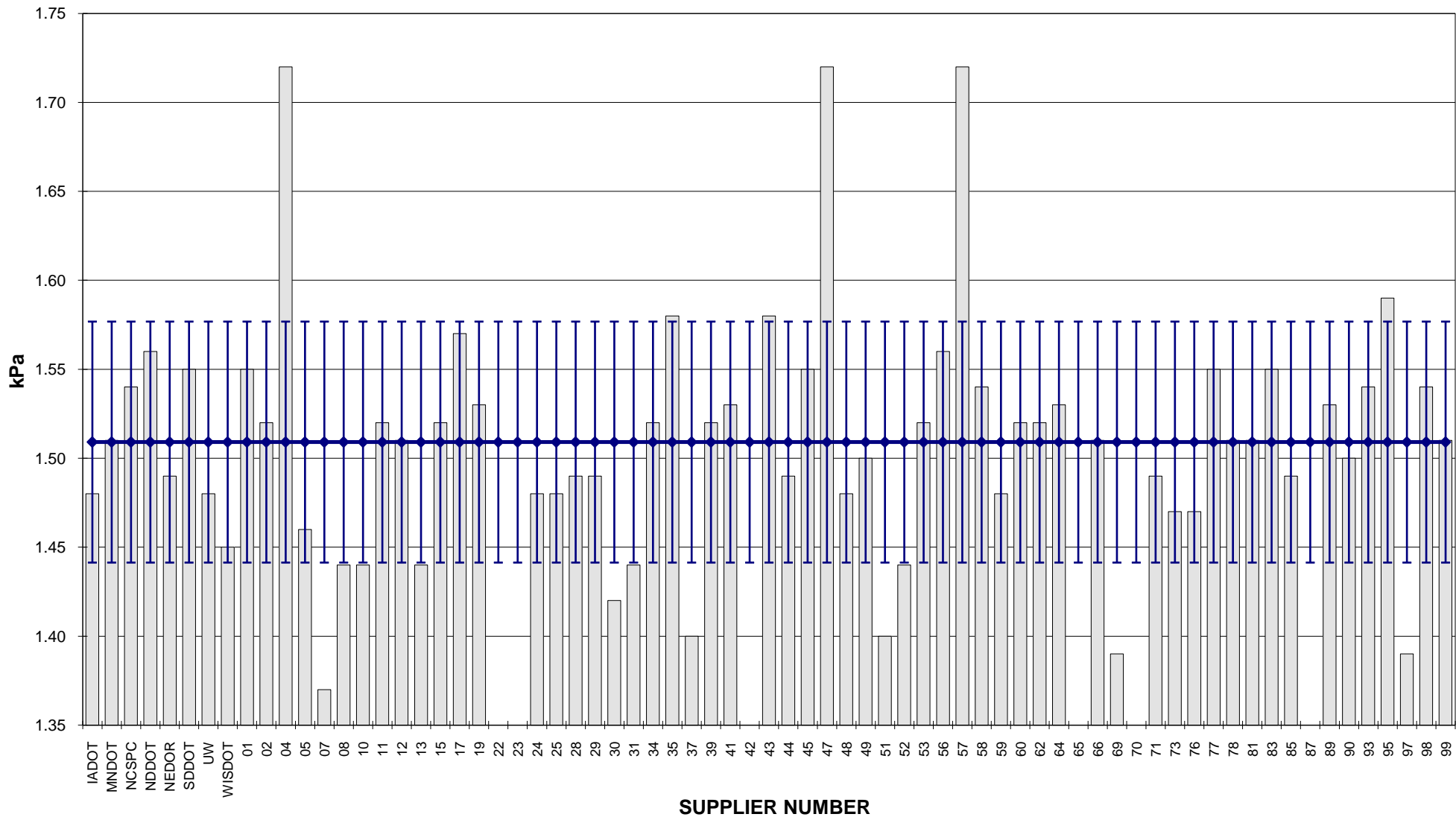
Supplier Number	Rotational Viscosity (Pa.s) @135°C	DSR Original (kPa) @64°C	DSR RTFO (kPa) @ 64°C	DSR PAV (kPa) @25°C	Mass Loss (%) @163°C	BBR S-value (MPa) @-12°C	BBR m-value @-12°C	DTT Strain (%) @-12°C	DTT Stress (MPa) @-12°C	CRITICAL CRACK TEMP (°C)	MSCR % RECOVERY @ 100Pa @58° C	MSCR % RECOVERY @ 3200Pa @ 58° C
IADOT	0.456	1.48	3.51	4550	-0.264	237	0.322				6.91	3.82
MNDOT	0.438	1.51	3.94	4787	-0.198	214	0.317				7.85	5.06
NCSPC	0.440	1.54	4.17	3710	-0.302	219	0.332				7.83	4.54
NDDOT	0.430	1.56	3.83	4896	-0.249	248	0.315				8.88	4.32
NEDOR	0.414	1.49	4.48	4902	-0.192	251	0.316				1.15	5.47
SDDOT	0.429	1.55	3.95	4423	-0.179	201	0.316					
UW	0.443	1.48	4.40	4610	-0.228	251	0.322					
WISDOT	0.480	1.45	3.32	4961	-0.200	221	0.316					
01	0.435	1.55	4.23	4813	-0.173	221	0.332				3.98	1.49
02	0.461	1.52	3.53	3672	-0.205	211	0.338				5.19	3.41
04	0.482	1.72	4.21	3923	-0.225	257	0.314					
05	0.458	1.46	3.78	4867	-0.269	240	0.330				7.19	4.01
07	0.432	1.37	3.11	4732	-0.267	234	0.322				5.32	2.92
08	0.456	1.44	3.73	4859	-0.257	235	0.329				7.16	3.93
10	0.457	1.44	3.73	5344	-0.279	250	0.324				6.72	3.89
11	0.456	1.52	3.85	3756	-0.215	219	0.344				9.48	4.27
12	0.441	1.51	3.77	4556	-0.316	233	0.328					
13	0.465	1.44	3.87	4490	-0.256	216	0.353	1.29	4.17	-23.4	8.56	4.50
15	0.438	1.52	3.83	4320	-0.261	225	0.329				9.58	4.68
17	0.450	1.57	4.36	4913	-0.166	220	0.313				3.59	1.59
19	0.428	1.53	3.78	4480	-0.277	235	0.330					
22												
23												
24	0.468	1.48	4.07	4715	-0.233	231	0.324	1.3	4.3	-23.5	6.70	2.10
25	0.470	1.48	3.98	4971	-0.225	239	0.323					
28	0.464	1.49	3.86	4571	-0.224	244	0.322				9.26	4.35
29	0.457	1.49	4.25	4455	-0.254	199	0.339				9.40	4.90
30	0.438	1.42	3.64	4477	-0.252	221	0.327					
31	0.461	1.44	3.76	4783	-0.267	233	0.330				6.97	3.91
34	0.464	1.52	3.68	3675	-0.177	222	0.347				5.72	3.74
35	0.445	1.58	4.57	4990	-0.251	255	0.308					
37	0.470	1.40	3.24	4811	-0.257	237	0.325	1.27	3.92	-22.7	6.07	3.16
39	0.432	1.52	3.78	4740	-0.238	241	0.322				6.61	3.59
41	0.460	1.53	3.82	4784	-0.244	229	0.331				6.74	3.94
42	0.397		3.82	4420	-0.297	227	0.324				6.73	3.80
43	0.450	1.58		4760	-0.228	242	0.326					
44	0.454	1.49	3.63	5005	-0.262	250	0.332				6.74	3.80
45	0.437	1.55	4.35	5080	-0.187	232	0.322				4.18	1.60
47	0.480	1.72	4.21	3891	-0.223	258	0.314					
48	0.468	1.48	3.69	3989	-0.180	218	0.341				7.66	3.81
49	0.443	1.50	3.66	4700	-0.229	223	0.329				6.16	3.56
51	0.428	1.40	3.78	4380	-0.220	244	0.328					
52	0.453	1.44	3.72	4783	-0.282	241	0.329				6.69	3.78
53	0.473	1.52	4.12	4800	-0.366	265	0.313					
56	0.453	1.56	3.79	4129	-0.244	189	0.350				6.14	3.95
57	0.477	1.72	4.22	3979	-0.222	256	0.313					
58	0.441	1.54	3.92	4775	-0.268	233	0.330				7.69	4.61
59	0.504	1.48	3.71	4735	-0.257	253	0.322					
60	0.495	1.52	3.27	5090	-0.255	226	0.325					
62	0.464	1.52	3.33	4427	-0.174	240	0.330				5.49	3.06
64	0.468	1.53	4.61	4920	-0.298	274	0.306					
65												
66	0.455	1.51	4.22	4975	-0.234	250	0.315				10.54	4.88
69	0.435	1.39	3.16	4360	-0.263	226	0.330	1.58	4.63	-24.9	5.54	3.08
70												
71	0.433	1.49	3.83	4257	-0.270	228	0.324					
73	0.432	1.47	4.05	4692	-0.257	241	0.323					
76	0.449	1.47	3.68	4560	-0.292	183	0.359				6.62	3.62
77	0.450	1.55	6.02	4720	-0.229	225	0.323				4.65	1.35
78	0.434	1.51	3.99	4740	-0.234	235	0.331				7.04	4.12
81	0.436	1.51	3.90	4770	-0.241	233	0.327				7.44	4.34
83	0.453	1.55	3.70	4547	-0.221	246	0.330					
85	0.448	1.49	3.76	3170	-0.335	224	0.333				6.89	3.71
87												
89	0.438	1.53	3.83	4410	-0.268	222	0.327				4.44	4.68
90	0.456	1.50	4.05	5139	-0.229	256	0.315				6.57	4.62
93	0.458	1.54	3.98	4606	-0.242	238	0.328				3.65	4.37
95	0.451	1.59	4.01	4860	-0.217	243	0.325					
97	0.430	1.39	4.06	4240	-0.301	233	0.330					
98	0.428	1.54	3.90	4010	-0.212	239	0.331					
99	0.455	1.51	4.21	4946	-0.212	247	0.308				5.34	4.95
Average	0.451	1.51	3.91	4567	-0.243	234	0.326	1.36	4.26	-23.63	6.58	3.80
Std. Dev.	0.0186	0.0677	0.4154	417.55	0.0395	16.86	0.0103	0.1472	0.2956	0.9215	1.8367	0.9775
Coef. of Var.	4.127	4.488	10.623	9.143	16.247	7.210	3.146	10.823	6.947	-3.901	27.901	25.741

# ROTATIONAL VISCOSITY



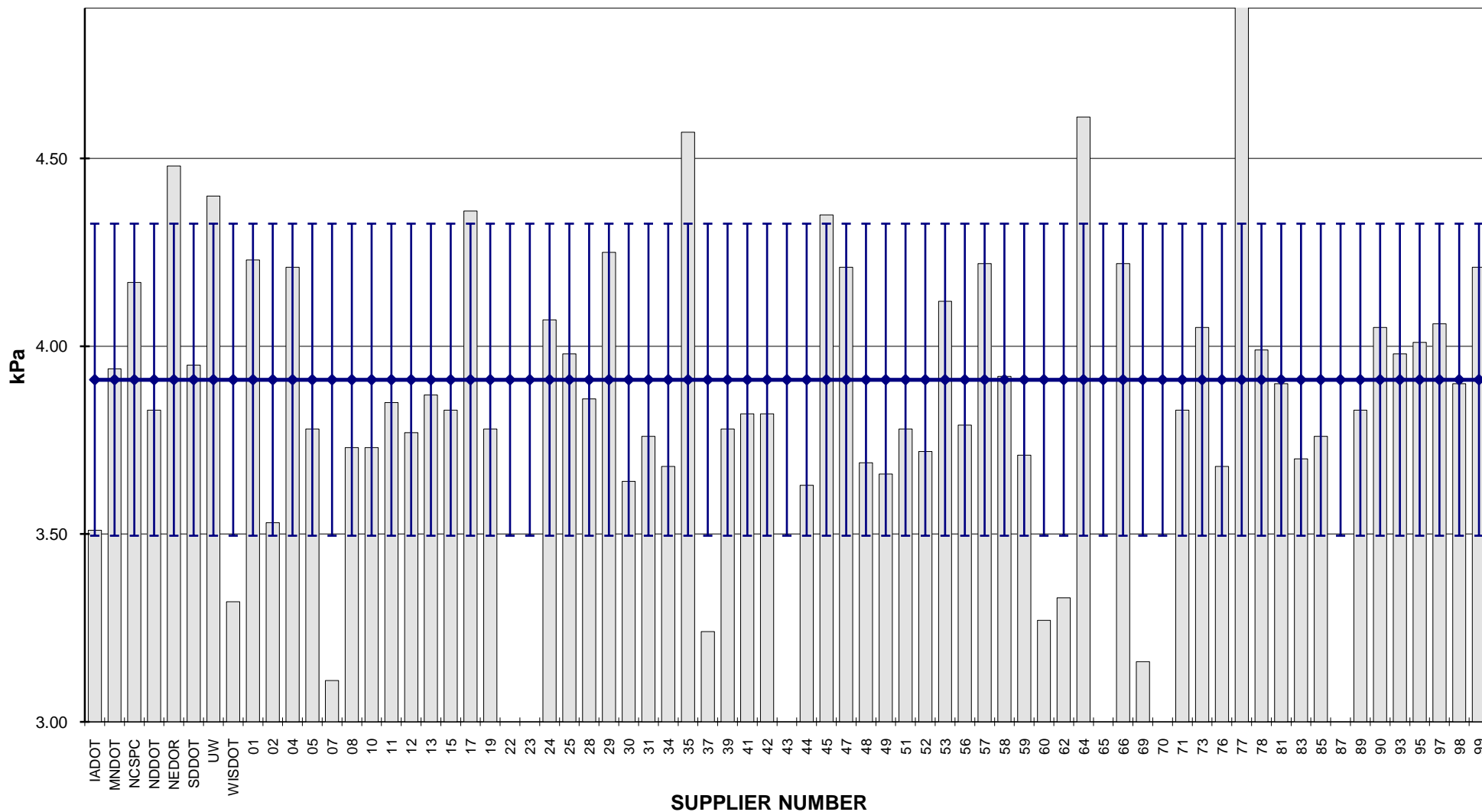
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**DSR - ORIGINAL**



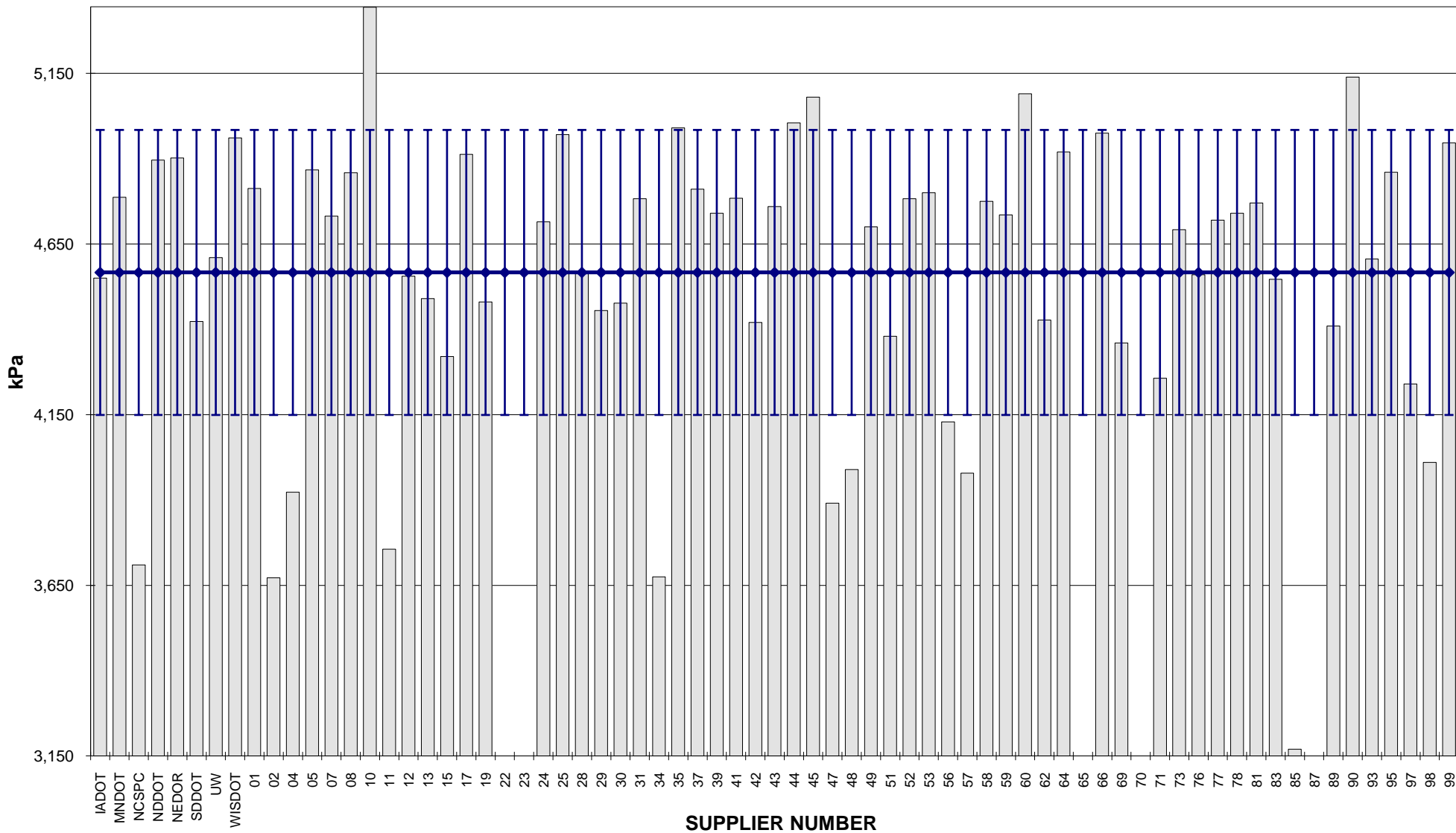
**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-4  
SUMMARY A  
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**DSR - RTFO**



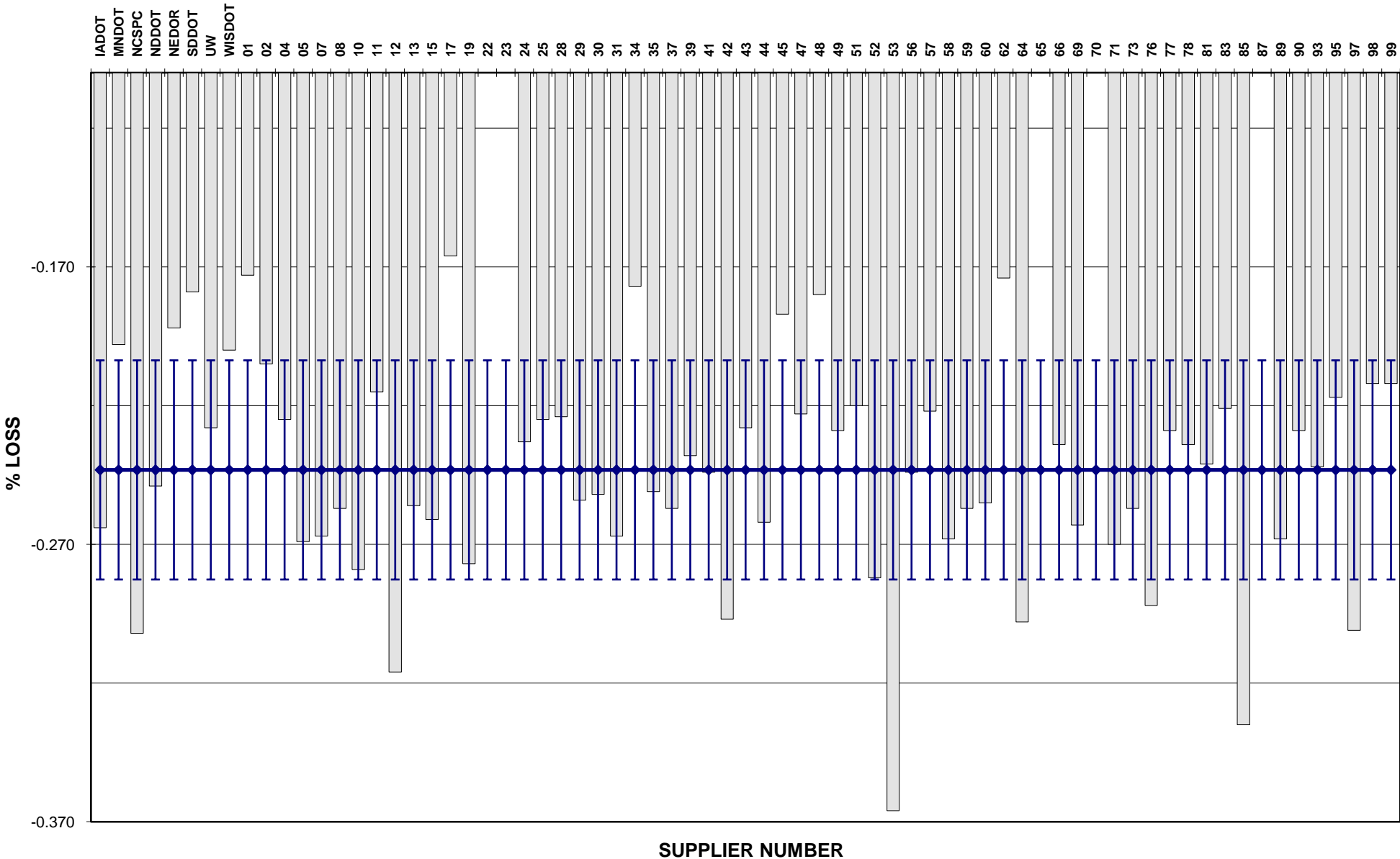
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**DSR - PAV**



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RTFO MASS LOSS

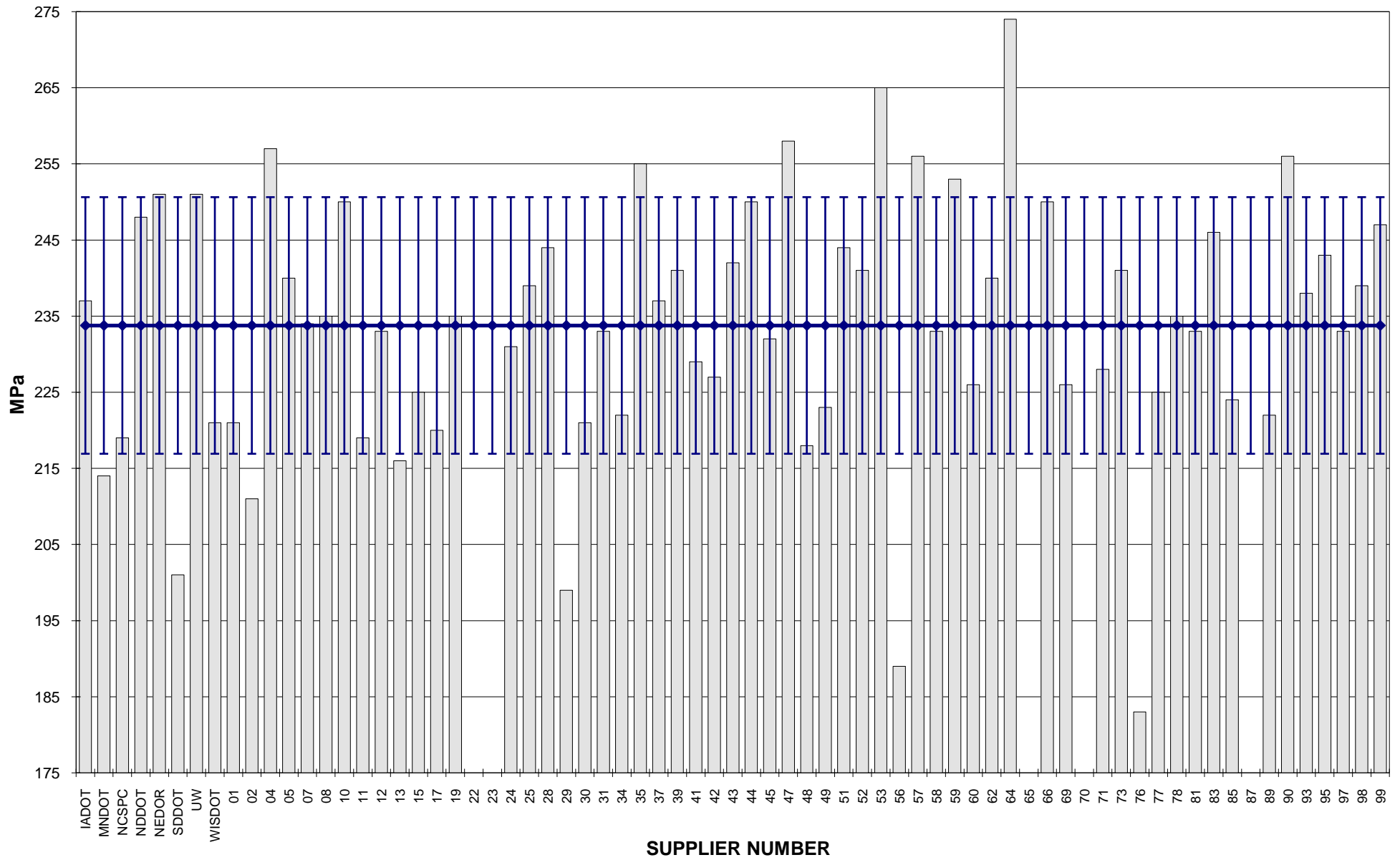


COMBINED STATE BINDER GROUP ROUND ROBIN 2012-4

SUMMARY A

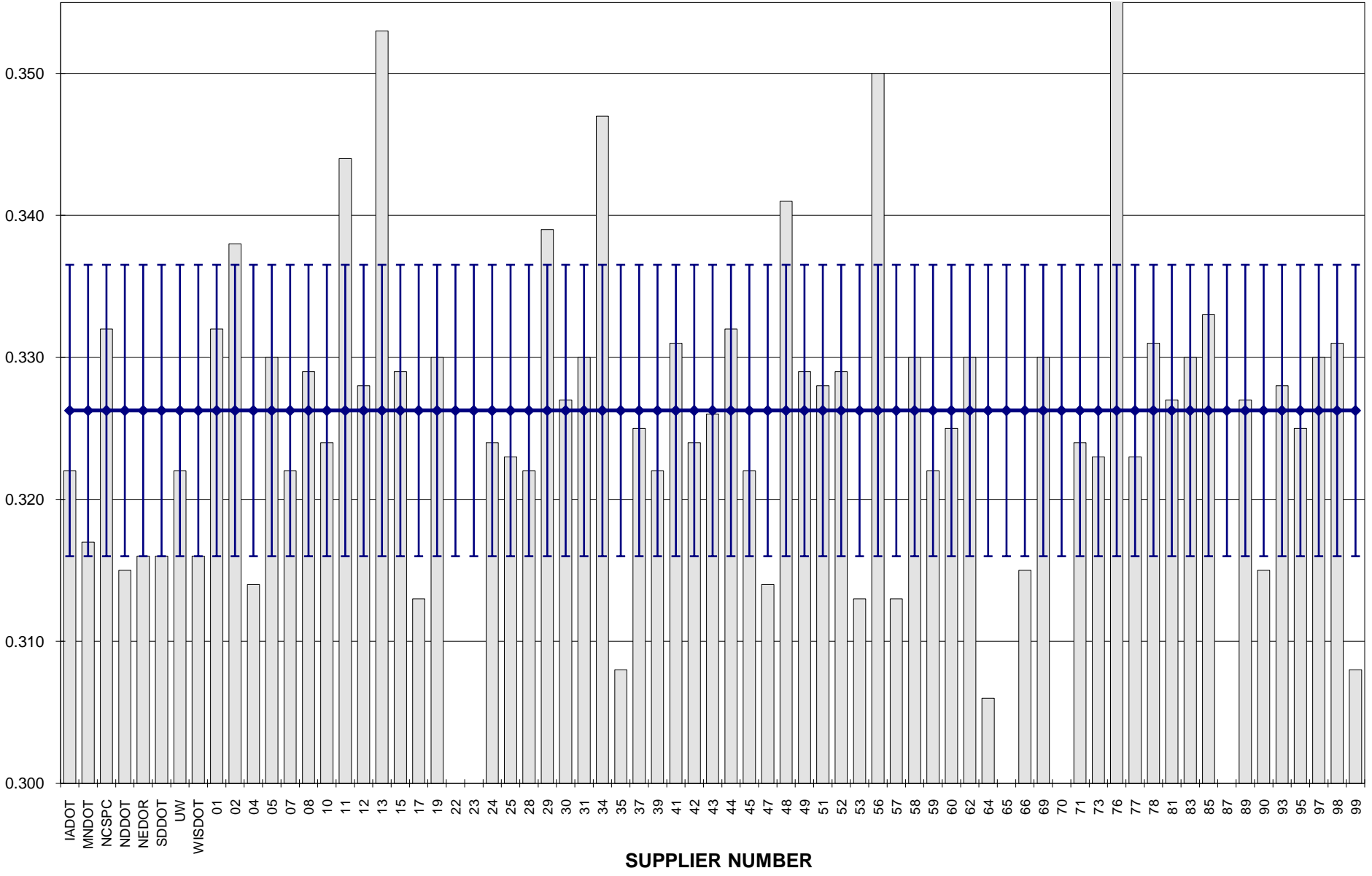
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BBR STIFFNESS



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**BBR m-VALUE**





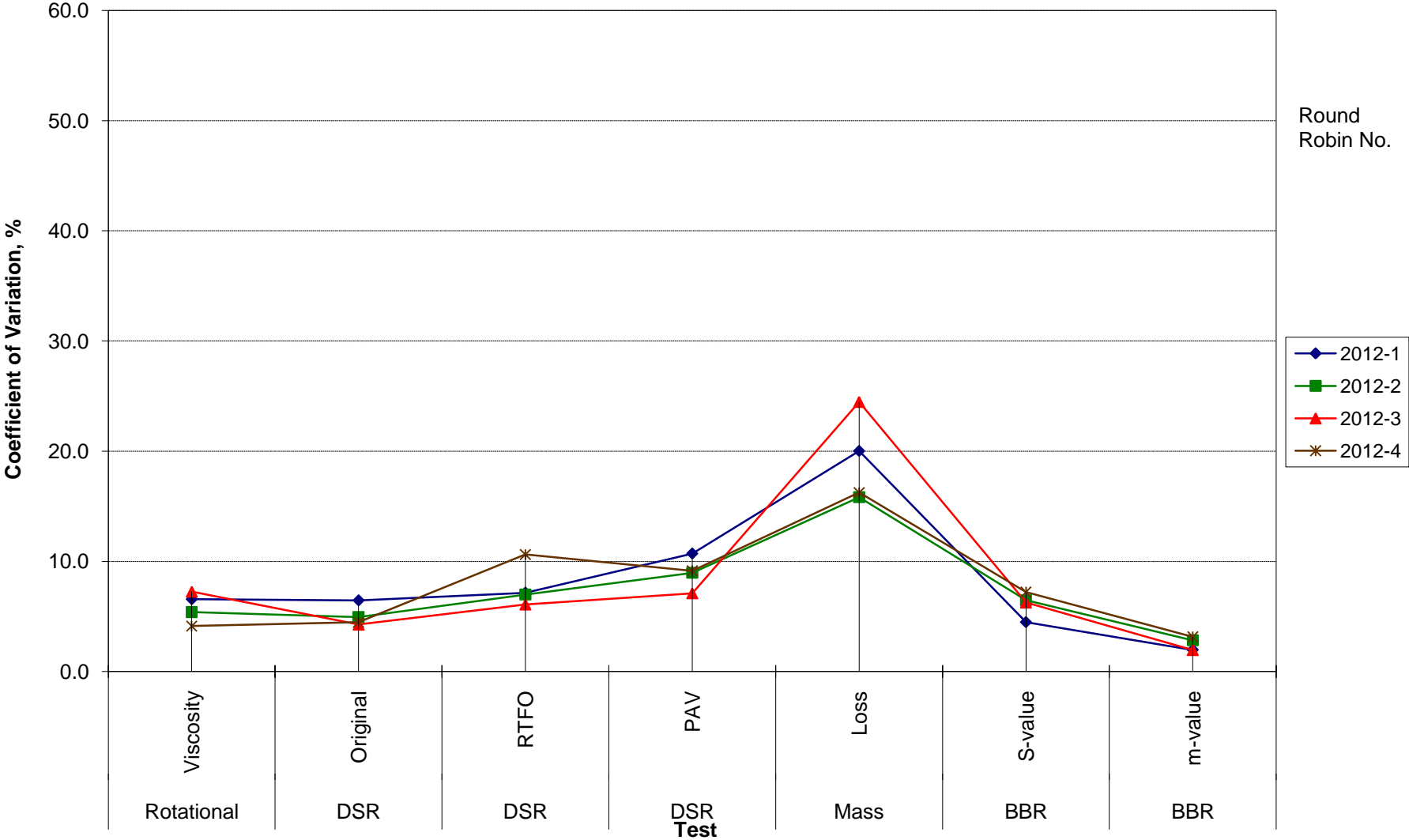
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**COEFFICIENT OF VARIATION**

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
2012-1	68	6.563	6.456	7.152	10.709	20.015	4.479	1.967	10.431
2012-2	70	5.394	4.948	6.994	8.968	15.831	6.470	2.840	18.415
2012-3	63	7.252	4.265	6.090	7.110	24.470	6.268	1.959	8.761
2012-4	66	4.127	4.488	10.623	9.143	16.247	7.210	3.146	10.823

**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-4  
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**COEFFICIENT OF VARIATION**



**COMBINED STATE BINDER GROUP ROUND ROBIN 2012-4  
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PG 64-22**

**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>	0.451	1.51	3.88	4,588	-0.241	234	0.326
<b>Std. Dev.</b>	0.0186	0.0677	0.3219	382.26	0.0367	16.86	0.0095
<b>Coef. of Var.</b>	4.127	4.488	8.301	8.331	15.205	7.210	2.912